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JOURNAL OF THE STATISTICAL SOCIETY,

MARCH, 1863.



*On the STATISTICS of TONNAGE during the FIRST DECADE under the
NAVIGATION LAW of 1849. By JOHN GLOVER, Esq., F.S.S.*

[Read before the Statistical Society, 17th June, 1862.]

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I.—Introduction.

IN 1849 the Legislature passed the Act 12 and 13 Vict., c. 29, commonly called the Navigation Laws Repeal Bill, but which may be more accurately described as the law which repealed sundry customs' regulations imposing higher duties on certain goods when imported in any other than British ships, or ships of the same country as the produce. No public clamour or interest urged the passing of this Bill. No torrent of public opinion, such as forced the corn law repeal, made this other and later repeal irresistible. The records of the time, however, show how hotly its passage through Parliament was contested; and that both as to its policy and results there was great difference of opinion. The origin of the measure was peculiar. To secure the speedy passage of an important public Bill through Parliament, it is not, generally speaking, enough to show that there are weighty abstract reasons why it should pass—such as that its principles had been already affirmed in some previous measure, the enactment of which had produced a sort of logical necessity for a further step in the same direction, in order to avoid the appearance of Parliamentary inconsistency. Parliament is not usually moved by appeals of this nature, either to its consistency or inconsistency, but wisely, as it seems to us, it clings to practical, rather than theoretical, necessities; and only accepts theoretical service after it has decided for manifest practical reasons to take some action. In the instance before us, however, its conduct was exceptional.

In 1849 there was no scarcity of tonnage either British or Foreign, nor the most remote prospect of such a calamity; but the Navigation Laws were then suddenly repealed because recent enactments had undermined their basis and left them only as an inconsistent legislative fact. Hence, when freedom of tonnage was once proposed as the natural corollary to freedom of trade, it could not be successfully opposed because the legislature was so deeply committed to the underlying principle; and hence also its enactment without the usual Parliamentary justification, and without such reservations as to the time and the mode and the rapidity with which its new principles should be applied. It could not be, however, that an interest so old and so extensive, and one which had so long enjoyed the protection of the State, should suddenly have this protection withdrawn, without great fear being entertained for the consequences. So natural is it for dependence to become ever more dependent, and to think of all its good as having come through the channel that is about to close. But the question has at last emerged from the stormy atmosphere of prediction into the calmer region of fact, and can now be examined in the completed statistics of a decade perhaps the most remarkable in the trading history of any country. Its stupendous facts could scarcely be believed but for the unimpeachable public statistics in which they lie recorded, and in which, strange to say, both the advocates and the opponents of the legislation of 1849 think that they find now a justification for what was done then. In the greatly increased tonnage supply the advocates of the measure find their justification, seeing how largely it was required by the trade of the decade; while on the other hand the opponents find their justification in the unprecedented increase of foreign tonnage in the trade of the United Kingdom; in the continued refusal of the same liberty of tonnage to our flag by many foreign states, and in the cheapening of freight so far below remunerative prices as to have occasioned the necessity for a Parliamentary inquiry on the subject, and to have left the British shipping interest in a condition of great depression at the end of the most brilliant decade of British trade, a period which should have been equally favourable for British tonnage. The increase of foreign tonnage, as we shall see, far exceeded what either the most ardent advocate or the most violent opponent of the measure could ever have imagined, and has now a complete statistical verification. For this vast increase of tonnage, the increasing trade always provided a market, though of what sort these figures do not show.* In most cases of great trade development the national gain has quickly

* A demonstration could be obtained only by an examination of the freight statistics for the decade; but an accurate impression of the unprofitable nature of shipping business during its latter years, may be gained from the evidence given before the Select Committee, and from their report.

re-acted upon the loss sustained by particular interests through legislative changes, and made these interests stronger through the suffering they have endured: and if such a result has not accrued in this case in spite of the enormous development that has occurred since the change in the law, we submit that it may be wise to ask whether, while right in its abstract principle, the legislation of 1849 was equally right in the time, and the rate, and the mode of its application.

In selecting for review the period 1850-60,—the first year is chosen as furnishing an exact representation of the position of our shipping when the new law came into operation—and the last year—as being sufficiently distant to show in sharp contrast whatever changes the law had produced. I have only to add before proceeding to consider the figures, that there are three points from which the tonnage question is regarded, viz.,—that of the shipowners,—that of the consumers,—and that of the nation. Just conclusions are most likely to be attained by observation of the following figures from all these different stand-points—not from any one of the three.

II.—*Comparisons of Total Entries and Clearances.*

The first table to which I invite attention is for the purpose of making an absolute comparison between the totals of 1850 and those of 1860.

TABLE I.—*Showing the Total Amount of Tonnage Entered and Cleared in 1850 and 1860 with Cargoes and Ballast.*

	Tons.
1850	14,505,064
'60	24,689,292
Increase, tons	10,184,228
„ per cent.	70·21
„ „ between 1840-50	53·67
„ „ „ '30-40	62·76
„ „ „ '20-30	9·89

It will be readily acknowledged that an increase of more than 70 per cent. in ten years in our total tonnage movement is suggestive of questions numerous enough to justify the inquiry on which we are now entering. This will, however, be still more apparent when we now show by Table II that the increase of tonnage actually employed was 73·35 per cent.

TABLE II.—Showing the Total Amount of Tonnage Entered and Cleared in 1850 and 1860 with Cargoes only.

	Tons.
1850	12,020,674
'60	20,837,918
Increase	8,817,244
„ per cent.	73·35

The increase with cargoes only, being greater than that with cargoes and ballast, it follows that there was more constancy in the tonnage demand both outward and homeward, and that in proportion to the total increase, fewer vessels had to make voyages in ballast, seeking for cargoes to carry.

This increase of 73 per cent. in the decade 1850-60, is so large and satisfactory, that at first sight it might seem needless to ask any further questions. It is indeed a grand march of millions—advancing from *five millions* in 1830, to *nine millions* in 1840, then to *fourteen millions* in 1850, and in 1860 attaining the wonderful climax of *twenty-four millions*. But besides gross totals the records tell us of what flags and in what proportions these totals are composed, and in so vast a development, especially as it occurred under a new law, the important question immediately arises—has the development been general and equal?

III.—British Tonnage Comparisons.

We therefore proceed to a second comparison, showing the amount of British tonnage in 1850, compared with the same in 1860:—

TABLE III.—Showing the Amount of British Tonnage Entered and Cleared in 1850 and 1860, with Cargoes only, and with Cargoes and Ballast.

	With Cargoes only.	With Cargoes and Ballast.
	Tons.	Tons.
1850	8,039,308	9,442,544
'60	12,119,454	13,914,923
Increase	4,080,146	4,472,379
„ per cent.	50·75	47·36
„ „ between 1850-40	—	45·48
„ „ „ 40-50	—	51·65
1830-20	—	A small decrease.

From Table III, it appears that the increase of British tonnage entered and cleared with cargoes during the decade, was 50·75 per cent., and including ballast vessels in the comparison 47·36 per cent.

The rate of increase during the previous decade having been 45·48 per cent., it must be considered that this is satisfactory; largely to increase during three decades, and to sustain the rate of increase on the ever enlarging area, indicates marvellous activity and life.

There is, however, another analysis of the British entries and clearances, which should be specially mentioned, viz., that of steam tonnage.

TABLE IV.—Showing the Amount of Steam Tonnage Entered and Cleared in 1850 and 1860.

	Tons.
1850	2,209,847
'60	4,967,573
Increase	2,757,726
„ per cent.	124·80

All this, however, is not strictly trade increase. Postal subsidies exercise, without doubt, an important influence on these figures; yet the fact remains—subject only to some qualification on this account—that while Table III shows so large a general increase as 50·75 per cent., Table IV shows that in the special item of steam tonnage on which all the near trades are ever becoming more dependent, the increase was no less than 124·80 per cent.

The amount of shipping built in any particular year, does not furnish certain data from which to test in an inquiry like this, for it may be greatly impeded by strikes, or greatly stimulated by unusual cheapness of material and labour. Table V, however, shows the comparison between 1850 and 1860 in this respect, distinguishing steamers from sailing vessels.

TABLE V.—Showing the Number, Tonnage, and Average Size of Sailing and Steam Vessels Built in 1850 and 1860.

	Sailing Vessels.			Steam Vessels.		
	Number.	Average Size.	Tons.	Number.	Average Size.	Tons.
1850	621	191	119,111	68	214	14,584
'60	818	193	158,172	198	271	53,796
Increase	197	2	39,061	130	57	39,212
„ per cent.	31	1	32	191	26	270

The value to be attached to the results of Table V, will be better appreciated after we have shown by Table VI, the registered amount of British tonnage in 1850 and 1860, and in previous decades:—

TABLE VI.—Showing the Number of Vessels, their Average Size, and Total Registered Tonnage of the United Kingdom and Channel Islands; also the Increase in each Decade from 1810 to 1860, and the degree of Activity in each Decade.

Year.	Number of Vessels Registered.	Average Size.	Total Tons.	Increase per Cent. in Tonnage.	Degree of Activity.
1810	20,253	109	2,210,661	—	—
'20	21,969	110	2,431,029	9·97	1·84
'30	19,174	114	2,201,592	none	1·94
'40	21,983	123	2,724,107	23·78	2·38
'50	25,138	139	3,504,944	28·66	2·69
'60*	27,663	168	4,658,687	32·63	2·77

* The new mode of measuring ships which came into operation in 1855, has had the effect of making the increase in registered tonnage about 10 per cent. less than the ships since added to the register would have made it, had the former regulations for measurement continued in force to the end of the decade.

It will be observed that Table VI shows that in 1860 compared with 1850, the number of ships was greater, the average size larger, and the degree of activity also greater. The decade 1840-50, exhibits results highly satisfactory both as to increase in number and average size, as well as in activity—results which justify our previous statement, that the Act of 1849 was passed in deference to the abstractions it embodied rather than to any famine of tonnage for which the Act was to provide a remedy; but satisfactory as that decade was, and large as the figures of its increase are, those of the decade 1850-60 surpass it,—and that too precisely in the particulars which most indicate tonnage prosperity,—for it will be observed that whereas the number of ships added to the register in 1840-50 was 3,155, in 1850-60 it was only 2,525; the gain of tonnage which was 780,837 tons in 1840-50 on 3,155 vessels, was 1,153,743 tons in 1850-60 on 2,525 vessels; the decrease in the number of vessels was 630, but on this decreased number of vessels, there was a gain of 372,906 tons of carrying power. The third column shows that from 1810 to 1830, very little progress was made in the size of vessels, but thenceforward rapidly, and in the last decade with a ratio double that of any previous period, the average size of our ships has been increasing. The inferences from increasing size are all favourable, viz.:—

1. That employment for tonnage is more steady and concentrated; and that it is to be had in larger bulks.

2. That freight will be thus cheapened in the most satisfactory manner, goods being carried in larger bulks, at less cost to the

consumer, and with more profit to the carrier, so benefiting both parties.

On the fourth and fifth columns of Table VI it is only necessary to add, that from 1810 to 1830, we actually decreased both in the number and tonnage of our ships; but that from 1830 onwards, every decade has witnessed a large increase, the last being the largest of all. It would hardly have been surprising if, after such an augmentation as 28 per cent. in 1840-50, there had been some reaction, but instead of that, 1860 shows both an absolute and relative increase over the unprecedented figures of 1850. The last column of this table indicates the degree in which our registered tonnage was active, by the ratio which it sustains to the total amount of British tonnage entered and cleared. This increased activity is another circumstance by which freight has been cheapened, and both the consumer and shipowner benefited. Neither the time occupied in sailing on any given voyage, nor the time occupied in seeking and finding, in loading and discharging cargoes, nor in idle intervals between voyages, nor in snugly lying up during the more stormy months of winter,—none of these occupy so much time as formerly, and hence, as the last column in this table shows, an ever increasing rate of activity. The whole increase shown, however, is not attributable to these causes. Steamers contribute largely to it, though in considering the influence of steamers on this figure, it must be recollected that a great many of the largest steamers owned and registered here, are not in our ports for years, and do not leave any mark of their movements on the tonnage statistics of the United Kingdom.

TABLE VII.—*Showing in what proportions the Tonnage of the United Kingdom is Vessels, the Number of Men Employed, and distinguishing Sailing Vessels from*

	Sailing Vessels.					Steam Vessels.	
	Number of Vessels.	Tonnage.	Average Tonnage.	Men Employed.	Number of Men to each 100 Tons.	Number of Vessels.	Tonnage.
Home trade { 1850.... { 1860....	8,830 10,848	666,957 821,079	75 75	38,527 39,163	5·7 4·7	320 402	54,196 92,254
Increase	2,018	154,122	none	636	1·0 Decrease	82	38,058
,, per cent. ...	22·	23·	none	1·6	17· Decrease	25·	70·
Foreign trade { 1850.... { 1860....	7,149 6,876	2,143,234 2,804,610	299 407	93,912 97,624	4·3 3·4	86 447	45,186 277,437
	273 Decrease	661,376 Increase	108 Increase	3,712 Increase	·9 Decrease	361 Increase	232,251 Increase
Increase per cent. ...	—	30·	36·	3·9	20· Decrease	419·	515·
Total, including ships occupied in home and foreign trade { 1850.... { 1860....	17,466 19,090	3,032,532 3,852,245	178 202	142,730 145,487	4·6 3·7	426 929	104,680 399,494
Increase	1,624	819,713	24	2,757	·9 Decrease	503	294,814
,, per cent. ...	9·	27·	13·	1·8	19· Decrease	118·	282·

Some of the results of Table VII are very singular. It appears that in the home trade 2,018 sailing vessels are added to the number employed; no increase in the average size took place, but 23 per cent. increase in the tonnage employed must be considered satisfactory. It is remarkable, however, that 666,957 tons in 1850 required 38,527 men, and that 821,079 tons in 1860—an increase of 154,122 tons—should be navigated with so small an increase of men as 636. The decrease in the decade of the number of men employed, is exactly one man per 100 tons, equal to 17 per cent. In the foreign trade, the number of sailing vessels actually decreased 273. But in spite of this decrease in the number of vessels, the sailing tonnage in the foreign trade increased 30 per cent., a greater increase in tonnage than the 2,018 additional ships in the home trade added to the amount employed therein, that being 23 per cent., this 30 per cent. Hence the large increase in the average size of vessels employed in the foreign trade, viz., from 299 to 407 tons, an increase of 38 per cent. The economizing of labour has here

occupied in Home Trade and Foreign Trade; also the Average Tonnage of the Steamers.

Steam Vessels.			Total.			
Average Tonnage.	Men.	Number of Men to each 100 Tons.	Vessels.	Tonnage.	Men.	
169	4,491	8.2	9,150	721,153	43,018	1850 } Home trade
229	6,416	6.9	11,250	913,333	45,579	1860 }
60	1,925	1.3 Decrease	2,100	192,180	2,561	Increase
36.	43.	15. Decrease	23.	26.	5.8	,, per cent.
525	3,813	8.4	7,235	2,188,420	97,725	1850 } Foreign trade
620	17,958	6.4	7,323	3,082,047	115,582	1860 }
95 Increase	14,145 Increase	2. Decrease	88 Increase	893,627 Increase	17,857 Increase	
18.	371.	23.8 Decrease	1.2	40.	18.	Increase per cent.
245	8,700	8.3	17,892	3,137,212	151,430	1850 } Total, including ships occupied in home and foreign trade
430	26,105	6.5	20,019	4,251,739	171,592	1860 }
185	17,405	1.8 Decrease	2,127	1,114,527	20,162	Increase
75.	200.	21. Decrease	11.	35.	13.	,, per cent.

also made most satisfactory progress, viz., from 4·3 per 100 tons in 1850, to 3·4 in 1860, being a reduction of 20 per cent., against the reduction of 17 per cent. in the home trade. On the total comparison between sailing vessels in 1850-60, the only observation we make is the contrast shown between the large addition to carrying power, and the small increase of labour by which it is worked,—nearly 900,000 tons of shipping added, and only 2,757 men,—an increase of 27 per cent. to the tonnage, but with less than 2 per cent. increase in the number of men employed.

The changes in steam tonnage employed during the decade, as shown by Table VII, are very remarkable. In the home trade 25 per cent. added to the number, 70 per cent. added to the tonnage, 36 per cent. added to the average size, 43 per cent. added to the total number of men employed, and a reduction of 15 per cent. in the number of men per 100 tons. The extension of steam tonnage in the foreign trade is marvellous; only 86 steamers in 1850, 447 in 1860, an increase of 419 per cent. in number, 515 per cent. in

tonnage, 18 per cent. in average size, 371 per cent. in the number of men employed, and a reduction of 23·8 per cent. in the number of men per 100 tons—8·4 in 1850 against 6·4 per 100 tons in 1860. Comparing the total steam result of the decade with the total result in sailing tonnage, the contrast stands thus:—

	Per Cent.
Sailing vessels increased	9
Steam "	118
Sailing tonnage increased	27
Steam "	282
Sailing vessels increased in average size	13
Steam "	75
Sailing vessels furnished employment for additional men to the extent of	1·8
Steam vessels furnished employment for additional men to the extent of	200
Sailing vessels decreased the number of men per 100 tons	19
Steam "	21

Two things must be recollected with the above comparison; 1. That the area of the rates per cent. on steam tonnage is very small compared with that on sailing tonnage; and 2. That it is quite possible this steam progress may have been too rapid. The more humble looking figures of sailing tonnage, not enhanced by any "Great Easterns," indicate, perhaps, less zeal and more discretion; yet show such ample provision for trade, such improvement in average size and such economy in labour, as entitle the decade to be most conspicuously marked in the annals of British shipping.

Leaving the distinctions between home and foreign trade, also those between sailing and steam tonnage, the total result of the decade appears to be, that in the United Kingdom trade, there were employed under the British flag in 1860, compared with 1850, 11 per cent. more ships, 35 per cent. more tonnage, and 13 per cent. (or 20,162) more men. It is said that our shipowners are "a grumbling class," which is probably true, considering that they are Englishmen, and that all Englishmen grumble; but these figures show very conclusively, we submit, that grumbling was not their sole occupation during the last decade; that while grumbling, for some good reasons, against the Legislature, they addressed themselves vigorously to the new state of things introduced by the Act of 1849, and with energy equalled only by their successful economical appliances, they contributed their full share towards the supply of that great demand for tonnage which began the decade at *fourteen millions*, and ended it at *twenty-four millions*.

IV.—Foreign Tonnage Comparisons.

We now come to the statistics of foreign tonnage, which we proposed to examine. It will have been observed, that all the compari-

sons made thus far have been absolute comparisons; only the same thing compared with itself at a subsequent period—these are not usually considered "odious comparisons." But now we have to institute some relative comparisons which were considered by British shipowners very odious, and on the facts of which much complaint was made to the Legislature, not always in the wisest shape, but with only too much justification in the actual financial condition of British shipping towards the end of the decade.

Perhaps it will enable us to make a more easy and correct appreciation of these relative comparisons if, before instituting them, we examine the extent of foreign tonnage visiting our ports in 1850, and its absolute progress to 1860, and compare this with the progress of previous decades.

TABLE VIII. — Showing the Tonnage of Foreign Vessels Entered and Cleared with Cargoes and Ballast for each Decade, from 1820 to 1860; also the Increase per Cent., the Proportion per Cent. to Total, and the Proportion per Cent. to British.

Year.	Tons.	Increase.	Increase per Cent.	Proportion to Total Tonnage Entered and Cleared.	Proportion to British.
1820	799,392	—	—	15·14	17·84
'30	1,517,196	717,804	89·23	26·15	34·40
'40	2,949,182	1,421,986	93·67	31·24	45·42
'50	5,062,520	2,113,338	71·61	34·89	53·61
'60	10,774,369	5,711,849	112·82	43·63	79·58

The above figures relate to entries and clearances both with cargoes and ballast. Comparing the result between 1850 and 1860, with cargoes only, the figures are:—

1850	3,981,366
'60	8,718,464
	<u>4,737,098</u> or 118·99 increase per cent.

It is quite evident from Table VIII, that it is not solely due to the Act of 1849 that 43 per cent. of the total entries and clearances in 1860 were foreign vessels. Under the old reciprocity treaties, foreign tonnage in our trade from 1820 to 1850 had made gigantic strides. The absolute increase was 89 per cent. for the decade ending 1830; 93 per cent. for the decade ending 1840; but for the decade immediately preceding the repeal of the navigation laws only 71 per cent. So in like manner its proportion to the total entries and clearances doubled between 1820 and 1840; and its proportion

to British, in the decades from 1820 to 1850, rose from 17 per cent. to 34, then to 45, and in 1850 had reached 53 per cent. These figures and observations show that the law of 1849 was not enacted to admit that which had hitherto been excluded; but what a stimulus the permission to enter into any of our indirect trades, that Act gave to foreign tonnage, is shown by the extent to which the figures of the decade 1850-60 surpass all those which preceded. The 5,063,520 in 1850, became more than 10,774,369 in 1860, an increase of nearly 113 per cent. The proportion to total increased from 34 in 1850, to 43 in 1860; and the proportion to British rose from 53 to 79. Excluding ballast entries and clearances for the 1850-60 decade, the increase is from nearly 3,900,000 tons, to 8,700,000 tons, or 118.99 per cent. Certainly the framers of the Act of 1849 could not have expected an increase of foreign tonnage so vast as this, nor did its opponents venture to predict that the total increase of 71.61 per cent. of the 1840-50 decade, would, under the new law, be succeeded by an increase with cargoes only of 118.99 per cent. in 1850-60. It is also highly significant of the use made by foreign tonnage of the liberty of indirect trade given by the law of 1849, that the increase with cargoes only is greater than with ballast and cargoes. Against the foreign total increase of 112.82 per cent., that with cargo only is 118.99 per cent. Under the direct trade limitations, a large proportion of the foreign tonnage that came to our ports, discharged the cargoes of their own country's produce, and sailed away in ballast; but now they are able to take cargoes for other countries, if their own country cannot buy our goods. This facility of getting employment here, increases the attraction to come here, and in the exact degree in which it does so, tends to cheapen freight. These figures in Table VIII moreover, furnish us with some idea of what the increase in foreign tonnage would have been, had the navigation laws not been repealed. Recollecting that during the decade 1840-50, the increase was two millions of tons, and that the large grain imports of the decade 1850-60, as well as the war with Russia, greatly increased the demand for foreign vessels, recollecting also the large increase in our foreign trade generally, we estimate that 1860 would have seen the foreign entries and clearances increased to about 9,000,000 tons had the navigation laws not been repealed, so that the surplus beyond that quantity, viz., 1,774,369 tons, probably represents the amount that would not have been in competition in or for our markets, but for that Act.

By the following table we shall compare foreign tonnage in 1850 with British tonnage in 1850, and then by an examination of the same facts for 1860, we shall ascertain what precise changes in the relation of the one to the other were accomplished during the first decade under the new law.

TABLE IX showing the Relative Position of Foreign and British Tonnage in 1850 and 1860.

With Cargoes and Ballast.

(000's omitted.)

	1850.				1860.			
	Entered.	Proportion to Total.	Cleared.	Proportion to Total.	Entered.	Proportion to Total.	Cleared.	Proportion to Total.
British	4,700,	66.19	4,742,	63.51	6,889,	56.19	7,025,	56
Foreign	2,400,	33.81	2,662,	36.49	5,283,	43.81	5,490,	44
	7,100,	100.0	7,404,	100.0	12,172,	100.0	12,516,	100

With Cargoes only.

	1850.				1860.			
	Entered.	Proportion to Total.	Cleared.	Proportion to Total.	Entered.	Proportion to Total.	Cleared.	Proportion to Total.
British	4,078,	66.71	3,960,	66.10	5,760,	57	6,358,	58.90
Foreign	2,035,	33.29	1,946,	33.90	4,294,	43	4,424,	41.10
	6,113,	100.0	5,906,	100.0	10,054,	100	10,782,	100.0

From Table IX we have the following results:—

1. British tonnage was 66.19 per cent. of the total entries inwards in 1850, and fell to 56.19 per cent. in 1860.
2. Foreign tonnage was 33.81 per cent. of the total entries in 1850, and increased to 43.81 per cent. in 1860.
3. Of the total clearances in 1850, British tonnage occupied 63.51 per cent., and in 1860 56 per cent.
4. Of the total clearances in 1850, foreign tonnage occupied 36.49 per cent., and in 1860 44 per cent.

With cargoes only the results are shown rather less unfavourably to British tonnage, viz.:—

1. Of the entries with cargo in 1850, British tonnage occupied 66.71, and in 1860 57 per cent.
2. Of the same in 1850, foreign tonnage occupied 33.29, and in 1860 43 per cent.
3. Of the clearances with cargo in 1850, British tonnage occupied 66.10 per cent., and in 1860 58.90 per cent.
4. Of the same, foreign tonnage occupied in 1850 33.90 per cent., and in 1860 41.10 per cent.

It is interesting to know under what flags, and in what degree under each flag so large an increase of foreign tonnage has occurred. This is shown by Table X.

TABLE X.—Showing the Increase of Tonnage under each Flag between 1850 and 1860. Vessels with Cargoes only.

Nationality of Vessels.	Tonnage Entered and Cleared, 1850.	Tonnage Entered and Cleared, 1860.	Increase.	Increase per Cent.
Russian	163,254	242,673	79,419	48
Swedish	125,649	366,740	241,091	191
Norwegian	331,664	948,212	616,548	191
Danish	285,263	618,681	333,418	116
Prussian	404,401	774,678	370,278	91
Other German States	465,587	1,247,571	781,984	167
Holland	240,444	539,055	298,611	124
Belgian	71,775	131,424	59,649	83
French	369,624	880,352	520,728	140
Spanish	46,328	133,211	86,883	186
Portuguese	19,096	70,077	50,981	263
Italian	195,208	295,635	100,427	51
Other European States } chiefly Austrian	43,160	370,890	323,730	751
United States	1,215,225	2,834,021	1,618,796	133

These are surprising figures. Russia, whose mercantile marine was said to have been entirely destroyed during the war, seems to have reconstructed fast enough to place nearly a quarter of a million tons in our ports during 1860—48 per cent. more than in 1850. Sweden and Norway each add 191 per cent., together an addition of 850,000 tons. Germany increases more than three-quarters of a million—167 per cent.; Holland 124 per cent. Under the heading of other European States, Austria rises from next to nothing in 1850, to more than 300,000 tons, or 751 per cent., nearly the whole of which is in indirect trade, chiefly with Southern Russia. America brings up the rear, making an addition of nearly one million tons above the large increase of Norway—1,618,796 tons, 133 per cent. Of the fourteen flags, only four failed in at least doubling themselves.

V.—Observations on Foreign Tonnage Comparisons.

No marvel that the decade in which this increase happened, is considered a remarkable one. It must be recollected, however, that these figures do not indicate whether profit or loss was the result of these large operations, although the natural inference is that increase means success. Increase, however, may come through other than trade causes, temporary and exceptional in their nature, fiery and urgent while they last, and ensuring a terrible reaction when they

are over. The British increase, however, was not greater than the increase in the total tonnage movement warranted; and moreover was not much above its rate of increase in previous decades; but we are compelled to mark the foreign increase as unnatural, both in cause and extent. Such a change in the law as was made in 1849 could only furnish increased employment for foreign tonnage by the gradual growth of trade, or by the displacement of the national flag. But the Act of 1849 had such an effect on the production of foreign tonnage throughout all the maritime countries in Europe, that foreign ships for British trade were built in prodigious numbers. The result of this was not immediately felt however. The Californian and Australian gold discoveries increased trade, the Russian war, as already mentioned, occasioned a vast demand both for our vessels as transports, and for foreign vessels as neutral traders; hence the unfavourable effect of this great increase of foreign tonnage was not experienced in the earlier years of the decade. But in its later years, when tonnage had to depend more on ordinary trade for employment, the disadvantage of so vast an increase was fully realised. If our estimate be at all near the mark, that the Act of 1849 made the increase in the decade about 1,700,000 tons more than the expansion of our trade required, this is enough to explain the distressed condition in which the national tonnage found itself, and to confirm the representations which its largest and most respectable owners made to the Parliamentary committee. For such a surplus over the natural supply, and beyond the ordinary trade demands, is just enough to create that preponderance of supply over demand which makes the buyer master of the situation, and excludes all consideration of cost and profit from the selling price. That was precisely the case in the later years of the decade, and as the most proximate cause of bad freight markets was this indiscriminate increase of foreign tonnage under the Act of 1849, loud complaints were made against its operation, and with many other requests, it was especially demanded of the Legislature that the non-reciprocating States should have the retaliatory clauses of that Act put in force against them. But the Legislature had opened a door which it was impossible to shut, and we must acknowledge that had it been easy to put these retaliatory clauses in force, doing so would have been fruitless, so far as any appreciable effect on freight was concerned, unless we had decided to reject the United States definition of "coasting trade," and to have included her flag with those whose liberty of equal entry to our ports was to be cancelled. The other non-reciprocating powers are unworthy of notice as competitors, their exclusion consequently would not have appreciably reduced the supply of tonnage, nor have made bad freights better. Others said, and with much reason too, that in exposing British tonnage to this unrestricted, and in many cases

unreciprocated competition, without *first* liberating it from all the special burdens and disabilities which had resulted from its previously protected state, and somewhat also from the relation which the mercantile marine had always borne to the Royal Navy and the exigencies of national defence—the Legislature had applied free trade principles to shipping in the wrong order, that it should have been made free at home first, *then* exposed to as much competition as either tonnage wants, or abstract principles, or willingness on the part of other nations to reciprocate, rendered wise or expedient. But while still treated as a protected interest at home, by endless restrictions, imposts and liabilities, it was exposed to competition with foreign tonnage which neither was under these burdens nor would, in many cases, reciprocate the liberty of trade which the Act of 1849 conferred. We submit that so dealing with an old and long protected interest in deference to political abstractions, and in the absence of any manifest practical urgency, was unjust both to the special interest and to the abstract principle. For it can hardly be doubted now, that if free trade principles had been first applied at home—where all kinds of charity should begin, and perhaps free trade is the highest form of national charity—in liberating shipping from its antiquated burdens, such an application of the doctrines would have been a fitting preparation for this competition, and have made the shipowning class free traders; then as the sequence of such legislation, a permissive statute granting to any nations that would reciprocate, equality of entrance to our own *liberated ports*, would have constituted an irresistible appeal to all maritime nations to concede to us what our ambassadors and plenipotentiaries have ever since vainly supplicated in France and Spain, in Portugal and Belgium, and with most reason, though perhaps with least success, in the United States of America. But zeal for the rapid application of these just triumphant doctrines, rather than discretion in the order and rate of their application, seems to have characterized the legislation of 1849: hence a decade following of great manifested capacity on the part of our shipping interest, bravely trying to hold its own, but ending in bitter lamentations to the Legislature and vast pecuniary loss; hence also British shipping being obliged to suffer at the same time both the burdens of protection and the competition of free trade, receiving from both the harm they could each do, receiving from neither the good which either by itself might have done; hence, worst of all, the throwing away of an opportunity so golden, an appeal so irresistible, that rightly used might, ere this, have secured freedom of navigation and equality of maritime rights for every flag, in every harbour, and on every sea!

VI.—*Conclusions.*

The following conclusions seem to be indicated by the figures and facts of the decade to which attention has been directed:—

1. That the increase of British trade fully justified the increase of British tonnage which occurred during the decade, so that the depression during its last years cannot be charged to over-production of tonnage on the part of British shipowners.

2. That the increased size of British ships, the increasing economy of labour in their navigation, the greater rapidity in their movements, their increased carrying capacity, and especially the great development of steam tonnage, all show that the obvious means whereby freight might be cheapened with advantage to both carrier and consumer, have been diligently and successfully followed by the British shipowner.

3. That the foreign tonnage increase was exorbitant; not based on trade demand, but on political expectations.

4. That the inevitable effects of this excessive increase of foreign tonnage were counteracted during the first half of the decade by very exceptional demands for tonnage, but became manifest immediately on the cessation of these extraordinary demands.

5. That the power of increase manifested by British tonnage during the decade, and the increase that would have occurred in foreign tonnage under the old reciprocity treaties, had the Act of 1849 not been passed, alike prove that there was no urgent public necessity for such summary and hasty application to shipping of the unquestionably sound principles of free trade; but that time might have been taken, without any national sacrifice, to release shipping from its home burdens, and to negotiate with foreign States for reciprocal concessions to our flag, preparatory to the general measure of tonnage liberation.

6. Lastly, that what ought to have been done prior to the repeal of the navigation laws, and is not yet done, ought not to be longer delayed. We especially refer to the abolition of compulsory pilotage, of light dues, of the ballast monopolies, of stamp duties, and to the oppressive liabilities *imposed on British shipowners alone* in the Passenger Acts.

These conclusions would have been further confirmed had we been able to consider the prices of freight, the rate of sailors' wages, the cost of provisions, also of such articles as rope, canvas, copper, &c., all of which largely affect the profitableness or otherwise of maritime adventure during any given time. In the limits of this paper, however, it was not possible to produce statistics on these questions. But for the singularly striking circumstance of a decade in which the employment for shipping increased *ten million tons*,

ending in such general depression and loss, we think the figures adduced do furnish a "reason why."

With respect to pilotage regulations, light dues, ballast, &c., great changes have been recommended to Parliament in the report of the Select Committee presented in August, 1860, and for the most part still wait for legislative sanction.* Both by his wrongs and by his rights, the shipowner thinks himself entitled to these reforms. They, too, are natural corollaries of the free trade principles, and having suffered all the injury which a very hasty application of these principles could inflict, the benefits and exemptions which a further application of the same principles would secure are looked for as rights. And we submit, that the importance of the interest as shown by its own figures for 1860, and the increasing severity of the foreign competition as also shown, alike suggest that this home application of the doctrines of free trade ought not to be, and without injustice, cannot be, longer delayed. Anything like a real decrease in our maritime strength would be accepted everywhere as the symbol of national decline, and no possible concessions would be then esteemed too dear to check and avert such a calamity. Is it not better, *now*, to concede to maritime strength what *then* would be so gladly conceded to approaching weakness? and so, not only preserve our present maritime position, but enable this great national interest, strengthened in and through its sufferings, to retain the proud supremacy of our flag!

* During last session of Parliament a Bill was passed containing clauses intended to effect the gradual abolition of compulsory pilotage.

ENDOWED EDUCATION, and OXFORD and CAMBRIDGE COLLEGE
FELLOWSHIPS. *By* JAMES HEYWOOD, M.A., F.R.S.

[Read before Section (F), of the British Association, at Cambridge,
October, 1862.]

NUMEROUS accounts of local charities are sent in, from time to time, to the Charity Commissioners of England and Wales. In 1860, there were 13,929 accounts of charities sent in to the Commissioners, and in 1861 the number of these accounts submitted to them increased to 17,594.

Direct relief in the administration of charities may be afforded by the Commissioners under the Charities Act of 1860, in all cases where the trustees apply to the Commission, and the charge in such cases is inconsiderable on the charity funds.

This facility of obtaining relief in the administration of charities, has occasioned a diminution of applications to judicial courts on the part of trustees of charities. In 1860 there were, in charity cases, under the Commission—

75	applications to the Court of Chancery
143	to county courts,
218	to judicial courts

Whilst in 1861 there were, in charity cases under the Commission, only—

32	applications to the Court of Chancery
7	to county courts
39	to judicial courts

Special applications are requisite to obtain the valuable aid of the Charity Commission, and the Commissioners do not possess the power to initiate proceedings in any charities whether connected with physical relief, or the formation of habits of industry and providence, or in charities which are available for educational purposes. It is not the custom of the Charity Commission to inquire into the nature and system of education in the charities under their control, with a view to the improvement of plans of public instruction.

A general digest of the value and purposes of charities, whose accounts have been submitted to the Commission, is in progress, in

which a summary of the information obtained for several counties and important districts will be arranged and condensed under the care of the Commissioners.

Some central authority possessing the power of periodically visiting and inspecting endowed educational institutions, would be of importance to determine the best means of improving educational endowments.

An extension of the powers of the Committee of Privy Council on Education, would facilitate such an inspection of endowed educational institutions, and the recent Royal Commission on Popular Education, under the presidency of the Duke of Newcastle, has reported in favour of a transference of the powers of the Charity Commission to the Committee of Privy Council on Education: the circumstance of the president of that committee being a peer, and the vice-president a member of the House of Commons, would secure ready access to each house of Parliament, in favour of maturely considered measures of amelioration.

Inspection of endowed grammar schools, under the care of the Committee of Council on Education, was particularly recommended by the Royal Commission on Popular Education, but the visitation of grammar schools alone does not provide a sufficient remedy for the unsatisfactory routine of education often kept up in those institutions.

When the British Association for the Advancement of Science met at Cheltenham some years ago, the writer of this paper asked the Rev. Dr. Dobson, head master of Cheltenham College if more science could not be introduced into the Cheltenham College system? In reply, the head master mentioned, that it was the general wish of the parents who sent boys to the college at Cheltenham, that their sons should have that instruction which would enable them to obtain scholarships and fellowships at Oxford and Cambridge. Dr. Dobson was of opinion that an alteration should first be made in the requirements for scholarships and fellowships, before changes could be effected in the public school system.

Since that time, competitive examinations for the Indian Civil Service, for the Engineers and Artillery at Woolwich, as well as for the Foreign Office, and for situations in foreign embassies, have given a new impulse to the study of modern languages and modern science.

A Royal Commission, presided over by the Earl of Clarendon, has been appointed to inquire into the state of the largest and most richly endowed English public schools.

A wide spread spirit of discontent is observable at the present day, with reference to the continuance of plans which in several cases limit public school education principally to Greek and Latin.

Sir Charles Lyell noticed in his evidence, presented to the Oxford

University Royal Commission, in 1850-1, that he was acquainted with a school containing seventy boys, in which five boys were annually prepared for either Oxford or Cambridge, and that the system of education for the remaining sixty-five boys was conducted in the same manner, principally on classical subjects, which the masters deemed expedient for the small minority intended to proceed to one or other of the ancient English universities. The attractions of the pecuniary rewards of scholarships, fellowships, &c., are so powerful, that, in fact, the subjects of examination for these emoluments control nearly the whole of the higher educational system of the country.

Lord Brougham, in recently addressing the members of the Scarborough Mechanics' Institute, observed, that when a great and renowned King of Sparta, Agesilaus, was asked "What ought boys' to be taught," he answered, "Teach them that which they are likely to find will be of most service to them when they are grown older."

College statutes at Oxford and Cambridge, have, under the university acts of Parliament of 1854 and 1856, been already in some degree revised, but the subjects of examination for scholarships and fellowships have been very seldom modified.

A long career of school and college education may be considered to terminate at 22 or 23 years of age, and a college fellowship of 200*l.* a-year, tenable for about ten years, may be regarded as the principal reward of successful scholastic study at that period of life.

Let us inquire into the subjects of examination, to prepare for which, the intellectual labours of probably fourteen years of youth have been devoted, and which are exemplified in the annual examination papers for the fellowships of Trinity College, Cambridge.

For five days the Trinity College fellowship examination is continued at Cambridge, and the examination papers in 1861 were given to the candidates in the following order:—

First Day.

9—12. Greek prose to be translated into English; passages from Plato, Lysias, Theophrastus, and Polybius.

1—4. Greek poetry, including passages from Homer, Euripides, Apollonius of Rhodes, to be translated into English prose, and some lines from the Greek anthology, to be rendered into English verse.

Second Day.

9—12½. Latin prose and Latin poetry, comprising passages from Cicero, Livy, Plautus, and Propertius to be translated into English.

Third Day.

9—1. Mathematical questions, in geometry, algebra, trigonometry, mechanics, dynamics, optics, hydrostatics, and astronomy.

2—4. A passage of English prose to be translated into Latin prose.

Fourth Day.

9—12. Logic, questions on the philosophy of Plato, Aristotle, and Cicero, the ancient and modern views of mental and moral philosophy, the writings of Locke on the human understanding, the sermons of Butler relating to human nature, the economical tenets of Paley, Bentham, Mill, &c., with questions on constitutional law, and on the meaning of words.

1—4. High mathematics, involving abstruse calculations and difficult investigations.

Fifth Day.

In the morning:

A passage of Latin prose to be translated into Greek prose.

A portion of English tragic poetry to be rendered into Greek iambs.

In the afternoon, 1—3:

Greek verses, from Epicharmus, to be translated into English.

Short Greek fragments to be translated.

Questions on Greek plays and the early Athenian constitution.

Greek epigrams, proverbs, and phrases to be translated.

Greek verses to be corrected.

Derivations and original meaning of numerous Latin terms.

Criticism of the military conduct of certain Roman military leaders in the second Punic war.

Constitutional changes in the Roman republic.

Roman views of their own relation towards Italy and the rest of the world, after the first and second Punic wars, and the second and third Macedonian wars.

Sketch required of Latin literature, from B.C. 253, to B.C. 153

Places of the following eight letters:—C, F, G, H, Q, X, Y, Z, in the Latin alphabet, to be accounted for.

Original identity of certain Latin and Greek words to be proved.

At Oxford, college fellowships are usually bestowed exclusively as the rewards of success in the classical examination for honours at the time of the bachelor of arts degree, and Latin composition is constantly required in all the colleges of Oxford. Students who obtain college scholarships, are expected to keep up their classical

reading, as undergraduates, and to become candidates for honours in Greek and Latin subjects on taking their B.A. degree.

The addition of a new general university examination, called "Moderations," at Oxford, has had the effect of introducing a fresh university test of classical acquirements in that ancient seat of learning for undergraduates.

Fortunately, the excessive devotion of time, for three consecutive years, at Oxford, to classical pursuits, is found inconvenient with reference to a suitable preparation of candidates for the ministry in the Church of England; and a desire is manifest to diminish the period of general studies to two years instead of three years at the ancient universities.

In July, 1862, a paper was read at the Church Congress in Oxford, by Dr. Ellicott, Bishop of Gloucester, recommending a reduction of the general course of reading for undergraduates at the ancient English universities, to two years.

The Bishop of Gloucester advised the institution of a theological examination for divinity students, at the end of the third year of academical residence, suggesting, in his proposal, a year of professional study after two years of preparation for the degree of Bachelor of Arts.

For a large majority of the students who are preparing for the ministry in the Church of England, such an arrangement would be highly advantageous, and it is already partially anticipated, as professional lectures on divinity are frequently attended in the third year of residence; and various subjects are set for the third year examinations, both in the colleges and for the ordinary B.A. degree in the university, which are similar to those required in the ordination examinations of the Church of England.

During the first two years of undergraduate residence at Oxford and Cambridge, secular and general subjects usually occupy the attention of students, with which the degree of Bachelor of Arts would be naturally connected.

A separate examination would become requisite for college fellowships, as the high amount of reading expected for the B.A. degree with honours, at the end of three years of study, could not under existing circumstances be expected at the end of two years.

College fellowship examinations govern, in a large measure, the whole system of higher endowed education in England and Wales. Schoolmasters are frequently selected for the largest grammar schools from the class of college fellows. When installed into the chair of office, it is their highest ambition that their pupils should succeed in obtaining college scholarships and fellowships at Oxford and Cambridge.

Years of preparation in the art of composing Latin and Greek

verses, and in turning English prose into either Greek or Latin, are usually requisite for success in classical fellowship examinations. We know, however, of one case, where a highly accomplished classical student at Trinity College, Cambridge, succeeded without Latin and Greek verses, in obtaining a fellowship. Mr. Edward H. Bunbury was advised by his tutor, that as he had not been educated at a public school, he could not compete with public school men in Greek and Latin versification, and that he would utilise his exertions by devoting himself to prose composition in the ancient languages of Greece and Rome. The advice so given, was followed, and led to a successful result.

Dean Peacock, formerly fellow and tutor of Trinity College, Cambridge, strenuously urged the abolition of exercises in Latin and Greek versification in academical examinations, on account of the time necessary to acquire the art of making verses in dead languages, and the speedy loss of facility in composing such verses, when the practice of writing them had ceased for some years.

In ordinary grammar schools, the art of good handwriting is often spoiled by an incessant scribbling of bad Latin and Greek verses. In the great school at Eton, some years ago there were only about 15 masters for 770 boys, or hardly 1 master for 50 boys, and the present proportion does not exceed 27 masters to 800 boys; this paucity of superintendence may perhaps be the result of the ancient system of exercises in the composition of Latin and Greek verses forming a large portion of the work assigned to the pupils, and occupying many hours of time for the boys, whilst verses require a comparatively short time for revision and correction by the masters.

An authorized inspection of the higher system of endowed education, can only be carried out by the Committee of Privy Council on Education, as the head of public instruction in this country; and an extension of the powers of that body, so as to include endowed educational institutions under their superintendence, would be of national importance.

Scientific professors are, in general, not sufficiently remunerated at Oxford and Cambridge, and as there are about 500 or 600 college fellowships in the two ancient universities, of which at least 50 or 60 fellowships become vacant every year; the transference of a larger portion of these emoluments when vacant, for the endowment of professorships in modern subjects, may be considered.

It is remarkable that one of the principal results of endowed education for young men, should be the maintenance of a system of composition in Greek and Latin verses, which is almost entirely useless, in the majority of instances, after the age of 22 or 23, and that education for young ladies, which has never received the patronizing assistance of rich endowments, should include in a well

managed school, instruction in the modern languages of French, German, and Italian, lessons in English grammar, and belles-lettres, as well as in the elegant accomplishments of music, singing, and drawing.

Let the counsel of the ancient Spartan monarch, recently reiterated by Lord Brougham, be followed in the system of endowed education, that the students may be taught what they are likely to find will be of most service to them when they arrive at a man's nature.

In the examinations for college fellowships at Oxford and Cambridge, exercises in the composition of Latin and Greek verses should no longer be set, and an alternative should be allowed between prose composition in Latin and Greek, and translations from English into French and German.

English history and English composition should be regarded, and science encouraged, by the bestowal of suitable collegiate rewards on their most distinguished votaries.

On the COTTON TRADE and MANUFACTURE, as affected by the CIVIL WAR in AMERICA. By LEONE LEVI, Esq., F.S.A., F.S.S., of Lincoln's Inn, Barrister-at-Law, Doctor of Economical and Political Sciences of the University of Tübingen, and Professor of the Principles and Practice of Commerce in King's College, London.

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No district of the United Kingdom exhibits more conspicuously the great phenomena of British industry, or the great secret of British wealth, than that which has become, alas, so prominent for its sufferings and privations. The theme suggested by this great hive of industry, may indeed engage our deepest thought and reflection. There coal and iron supersede turf and corn, which render the aspect of the country as dingy as the entrance of hades. Illumined factories with more windows than Italian palaces, and smoking chimneys taller than Egyptian obelisks constitute the glories of the district. Everywhere you find monuments of indomitable energy. All you see indicates the march of modern progress. Enter for a moment one of those numerous factories; behold the ranks of thousand operatives all steadily working; behold how every minute of time, every yard of space, every practised eye, every dexterous finger, every inventive mind, is at high-pressure service. There are no lumber attics nor lumber cellars; everything is cut out for its work and the work for it. And what could be more wonderful than those factories for the manufacture of machines. Listen to the deafening din. What power has mind over matter! What metamorphosis can human industry perform; and how much has this mighty agent changed the entire character of Lancashire. See how thickly it is filled with cities and towns. In Northumberland there are 208,000 square miles for each town. In Lancashire only 26,000. And how close the inhabitants. In Westmorland there are 19 square miles for each inhabitant. In Lancashire 0.97 only. One hundred years ago Manchester had only 1,600 inhabitants; now with Salford she has more than 450,000 people.* Three hundred years ago Liverpool was only a fishing hamlet with 138 inhabitants; now she has also 450,000. The entire county of Lancashire, in 1692, was returned for the

* The increase of population in the county of Lancaster was strikingly demonstrated in the last census for 1861. Except in the two mining counties of Durham and Monmouthshire, where the increase has been even greater, the rate of increase

land tax at a value of 97,000*l.*; in 1860 she was assessed to the property tax at a value of 11,500,000*l.* Whence this magic increase? Principally from the cotton trade and manufacture.

It is in Manchester, too, that the steam Hercules whose power dwarfs the fabled feats of the Grecian prodigy, first exhibited his youthful strength, grew up in vigour and skill, and still manifests his gigantic maturity. This system of industry is comparatively of modern creation—history throws but little light upon its nature, for it has scarcely begun to recognise its existence; and the philosophy of the schools supplies scarcely any help for estimating its results, because an innovating power of such immense force could never have been anticipated. The steam-engine had no precedent, the tall and ever-smoking chimneys had no parallel in times past, the spinning jenny is without ancestry, and the mule and power loom entered in no recognised heritage: There they are even in their present temporary prostration—an overflowing stream of opulence and power, a wonder to ourselves, the envy of the world.

in Lancashire during the last sixty years has been larger than in any other county in England.

Years.	Population.	Percentage increase between the Censuses.
1801	673,486	—
'11	829,499	22
'21	1,052,948	27
'31	1,330,854	27
'41	1,667,054	24
'51	2,031,236	22
'61	2,429,440	20
Total increase in } 60 years	—	261

Counties.	Rate of Increase in 60 Years.	Counties.	Rate of Increase in 60 Years.	Counties.	Rate of Increase in 60 Years.
Stafford	208	Worcester	110	Huntingdon	71
Surrey	210	Nottingham	109	Somerset	63
Middlesex	170	Northumberland	104	Berkshire	60
Warwick	172	Lincoln	98	Norfolk	59
Cheshire	163	Gloucester	94	Suffolk	57
West Riding, } Yorkshire,	164	Cornwall	92	Oxford	52
City of York	140	Cumberland	99	Buckingham	55
Kent	138	Leicester	83	North Riding, } York	54
Sussex	128	Essex	78	Westmorland	49
Southampton	120	Hertford	78	Salop	42
East Riding, York	116	Cumberland	75	Hereford	40
Bedford	113	Devonshire	72	Rutland	34
Derby	110	Northampton	73	Wilts	36
		Dorset	65		

Cotton* is not a new article. All warm climates, within a limited zone, especially those in the vicinity of the sea, produce cotton. From time immemorial cotton has been grown in Hindoostan, China, Persia, Egypt, Candia, and Sicily, and when South America was discovered, the natives were found growing cotton. Yet as it has been well said, cotton could only become an article of trade to those nations which were able, by their industries, to manufacture it into beautiful and durable material, at moderate prices. The manufacture of vegetable substances, combining flexibility and strength, must be of very early date, and to the inhabitants of the temperate and tropic zones especially, the great weight and toughness of skins, must have made patent the advantage of any material which could be made of the necessary strength, and at the same time light and flexible. In ancient times India furnished Europe with her muslins, so called from Mosul, in Mesopotamia. The Assyrian merchants brought such cotton manufactures into Europe, together with their silks from China, their carpets from Persia, and their spices from the East. Herodotus, writing in the year 445 before the Christian era, said of the Indi, "the wild trees bear fleeces for their fruit, surpassing those of the sheep in beauty and excellence, and the natives clothe themselves in cloths made therefrom." From India the manufacture reached Persia, thence it was imported into Egypt, and the eighth century saw its introduction into Europe.

In England for a long time the consumption of cotton was confined to small quantities, principally for candlewicks, and nearly the whole of the cotton fabrics consumed was imported from the Continent. Though as far back as 1328 the Flemings settling in Manchester laid the basis of the British woollen manufacture, in the manufacture of what were called Manchester cottons it was not till the middle of the seventeenth century that cotton-woollens, fustians,

* The vegetable which we now call cotton passed under different names in different times and countries. The term *Carbasus*, *Carbasum*, or *Καρπάσον*, was used by ancient authors to signify cotton. It is so used in the Scripture. The word *כרפס* *carpas* in Esther i, 6, though translated in the common version for "green," means really cotton. In the Vulgate translation, we have "et carbasini ac hyacinthini." In Revelations xviii, 12, the word *Βύσσος*, mentioned as one of the wares of Babylon, may mean cotton. But after the fourth century, cotton was known by various names which had not been before in use. Probably *gossypium* was one of these; another name was *Lana Xylena*, meaning literally tree wool, the plants which produced it being called *ἐπιξύλον*, or wool trees. Another set of names probably arose from a misapplication of the name of the silk-worm. These were *Βομβάκιον*, *Βάμβαξ*, *Βαμβάκιον*, *Πάμβαξ*, whence come *bambacinus*, made of cotton; *bambacenum*, cotton cloth; *bambacarius*, a dealer in cotton cloth; and in Italian *bambagio*, *bambagino*, and *bambasino*. For further researches on the introduction of cotton, see "Textinum Antiquorum," "An Account of the Art of Weaving among the Ancients," by James Yates, F.R.S.

dimities, and other articles were exported to the Continent. But as late as the accession of George III, no fabric consisting entirely of cotton was made, and it was only by the operation of those wonderful inventions which suddenly performed so great a revolution, that cotton acquired the present prominent position as an article of trade in this country. What these inventions were every one well knows: yet there is great interest in recalling those feats of genius which now and then ennoble our common humanity.

Spinning by the spindle and distaff is a very old industry, and, in times not far distant, was considered one of the accomplishments of a good wife. "She layeth her hands to the spindle, and her hands hold the distaff," is the saying of the Book of Proverbs. Minerva, as the instructress of man in the useful arts, is fabled as the author of a distaff and spindle; hence, as Apollodorus informs us the Palladium held in its right hand a spear, and a distaff and spindle in the left. It was the custom among the Romans to carry before the bride a distaff charged with flax, and a spindle likewise furnished. In Greece, when the bride was introduced to her new home, she brought with her a distaff and a spindle, and hung her husband's door with woollen yarn; and in England spinning on the distaff continued long to be the honoured occupation of women.* In process of time the distaff was laid aside for the spinning wheel invented by Jurgen, a citizen of Brunswick, in 1530, though some say that it was known long before him. But though by the spinning wheel there were formed the thick loose cord called a roving, and the fine, thread or yarn, this invention was not attended with great results, because the spinner could only produce one thread at a time, and a man employed eight hours a-day, could only spin three quarters of a pound of yarn. The first substantial improvement was therefore a machine for spinning by rollers, which forms the basis of all the spinning machinery in our factories at the present time, invented by Wyatt, but for which a patent was taken by Lewis Paul, a foreigner; but even that led to no immediate results, as it was scarcely understood at the time. Then came the invention of the fly shuttle and picking peg, which enabled one man, unaided, to weave double the quantity he had theretofore done; and in 1753 Mr. Lawrence Earnshaw invented a spinning machine and cotton reel, but which he himself destroyed, on the plea that it would be the ruin of the working classes. Although these and other minor improvements were for the time barren of results, and were far from proving lucrative to the inventors themselves, they prepared the mind of the people for further changes, and suggested those ideas which even-

* See an able paper on the Distaff and the Spindle, or the Insignia of the Female Sex in Former Times, by John Yonge Akerman, F.S.A., "Archeologia" or Miscellaneous Tracts relating to Antiquity, published by the Society of Antiquaries, vol. xxxvii, p. 83.

tually ended in totally superseding manual labour in the cotton industry.

Ten years after this a reed maker of Leigh, a certain Thomas Wright, found out the principle of the spinning jenny, or a machine by which the spinner was enabled to produce several threads in one operation, and in the following year, in 1764, James Hargreaves gave reality to such a machine, and patented, it. For this, however, he was attacked by a mob of the working people, who broke into his house and destroyed the jenny. Great as was the improvement introduced by the spinning jenny, it still left the process of spinning in a very unsatisfactory state, the cotton not being sufficiently even, firm, or strong for use, as the warp or longitudinal thread of a web. To supply this want, linen yarn was used for the warp, but the mixture of two different materials made the article too costly, and moreover unfit for calico printing. Such was the condition of the cotton manufacture in England when Arkwright invented the water frame. How far he may have profited of the earlier invention of Lewis Paul, of elongating cotton by rollers in the spinning operation, we know not, but what if he did? The law of continuity, or rather of gradual progress, says Lord Brougham, governs all human approaches towards perfection. The limited nature of man's faculties precludes the possibility of his ever reaching at once the utmost excellence of which they are capable. Survey the whole circle of the sciences, and trace the history of our progress in each, you will find this to be the universal rule. Think not that Black and Priestly, Bacon and Adam, Smith, Cuvier, and Watt were respectively the unaided discoverers of the theory of latent heat, and of aeriform fluids, of the inductive system, of economic science, of fossil osteology, and of the power of steam. Even Newton, though far in advance of all others in mathematical and in experimental science, was preceded by Cavalleri, Roberval, Fermat, and Schooten, who came as near as possible to the discovery of the differential calculus. Very romantic is the story of Sir Richard Arkwright. Fancy a barber famous only for his processes for dyeing hair, becoming the founder of the great cotton manufacture. Even after the fruitful idea entered his mind, he could not appear at an election in Preston for want of a suit of clothing. Arkwright's water frame, while drawing out the carding or rolling, gave to it the twist and pressure necessary to produce the hardness and firmness which fitted it so admirably to the purposes of the warp; and it was at the same time capable of producing, in equally vast quantities, yarns of finer quality. The effect of these inventions was, as already noticed a total revolution in the character and operation of the spinners. Thenceforth spinning ceased to be a domestic manufacture, and became the product of mechanical ingenuity, and with it rose also the wonderful factory system which, with its attendant advantages,

economy of power, division of labour, and concentration of skill and superintendence, contributed so much to the extension of the cotton manufacture and the accumulation of wealth. Other inventions followed each other afterwards with great rapidity. To Crompton, of Bolton, we owe the mule jenny, which by uniting the rollers of the water frame with the advancing and receding carriage of the jenny, effected the attenuation and spinning of cotton to a degree of fineness that neither of the other two machines could approach. To Cartwright we owe the power loom, a machine for weaving by automatic power; and to Peel we owe the introduction of calico printing. But we should ill appreciate the value of these and other kindred inventions, if we did not take them in connection with Watt's great discoveries of the use and application of steam power, and with the improvements made in inland navigation by the opening of the Bridgewater canal.

And to what use would have been this great development of the cotton manufacture, had not a corresponding increase taken place in the production of cotton wool? Hitherto the importation of cotton to this country had been very limited. In 1764 we imported scarcely 4,000,000 lbs., and even in 1785, after Arkwright's patent had expired, we imported only 18,000,000 lbs. of cotton. By this time, however, the seed had been transported to the United States, and very soon after a complete change took place in the capability of that country for producing cotton, by the invention of Mr. Whitney's machine to separate cotton from the seed. This machine did for the planters of the American States, what the genius of Arkwright and Watt did for the cotton manufacture in England; and it is to this machine that we owe the gigantic expansion of the cotton trade. Previous to 1790 the United States did not export a single pound of cotton.* Whitney's invention came into

* The following facts regarding the culture of cotton in the American States, were reported by Mr. Finnie, a cotton planter to the Government of India. The cotton now cultivated in Mississippi and Louisiana, came from Mexico, hence the name "Mexican." There is no data as to the precise time and circumstances of its introduction. The cotton known as "Tennessee" and "Upland Georgia," is involved in some degree of uncertainty. The plant is supposed to have come from the Grecian Archipelago in the early settlement of the colony of Virginia, where it was cultivated; but in consequence of the season between the last frost of spring and the first frost of autumn being too short, it did not prove a profitable crop, and the early emigrants from Virginia took with them the seed to the territory of Kentucky. The part of this territory now known as Tennessee, was found to be more favourable, and known as Tennessee cotton it soon acquired a character for cleanliness superior to the "Upland Georgia." As the early adventurers pushed southward, the northern part of Mississippi was discovered to be still more congenial to the plant; the shrub became more and more prolific, and produced a finer quality. The Sea Island cotton came originally from the Isle of Anguilla, in the Caribbean Sea, and furnished the first seed to the early European settlers in the Bahamas; in two islands of the cluster, viz., Long Island and Exuma, they succeeded in producing a fine cotton. A small bag of the seed was sent to a gentleman in Georgia about the year 1785. Ten years before, the first provincial legis-

operation in 1793, and in 1794 1,600,000 lbs. were suddenly exported. In 1791 America grew only $\frac{1}{24}$ th of the produce offered in the markets of the whole world; in 1845, more than seven-eighths of the cotton produced in the world was in the United States of America; and in 1861 they gave upwards of one thousand millions of pounds. And as the production increased, so the consumption increased immensely. Little by little has this interest acquired gigantic proportions. Farther and farther has the use of cotton been extended, and by degrees it has nearly distanced all other branches of British industry.

Of 6,300 factories in the United Kingdom, nearly the half of them are for cotton. Of 36,500,000 spindles, 30,000,000 are for cotton. Of 490,000 power looms, 399,000 are of cotton. Of 779,000 persons employed in factories, 450,000 are employed in cotton. And as compared with foreign countries, whilst we have 30,000,000 spindles, France has 4,000,000 spindles, Russia 2,000,000, Germany 2,000,000, Austria 1,500,000, Switzerland 1,300,000, Italy 500,000, Belgium 500,000, and Spain 300,000. The proportion of the cotton trade to the general trade of this country is very large. Of 377,000,000l.* which constitutes the value of the total trade of the United Kingdom, 94,000,000l. or 25 per cent. is the value of the imports and exports of cotton.

Relation of the Value of Cotton Manufacture and Yarn Exported, to the Total Exports of British and Irish Produce.

[Unit 000's omitted.]

Years.	Value of Cotton Manufactures and Yarns Exported.	Total Value.	Percentage.
	£	£	
1820-24	19,922,	36,782,	46
'25-29	16,974,	36,050,	47
'30-34	18,417,	38,641,	47
'35-39	23,211,	45,250,	51
'40-44	23,806,	52,176,	45
1845-49	24,902,	58,637,	42
'50-54	30,485,	84,002,	35
'55-59	40,658,	116,120,	41
'60.....	52,012,	135,891,	38
'61.....	46,837,	125,115,	37

lature of South Carolina urged the inhabitants to attend to the culture of the cotton plant, but little attention had been paid to it. The seed alluded to was at first planted on the islands bordering the coasts of Georgia and South Carolina, and extending from 32° 30' to 30° of north latitude, through a space of about 200 miles, these islands were originally covered with the luxuriant growth peculiar to a southern clime, and abounded in the beautiful live oak and other evergreens. The soil being new, warm, and fertile, the plant grew most luxuriantly, and gradually extended on the coasts of Georgia and South Carolina.

* This of course is exclusive of the value of all produce raised and consumed in the United Kingdom.—ED. S. J.

Relation of the Value of Raw Cotton to the Total Value of Foreign and Colonial Merchandise Exported.

[Unit 000's omitted.]

Years.	Value of Raw Cotton.	Total Value.	Percentage.
	£	£	
1854	2,302,	18,636,	12
'55	2,475,	21,003,	11
'56	3,346,	23,393,	14
'57	3,431,	24,108,	14
'58	3,955,	23,174,	17
'59	4,218,	28,281,	14
'60	5,388,	28,630,	19
'61	8,578,	35,694,	24

And of 217,000,000l. the total value of our imports, 39,000,000l. was the value of cotton.

Relation of the Value of Raw Cotton Imported, to the Total Imports into the United Kingdom.

[Unit 000's omitted.]

Years.	Value of Cotton (Raw) Imported.	Value of Total Imports.	Percentage.
	£	£	
1854	20,175,	152,389,	13
'55	20,849,	143,543,	14
'56	26,448,	172,544,	15
'57	29,289,	187,844,	15
'58	30,107,	164,584,	18
'59	34,560,	179,182,	18
'60	35,757,	210,531,	17
'61	38,653,	217,352,	18
Total { Imports	38,653,	217,352,	—
	55,415,	160,809,	—
	94,068,	378,161,	40

And who can tell the amount of the cotton manufacture consumed in this country. It probably amounts to 30,000,000l. and more. Calculating the quantity imported reduced by the percentage of waste in the conversion into yarn; and then at so many yards of manufactured goods per pound, with proper deduction for the export of yarn and manufacture, the consumption of cotton in this country may be set down $7\frac{1}{2}$ lbs. per head. In France the consumption is probably 4 lbs. per head. In Germany and Austria 3 lbs. In Italy 2 lbs., and in Russia 1 lb.

But large as is the consumption of cotton in this country, we
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cannot say that it has displaced materially the consumption of wool, linen, or silk. If we import 1,200,000,000 lbs. of cotton, we also import 147,000,000 lbs. of wool, besides the large quantity produced in this country; 224,000,000 lbs. of flax and hemp; and 10,000,000 lbs. of silk. In describing the extent of our trade in cotton, I have not indicated the numerous trades ministering directly or indirectly to the prosecution of this branch of industry. The capital invested in this manufacture has been variously estimated, and may be set down at at least 100,000,000*l*.* whilst the shipping required to carry the large quantity of cotton from the Atlantic and Eastern ports is not less than 1,000,000 tons. The entire interest, from whatever view it is regarded, has colossal proportions, and anything which affects or crushes it, inflicts a deep wound on the resources of the United Kingdom.

The cotton manufacture has some specific localities in this country; chiefly in England; but partly in Scotland. Ireland has just a sprinkling of it. In England, Lancashire is the chief place, next Cheshire, and then Yorkshire and Derbyshire, with a little in Cumberland, Notts, Stafford, Gloucester, and Leicester. In Scotland, Lanarkshire is the chief place, and there is a little in Renfrewshire, Perth, Ayr, &c. Of 450,000 persons employed in this manufacture, 407,000 were in England and Wales, 40,000 in Scotland, and 3,000 in Ireland. The great cotton towns distinguished for their smoke, dirt, bustle, excitement, and dense population, are Manchester, Wigan, Bury, Bolton, Blackburn, Preston, Leigh, Oldham, Ashton, Staleybridge, Hyde, and Stockport. The following are the statistics of factories for textile fabrics, extracted from a return laid before Parliament in 1861:—

* It is difficult to estimate the capital embarked in the cotton manufacture. In an article on the difficulties and dangers of the cotton trade, by Mr. Bazley, M.P., it is stated that the fixed investment, including land and water rights, may amount to 60,000,000*l*., and that to work all these concerns and their ramifications, 20,000,000*l*. more are needed, making in all 80,000,000*l*. Besides this, he valued the mercantile and consumers' stock, in home and foreign markets, of cotton and auxiliary materials, and bankers' capital devoted to the manufacture, at 120,000,000*l*., making the whole gross capital employed in it 200,000,000*l*. This is certainly a large estimate. In the article in the "Encyclopedia Britannica," supposed to be by Mr. Bazley himself, the capital invested in this manufacture was estimated at at 54,000,000*l*. Mr. Redgrave, the factory inspector, in his paper on the Textile Fabrics, presented to the International Statistical Congress, computed the cost of building, steam-engines, machinery, &c., at 21,000,000*l*., raw materials 8,000,000*l*., wages 4,000,000*l*., grease, oil, leather, 1,000,000*l*., making in all 34,000,000*l*., and if we take Mr. Ellison's estimate as given in Mr. Mann's work, of 23*s*. to 24*s*. per spindle, and 24*l*. per loom, we shall have for 30,387,000 spindles and 399,992 power looms, 45,000,000*l*. Estimated floating capital and cash in the hands of bankers, 25,000,000*l*.; probable capital employed by manufacturers in subsequent processes of bleaching, dyeing, printing, 30,000,000*l*.; floating capital of importers of raw materials, shipowners, &c., 9,500,000*l*., total 110,000,000*l*.

Statistics of Factories for Textile Fabrics.

	Number of Factories.	Number of Spindles.	Number of Power Looms.	Number of Operatives.
ENGLAND—				
Lancaster	1,979	21,530,532	306,423	315,627
York	369	2,414,898	17,393	27,810
Chester	212	3,373,113	32,926	40,860
Derby	79	682,008	7,581	12,965
Cumberland	15	136,212	1,761	3,281
Middlesex	10	5,834	—	323
Stafford	8	81,116	694	1,982
Leicester	3	4,408	14	219
Nottingham	26	36,000	—	2,183
Flint	1	21,800	—	190
Suffolk	1	—	32	52
Warwick	7	—	186	445
Surrey	2	—	—	53
Gloucester	1	66,004	1,115	1,514
Norfolk	2	—	—	94
	2,715	28,351,925	368,125	407,598
SCOTLAND—				
Aberdeen	2	66,276	70	770
Bute	4	52,148	977	976
Dumbarton	4	75,296	246	758
Dumfries	1	16,308	—	112
Lanark	83	1,138,602	24,149	27,065
Linlithgow	1	19,800	—	121
Perth	3	57,796	552	1,069
Renfrew	32	408,742	2,968	8,749
Stirling	5	50,190	180	528
Ayr	3	30,240	968	1,089
	138	1,915,398	30,110	41,237
IRELAND—				
Antrim	3	72,884	200	639
Dublin	2	11,668	391	492
Londonderry	1	—	60	77
Tyrone	1	—	36	18
Waterford	1	30,292	940	1,412
Wexford	1	5,100	130	96
	9	119,944	1,757	2,734
Cotton Factories United Kingdom				
	2,887	30,387,267	399,992	451,569
Woollen Factories—				
Woollen	1,679	2,182,609	21,770	86,983
Worsted	532	1,289,172	43,048	86,063
Flax	399	1,216,674	14,792	87,429
Hemp	5	2,580	1	607
Jute	36	32,982	554	5,967
Hosiery	69	—	—	4,487
Silk	771	1,338,544	10,709	52,429
	6,378	36,449,828	490,866	779,534

There is one important feature in the cotton industry, which invests it with something more than simple commercial considerations, it is, that cotton has greatly contributed to the spread of comfort and civilization among the masses of the people. Hitherto it has been the cheapest material for clothing ever produced. Even where the masses are yet sunk in the most abject condition, and in places not yet brightened by the light of civilization and Christianity, wherever, in fact, a cover is needed to shelter man, whether in frozen regions or in tropical climates, a cotton dress and a fustian jacket will ever find a hearty welcome. In a paper read by Mr. Ashworth before the Society of Arts, he compared cotton with wool and flax. One pound of wool for flannel cost 18*d.* per lb.; when manufactured into cloth it costs 3*s.* 1*d.* per lb.; 1 lb. of flax for shirting costs 10*d.* per lb., when manufactured it costs 2*s.* 4*d.*, but 1 lb. of cotton for shirting, which used to cost 6*d.* per lb., when manufactured costs only 1*s.* per lb. The materials for a full dress of outer garments, if composed of wool, would cost not less than 30*s.*, whilst the same quantity of material of cotton, and of more durable quality, cost only 7*s.* 6*d.* to 10*s.* The labourer's wife was able to purchase from a draper a neat and good cotton print at 5*d.* per yard, and allowing seven yards to the dress, the material required only 2*s.* 11*d.* How much more is the cost of a woollen dress even of the lowest quality. This source of economy, which entirely depends now upon the cost of the materials, makes the question of cotton supply a consumer's question,—a question in which we are all interested.

And how extensive is our commerce in this article. It is an extraordinary fact that we are importing nearly 600,000 tons of cotton from a distance of four thousand miles and even 13,000 miles, and after redistributing about 78,000 tons of it in an unmanufactured state, we convert the remainder into yarn and woven manufacture of all kinds at three times the original cost of the raw material when landed on our shores. Whilst the value of the raw cotton imported in usual years amounts to about 36,000,000*l.* to 38,000,000*l.*, the value of the cotton manufactures exported, besides the entire quantity consumed in this country amounts to as much as 47,000,000*l.* to 50,000,000*l.* Our exports of cotton manufactures and yarns are enormous. We are sending abroad yearly some thousand millions of yards of calico printed and dyed; and we could not in our space give the quantities of other articles. With the general adoption of better principles of commercial policy, most nations have been reducing sensibly their duties on cotton manufactures and yarn. Even France hitherto closed to British goods has now been opened, and bids fair to become a most extensive field for commercial intercourse. How auspicious was it to have thus opened a new outlet for

our industries just before the stream of prosperity ceased to flow towards the country with which we had the largest trade. What lessons does it teach us to be always ready to seize favourable opportunities when they are offered to us.

Some surprise, or rather fear has been expressed in influential quarters, on seeing Russian and Swiss cotton yarn sold in the British market. Most likely it was sent to this country to take advantage of the high prices. Certainly the time has not come yet when these countries can produce more than they can consume themselves, or produce cotton yarn cheaper than British manufacturers. But can it be that a formidable competition is likely to be met with in future in this, we may say, the most indigenous of English manufactures? Nothing, certainly, hinders foreign manufacturers, with wealth at their command, from importing this exotic vegetable as we do; or India from consuming the article of her own growth; and manufacturing it to the highest perfection. Nor are they hindered from importing the best machinery ever invented, the most skilful engineers, the most skilled workmen. All is now free. This is no longer the age of mystery. No longer the age of artificial protection to national industry. And yet we anticipate that English manufacturers will always be able to face such competition, and permanently maintain the supremacy they have hitherto enjoyed. And why? It is because we must attach the greatest importance to our national character, to the strenuous energies of our manufacturers to overcome difficulties wherever they may present themselves, and, above all, to the moral worth, and physical aptitude of our people to work hard and long. Whilst the present pre-eminence of Britain in wealth, with her command of the markets of the world, and her riches in coal and iron, which no nation can rob her of, and no free trade can communicate to others, will ever keep her at the head of the manufacturing countries of the world.

Having now shown the vast importance of the cotton trade and manufacture, and the large proportion it bears to the commerce of the kingdom, the first consideration naturally suggested is, that one of the largest of our industries is wholly dependent on a material which we do not possess ourselves, and which other nations may deprive us of. It is an industry tributary to foreign countries, and entirely dependent upon the commercial relations of this part of the world with America, Asia, and Africa. When we think of this it might at first sight appear that other industries which work out indigenous products are safer and more satisfactory. Nothing, however, can be more delusive than this. There is no industry independent of all vicissitudes from without. The agricultural does not depend for the seed from foreign countries, but it depends for its prosperity on the prosperity of the consumers, who are again dependent on those adventitious occurrences which foster or check the avenues of

wealth in any part of the world. But there is a further aggravation in the dependence of the cotton manufacture in the fact that the large increase of the manufacture in this country has been almost entirely supplied by American material. The countries which used in ancient times to supply cotton to Europe have remained quite stationary in their production, whilst America has made gigantic strides. In 1814 of 538,000 cwts. of cotton imported, only 106,000 cwts. were from the United States of America; in 1844 of 5,268,000 cwts. imported 4,600,000 cwts. came from North America, and in 1860 out of 12,400,000 cwts. imported, nearly 10,000,000 cwts. came from the United States.

The following table of the imports of cotton from 1815 to 1862, is derived principally from a work on the "Cotton Trade of Great Britain," by James A. Mann, F.S.S., to whom I am indebted for much additional information on the subject.

Cotton Imported, 1815-62.*

Years.	United States.	Per Cent.	Brazil.	Per Cent.	Mediterranean.	Per Cent.
	lbs.		lbs.		lbs.	
1815-19	59,405,	46	19,084,	15	322,	—
'20-24	103,844,	68	24,361,	15	2,463,	2
'25-29	159,326,	70	24,358,	11	10,294,	5
'30-34	231,337,	79	26,531,	9	4,751,	2
'35-39	327,552,	79	22,973,	6	7,769,	2
1840-44	470,417,	81	17,287,	3	8,798,	1
'45-49	525,590,	84	21,116,	3	11,662,	2
'50-54	647,205,	78	24,008,	3	27,159,	3
'55-59	782,275,	76	23,483,	2	33,751,	3
'60.....	1,115,891,	80	17,287,	1	44,037,	3
'61.....	819,501,	65	17,290,	1	41,479,	3
'62.....	32,000,	5½	60,000,	10½	64,000,	11

Years.	East India.	Per Cent.	West India.	Per Cent.	Other Parts.	Per Cent.	Total.
	lbs.		lbs.		lbs.		lbs.
1815-19	34,294,	26	11,223,	8	6,109,	5	130,439,
'20-24	13,553,	9	7,515,	5	1,830,	1	153,566,
'25-29	23,793,	10	6,129,	3	1,818,	1	225,718,
'30-34	27,828,	9	2,450,	1	1,103,	—	294,000,
'35-39	51,260,	12	1,580,	—	3,905,	1	415,039,
1840-44	84,344,	14	1,192,	—	4,268,	1	585,307,
'45-49	66,371,	11	995,	—	873,	—	626,607,
'50-54	125,621,	16	428,	—	2,249,	—	826,670,
'55-59	180,213,	18	667,	—	8,668,	1	1,029,058,
'60.....	204,141,	14	1,051,	—	8,533,	—	1,390,939,
'61.....	369,040,	29	486,	—	9,180,	—	1,256,985,
'62.....	420,000,	11½	11,000,	1½	—	—	587,000,

* In this, and most of the following tables, the last three figures are omitted; thus, 59,405, = 59,405,000.

This complete dependence on one country for the supply of one of the most important articles of British industry has always been regarded with the greatest anxiety. What if the produce of the United States should fail altogether for one single year? What if we were in actual war with them? How extensive would be the sufferings of our population! What derangement, what ruin would it cause among our labouring classes. And how such a loss would re-act on all the other branches of trade. For a considerable time some of the most intelligent Manchester manufacturers have been sounding the alarm, and again and again they pressed upon Her Majesty's Government the need of directing their attention to other cotton producing countries, especially to India and the British colonies, with a view to remove all the obstacles which might exist to the fullest production of cotton. But many and great are such hinderances, and when the fatal contest between the United and Confederate States of America unfortunately commenced it found us as unprepared as ever to meet the dire calamity.

And what is our present position? The question must be considered under two aspects. First, as it affects us now,—what are our immediate prospects of supplies to keep our factories at work? Second, as it will affect the future,—what are likely to be the consequences of this civil war on the production of cotton throughout the world? We have already seen the quantity imported in this country for a long period since 1815. For further elucidation we shall give the imports for the last ten years, as stated in the Liverpool Cotton Brokers' Circular.

Imports of Cotton in the United Kingdom in Thousand Bales.

	American.	East India.	Other Quarters.	Total.
1852	1,784,	213,	344,	2,341,
'53	1,532,	485,	248,	2,265,
'54	1,667,	308,	198,	2,173,
'55	1,621,	395,	259,	2,275,
'56	1,758,	464,	246,	2,468,
1857	1,478,	681,	262,	2,421,
'58	1,854,	357,	220,	2,431,
'59	2,085,	511,	232,	2,828,
'60	2,580,	562,	221,	3,363,
'61	1,841,	986,	208,	3,035,
'62	72,	1,073,	300,	1,445,

The quantity taken for consumption since 1835 have been as follows:—

	Average lbs. Mins.		Average lbs. Mins.
1835-39	373,	1855-59	888,
'40-44	515,	'60	1,084,
'45-49	574,	'61	1,007,
'50-54	705,	'62	480,

And in weekly number of bales the same was as follows since 1852:—

	Bales. Thousands.		Bales. Thousands.
1852	36,	1858	41,
'53	35,	'59	44,
'54	37,	'60	50,
'55	40,	'61	43,
'56	43,	'62	22,
'57	38,		

The exports since 1835 have been as follows:—

	Average lbs. Mlrs.		Average lbs. Mlrs.
1835-39	35,	1855-59	145,
'40-45	32,	'60	256,
'45-49	73,	'61	285,
'50-54	120,	'62	230,

And in bales since 1852 as follows:—

	Bales. Thousands.		Bales. Thousands.
1852	282,	1858	344,
'53	349,	'59	436,
'54	317,	'60	609,
'55	317,	'61	677,
'56	311,	'62	564,
'57	337,		

And the stock of cotton at the end of each year during the following periods since 1835, was as follows:—

	Average lbs. Mlrs.		Average lbs. Mlrs.
1835-39	91,	1855-59	171,
'40-44	241,	'60	250,
'45-49	239,	'61	294,
'50-54	237,	'62	184,

And in bales, distinguishing American, East India, and other qualities were as follows since 1852, in thousand bales:—

	American.	East India.	Other Qualities.	Total.
1852	363,	131,	163,	657,
'53	308,	230,	139,	717,
'54	311,	202,	111,	624,
'55	236,	133,	117,	486,
'56	178,	99,	55,	332,
1857	202,	191,	159,	452,
'58	269,	56,	47,	372,
'59	307,	116,	47,	470,
'60	395,	196,	43,	594,
'61	283,	378,	38,	699,
'62	70,	300,	63,	233,

From these tables it will be seen that our stock is now much less than it was in 1860 and 1861, but not much short of the stock held in previous years. It will be seen, moreover, as regards the importation, that from the United States we received in 1862 only 72,000 bales against 1,840,000 bales in 1861; and 2,579,000 bales in 1860; and from British India we received 1,073,000 against 986,000 bales in 1861, and 562,000 bales in 1860, a very trifling increase comparatively to the loss we suffered on our importation from America.

Such then is our position as regards quantity, and now as to prices. The average price per pound of bowed cotton at the close of each year from 1815 to this time has been as follows:—

Years.	Average Price.	Years.	Average Price.	Years.	Average Price.	Years.	Average Price.
1815.....	d.	1827	6½	1839	7½	1851	5½
'16.....	18½	'28	6½	'40	6	'52	5½
'17.....	20½	'29	5½	'41	6½	'53	5½
'18.....	20½	'30	6½	'42	5½	'54	5½
'19.....	13½	'31	6	'43	4½	'55	5½
1820.....	11½	1832	6½	1844	4½	1856	6
'21.....	9½	'33	8½	'45	4½	'57	7½
'22.....	8½	'34	8½	'46	4½	'58	6½
'23.....	8½	'35	10½	'47	6½	'59	6½
'24.....	8½	'36	9½	'48	4½	'60	7 to 7½
1825.....	11½	1837	7	1849	5½	1861	7½ „ 12½
'26.....	6½	'38	7	'50	7½	'62	12½ „ 26

It is difficult to prognosticate whether or not present prices will be maintained, as they will be modified by every turn of American politics; but it is quite evident that the high rates have already immensely diminished the consumption, and that they will continue to have that effect so as to more than balance the supply and demand. It is probable that, during last year, dealers resorted almost exclusively to the stock on hand of manufactured goods, whereby such stocks, in all parts of the world, will have been considerably reduced. But we can scarcely expect an extensive demand during the next year; first, because for some years past the exports, especially to India, have been far in excess of the demand, and secondly, because the large consumption of cotton was decidedly owing to the very low prices at which calicoes and other articles of general use were sold.

Secondly, what are our future prospects as to supplies? This question mainly depends on the capacity of other countries to produce. First among these is decidedly the United States. The cotton district of the United States lies between 30 and 36 degrees of latitude, extending from the Atlantic coast westerly

through 20 degrees of longitude. From this belt of country scarce 400 miles in width, but including within it the States of New Orleans, Texas, Georgia, South Carolina, North Carolina, Virginia, Florida, and Alabama; the vast American product is gathered amounting in good seasons to nigh 4,000,000 bales. And, but for the secession of the entire district, the prosperity and increase of the last few years would have justified the belief that the annual yield would have been doubled. We can scarcely hazard an opinion as to the probable effect of this revolution on slave labour. Should slavery be abolished we may fairly anticipate, an almost total cessation of cotton production in those States for some years to come; at least judging from the corresponding effect of the abolition of slavery in the West Indies Colonies. But even should the Confederate States succeed in obtaining their independence and strengthening their institutions, it is most likely that agriculture and other interests will feel for some time the influence of the present rupture in want of capital and want of spirit for large commercial operations, especially in consequence of the withdrawal of capital by the Northern people. What may be the quantity of cotton now on hand in the Confederate States it is impossible to say. The estimates, varying considerably, are not reliable.

India has always been the hope and chief reliance of the cotton manufacturers. There is no question as to the boundless capacity of India to produce any quantity of cotton. It is estimated that the annual growth of cotton in India is between 4,000,000 and 5,000,000 bales. Though certain districts are specially marked in the map of India* as cotton-growing districts, they indicate those portions only which have been producing, without excluding those which *may* produce, this fibre. As yet the only part from whence we derived our imports from India are those bordering on the sea, where the cost of transport is not so high. Let the railways penetrate the interior and we shall receive double or treble the present quantities. But the quality of Indian cotton is neither so good or clean as the American. True. The Surat is decidedly short-stapled and dirty; but we are now receiving cotton from India produced from American seed, which compares favourably with American cotton. The samples of cotton at the International Exhibition showed this remarkable fact, that whilst the mean length of staple of native cotton, or cotton from native seed, was nine-tenths of an inch, the mean length of cotton from foreign seed was 1.66 inch, and that whilst the valuation of native cotton was from 6d.

* A coloured map of India was exhibited, showing the district which had hitherto produced cotton. The districts so marked are Kurrachee, Shekapoor, Guicowacs, Khandeish, Nizam, Aurungabad, Jubbulpore, Belgaum, Bellary, Kurroor, Guntoor, Coembartoor, Tinnevelly, Mushra, Agra, &c.

to 8d. that of foreign seed cotton was from 12d. to 16d. per lb. It will be seen also from the diagram exhibited* that the mean length of staple of New Orleans cotton is 1.02, of Sea Islands 1.61, of South America, Brazil, 1.17 and of Egypt 1.41.

I am not sufficiently acquainted with the present adaptation of the machinery for other qualities than American. We may sympathise with the manufacturers if they refuse making extensive changes, in the uncertainty which exists about American politics. But we may be quite sure that a good deal of work is already done in the way of using Indian cotton, and that we shall by degrees see considerable modification in the people's mind respecting this produce. As it is, the great bulk of our consumption did never consist of the finest long-stapled Sea Island. A good ordinary or a middling New Orleans has been the quality most in use, and this quality, we are assured, may be obtained freely from India. For some years past the proportion of Indian to other kinds of cotton imported has been constantly increasing, and if the prospects in America continue gloomy, we may anticipate that our imports from India will increase enormously. The extension of railways and internal navigation will greatly facilitate the carriage of cotton from the interior to the shipping ports, and the superintendence of Europeans will tend to improve the quality and make it more and more adapted to the existing machinery. It is an important fact to know that cotton can be grown in India at a price which will enable the European in ordinary

* A diagram was also exhibited showing the length of staples of different kinds of cotton, kindly lent by Dr. Forbes Watson, of the India Museum, which showed the following results:—

	Mean Length of Staple. Inches.
United States upland	1.02
„ Sea Island	1.61
„ Florida	1.58
Pernambuco	1.35
Peru	1.30
Surinam	1.30
Maranham	1.15
Paraiba	1.20
South American Brazilian	1.17
Egypt	1.41
Algiers	1.50
Lagos	0.90
Loanda	1.05
Port Natal	1.10
Java	1.10
Australia	1.65
India, indigenous or native	0.89
„ exotic or American	1.08
„ Sea Island	1.50

seasons to lay it down in Liverpool at a less cost than New Orleans. I have not time to enter into the alleged shortcomings of the Indian Government, in fostering the cultivation of cotton. No one will argue that the Government should itself cultivate it. They have encouraged as far as it was in their power the formation of railways. They have even spent some half-million pounds in experiments in planting the American seed. But as to give a bounty in the shape of an exemption from the land tax, I doubt very much whether it would be expedient or proper. The cultivation of the soil, the working of mines, the planting of factories, are matters exclusively dependent on private exertions, and it would be most injurious were the Government to give privileges and exemptions to any branch of industry. It would teach lessons, the evil effects of which would not be so easily eradicated. Other colonies are striving to produce cotton. Jamaica has entered vigorously in the competition. A Company has been formed there to stimulate the growth of cotton. Australia has exhibited some splendid samples at the International Exhibition. Queensland especially is likely to afford considerable supplies. Natal is doing its utmost to offer some quantity, and there is every facility for producing cotton in Honduras,* though in these colonies the difficulty of providing labour and its great cost must always prove an insuperable barrier. Among foreign countries Egypt promises to become a large field for the cultivation of cotton. The Viceroy has given his countenance to the works recommended by the Cotton Supply Association. Turkey possesses vast tracts of country, which by soil and climate are peculiarly

* *Honduras*.—The whole of Central America from the Isthmus of Tehuantepec to that of Panama, including the peninsula of Yucatan, is pre-eminently a cotton growing region. Everywhere the cotton plant in several of its best and most important varieties, is both indigenous and perennial. That valuable variety the Anguela, better known to commerce as "Sea Island," is a native of Honduras, whence it was sent to the United States shortly after the revolution. The seeds of the native variety are entirely bare of down, and may be removed by the roller gin. Hand-picked samples from Honduras have been reported fit for making the finest Nottingham lace. There is another variety known as the clustered or kidney seed. It is a strong and long staple cotton, but not fine, excellent however for the heavier kinds of cloth. The seeds are almost bare, adhering together instead of being detached, for which reason the bolls are easily picked from the plant, with little intermixture of dry leaves. This variety is very hardy, and grows everywhere in Central America, inland and at high elevations, as well as in the low lands near the sea. There are other indigenous kinds, fine but adhering closely to the seeds and difficult to clean, except with the saw gin. One of the varieties is of a grey colour, another reddish, furnishing cloth of corresponding shades. The ordinary cotton plant which in South Carolina is an annual, being killed every year by the frost, rising only to a spread and height of eighteen inches or two feet; becomes a perennial in Central America, or from four to six feet in height and spread. The yield is two crops of 500 lbs. each per acre, or 1,000 lbs. per year.—M. Squire's report of 25th January, 1861, published in the "Cotton Supply Reporter" of 1st March, 1862.

adapted to cotton. Italy, which fifty years ago supplied nearly the whole of the cotton consumed in the chief markets of Europe, has set herself in earnest to extend considerably the cultivation of cotton.* Indeed when we consider the abundance and cheapness of labour there, the vicinity of Italy to this country, the state of civilization, and the perfect acquaintance of the people with the cultivation of cotton, we much doubt whether any other country besides the United States and India, offers anything like the prospect of a large continuous and cheap supply of cotton as Italy. South and Central America, including Brazil, Peru, Paraguay, &c., can do much to supply large quantities. Still taking them altogether it will be a long time ere they can furnish sufficient to make up for the enormous quantities we have been receiving from America. But long as it may be, that time will come, and then in all probability we shall have double the quantity heretofore produced in the two continents. Nor it will be too much. The consumption has been sensibly increasing in late years, and will still further increase as civilization and comforts advance. And we may safely anticipate that whatever be the quantity attainable, it will not be more than enough to meet the increasing demands of the population of the world.

As might have been expected, the sudden failure of the chief supply of cotton not only rendered it necessary to seek elsewhere for land and climate adapted to the cultivation of the fibre, but has exercised the ingenuity of many to find substitutes for cotton in other vegetable substances. Prominent among these is the *Zostera Marina*, discovered by Mr. Henry Harben, a fibre which may be collected in great abundance all along the sea shore, and which, it is asserted, has many of the requisites of cotton. Jute has been suggested to be spun on cotton machinery. The Rhea bark fibre has been proposed, and also the *lichen plicatus*, or the hairy tree. It is difficult to say whether the anticipations of the respective inventors or discoverers will be realized, but it will be long before any of them can compete successfully with cotton, whilst it is a question whether the cost of labour in this country will not prevent any attempt at obtain-

* *Italy*.—The species of cotton grown in Italy are the *Gossypium herbaceum* and the *Gossypium siamense*. The cotton region embraces a great extent of country, viz., from the extreme south to the neighbourhood of the valley of the Tronto, lat. 43 deg. N. on the Adriatic Sea; on the western shore it extends rather farther north. A hectare of land in Italy yields from 250 to 600 kilograms of cotton, or from 2 to 4½ cwt. per acre. There are probably 8,000 square kilometres, or 80,000 hectares, now lying waste, which might be cultivated annually with cotton in the southern continental provinces alone. Of these 8,000 square kilometres, if only one-third were cultivated, there would be a produce of 100,000 tons, or about 550,000 bales. A valuable report on the cultivation of cotton in Italy has been issued by M. G. Devincenzi, Italian commissioner to the International Exhibition, 1862.

ing and reducing any such materials in sufficiently large quantity for our consumption.

It is not the object of this paper to dwell on the effect of the present scarcity of cotton on our manufacturing district. Suffice it to say that at least 400,000 persons have been thrown out of employment and compelled to depend for their subsistence on the charity of their fellow-men. Assuming that 400,000 workpeople are employed when all the mills are running, there would be about 250,000*l.* per week of direct wages. About the fourth is now employed. The remainder is nearly entirely idle. And though we cannot anticipate the chances of employment for the future, we may safely reckon that during the whole of next year, unless the American ports are suddenly opened, there will not be work for more than three days a-week, which will cause a continuous loss of half the amount of wages.

It is probable that the factory system which has of late years been introduced in our manufactures, whilst highly advantageous for promoting material wealth, aggravates a good deal the evil consequences of such contingencies. It may be that factory workers are more likely to enter heedlessly into marriage as they require to make no provision for a workshop, tools, and other outlays, once necessary for entering life, while they have the prospect of the wife and soon of the children as contributors to the support of the family. It may be that the factory system tends to accumulate masses of persons called *prolétaires*, who have no provision for a week but the labour of that week. Whatever it is, we must accept the evil and the good together. The sudden cessation of that work which constitutes the only means of livelihood of so many thousand families is a serious event. All we can do is to alleviate its awful consequences by our prompt and liberal assistance.

[It will interest the reader to refer to Mr. G. R. Porter's Paper, on the "Statistics of the Cotton Trade in Great Britain," in vol. xiii of the *Journal*. The crop in the United States in 1848-9, is stated by Mr. Porter to be 2,728,596 bags. Mr. Porter remarks that "There is a growing opinion that now and for some few years past, we have reached the maximum supply of cotton from the United States, a fact which should it prove correct, makes it a matter of absolute necessity either to seek for further supplies of the article from other sources, or to find some efficient substitute that shall provide the means of employment for our constantly growing numbers."—ED. S. J.]

Note.—The following communication was made to the Society in connection with Dr. Leone Levi's paper, by Commendatore Devincenzi, Royal Commissioner for Italy to the International Exhibition:—

In Italy the cultivation of cotton is very ancient. We can trace it as far back as the ninth century. Before cotton was cultivated in America Italy supplied a large quantity of cotton to all the European nations, and during the Continental wars of the First Empire, Italian cotton was the only kind which could be procured in the European market, so that during that period the cultiva-

tion of cotton was very extensive in Italy, and constituted one of the principal agricultural products of the country.

The Italian Government, having lately again taken up the question of cotton cultivation, has principally turned its attention to some leading points, and first of all to the capability of Italy to produce cotton, both as regards the land and manual labour.

The provinces of Italy that lie south of 43° N. lat., embracing a surface of country of 380,350 square miles, and containing a population of upwards of 10,000,000 inhabitants, are included in the zone of cotton cultivation in Italy. All the land in this zone which does not rise more than 500 feet above the sea level, and is not more than 34 miles distant from the shore, especially if it has a southern or eastern aspect, is adapted to this cultivation. At least 5,434,000 acres in this vast zone is capable of producing cotton.

Cotton cultivation is carried on in Italy on a tolerably good principle. From the numerous data that we have collected from all the provinces, it results that the average produce of an English acre of land is 320 to 500 lbs. of cleaned cotton.

We know that the average produce of cotton in America is little above 300 lbs. per acre, and in India 70 lbs.

It is considered in Italy that the average produce of cotton, with an improved system of farming throughout the country, might be much increased.

If only the fifth part of the land suited now to the cultivation of cotton in Italy should be effectually cultivated, it would produce about 1,000,000 bales of cotton. Neither would this cultivation interfere very materially with the present agriculture of Italy, because there is abundance of land now almost abandoned, especially in the south and in the islands, which, with proper drainage, would be eminently adapted to the cultivation of cotton.

From what I know, in the provinces of the mainland alone, there are nearly 2,000,000 acres of waste land, that could be very easily reclaimed, and that, turned to the cultivation of cotton, could produce two other millions of bales.

A great extent of this land, especially in Calabria, Basilicata, Puglia, Salerno, and Sicily, is rented very low. The low price of this land is the result of the misrule that for so many centuries has completely crushed all enterprise in Southern Italy. There is not a single river embanked, not a stream turned to the advantage of irrigation; there are no roads; the ancient harbours have been choked up. That beautiful country once so flourishing and civilized, under the name of Magna Grecia, has been for centuries deserted.

The new Italian Government is very desirous to improve this country. The railway from Turin to Ancona, already opened, is being pushed forward through this country. The section from Ancona to Pescara will be opened in a couple of months, and that from Pescara to Foggia very likely before the end of the year. From Foggia to Brindisi and Otranto the line will be completed in two years and a-half. In the line from Bari to Taranto, and from Taranto to Roseto, bordering on the Ionian Sea, they are at work at different points; so in the Sicilian lines from Messina to Syracuse, from Catania to Palermo, Girgenti and Licata.

The railway from Naples to Rome is just completed, and so is that from Naples to Salerno, which in a few months will reach Eboli.

All these railways will pass through the land suited to the cultivation of cotton.

The Government is promoting simultaneously the construction of roads, and has turned its attention to the harbours. In a short time Bari and Brindisi will be efficient ports for every purpose.

These great public works cannot fail to promote the immediate progress of agriculture and the cultivation of cotton in Italy.

The rural population is very numerous and their wages very low. The wages of a good farm labourer rarely exceed 10*d.* or 1*s.* per diem. So that there is no limit either for extent of land or for abundance of manual labour, to the production of cotton in Italy.

Another point we were anxious to ascertain was the minimum price at which cotton could be cultivated in Italy.

A large mass of data was collected accurately from the various provinces of Italy, which I am sorry that, for want of space, I cannot submit in detail to the Society; permit me to assert that as long as the price of cotton does not fall lower than 4d. per pound, cotton may be cultivated with benefit in Italy, and compete with many of the staple agricultural products of the country. One hectare of land cultivated with cotton even at 4d., will give to the cultivator a net return of more than 180 francs, which he is very far from obtaining from other produce in a great many provinces of the country.

According to the best authorities, it is said that in America cotton cannot be produced at a lower price than 4d. per lb. Therefore, even if America should reassume the position that she had before the war, as regards the cotton trade, this cultivation might be profitably carried on in Italy.

The last point which the Italian Government were anxious to ascertain was, whether the quality of the cotton already cultivated in Italy was such as would command a sale in the principal cotton markets. To ascertain this point we took advantage of the International Exhibition. The Italian Government collected as many samples of cotton from different localities as possible, and sent them to the Exhibition.

As Royal Commissioner for Italy, in the month of June I submitted to the Committee of the Manchester Cotton Supply Association the various samples of Italian cotton exhibited. The Cotton Supply Association deputed a member of their committee, Mr. W. Wanklyn, to come to London and examine the samples in the International Exhibition.

Of fifty-six samples of Italian cotton, Mr. Wanklyn valued eleven at the same or higher price than fair New Orleans; more than half of the samples, namely twenty-nine, at the same price, or even higher, than the middling New Orleans; forty-four at the same price, or higher price, than good ordinary New Orleans, and only one, the worst, at a price equal to the choicest qualities of East India cotton.

On the 6th of January, I went to Manchester, and submitted to the Committee of the Cotton Supply Association, fifty or sixty samples of Italian cotton. After accurate examination, the Committee passed a resolution that I shall beg your permission to transcribe.

Resolved—

"That the Committee of this Association having examined the collection of samples of cotton, grown in Italy, and submitted from the Royal Italian Commissioner, is of opinion that they are a good useful class of cottons, some of them indeed being superior to middling American, but with careful cultivation and cleaning, the aggregate production of Italian cotton may be rendered equally as desirable."

It will not, perhaps, be without utility to state what may be reasonably expected from Italy this year. Some provinces of Italy where cotton may be cultivated, are unhappily afflicted by brigandage. I hope that there will soon be an end of it, as the Government has taken very strong measures to put it down. But there are a great many provinces perfectly quiet, and which have never been in the slightest degree disturbed. These are the provinces of Calabria, Sicily, and the island of Sardinia. I am convinced that the Government will do everything to promote this cultivation of cotton. There is a great quantity of land prepared for other cultivation, and especially for Indian corn, that would be immediately cultivated with cotton to more advantage this very year. There are plenty of landed proprietors who are preparing to cultivate cotton. There is a large field for private enterprise, and there is no new country that could give this year so much cotton as Italy.

To recapitulate, we have seen that there is in Italy, plenty of cheap land and manual labour, with good method of cultivation and good quality of cotton.

I must apologize for having trespassed so much upon your space, but I thought it was well to call your attention to an extensive cotton field in Europe, only about 80 to 100 hours distant from London.

On the RATE of MORTALITY prevailing amongst the FAMILIES of the PEERAGE during the NINETEENTH CENTURY. By ARTHUR HUTCHESON BAILEY, Actuary of the Equity and Law Assurance Society, and Fellow of the Institute of Actuaries; and ARCHIBALD DAY, Actuary of the London and Provincial Law Assurance Society, and Fellow of the Institute of Actuaries.

[From the "Assurance Magazine and Journal of the Institute of Actuaries," vol. ix, part 6, July, 1861.]

IN a note in the introduction to Milne's "Treatise on Annuities," the author remarks—"There can, I think be no doubt but that the mortality is greater among the higher than the middle classes of society. They form too small a proportion of the population to have any sensible effect here; but it would be of importance to the Life Offices to determine the law of mortality among them." Since the publication of this work, forty-six years ago, some attempts have been made to test the accuracy of this assertion, and to supply the desideratum; but none with which we are acquainted are by any means conclusive.

In a tract, privately printed in the year 1832, entitled, "Observations on the Mortalities among the Members of the British Peerage," by the late Mr. George Farren, the author investigates the average duration of the enjoyment of the title by each peer, from observations made in 740 cases. Out of these, the ages are stated to have been recorded in 447 instances,—of which 288 succeeded to the title between the ages of 10 and 40; from which the conclusion was deduced (and this is the only result stated), that at the age of 25, the mean duration of life of the peers is very nearly 32 years, which corresponds with the mean duration by the Carlisle Table, at the age eight years older. The process adopted is not stated; but, independently of this and other objections, it will probably be considered that the number of facts observed was too small to warrant any general conclusions on the subject.

Mr. Edmonds contributed to the "Lancet" of the 10th February, 1838, and the 9th March, 1839, two papers—on the "Duration of Life in the English Peerage," and on the "Lineage of English Peers." His observations—extending, apparently, over a long interval of time—were made on 675 peers (32, whose deaths were violent or accidental, having been excluded), during the period of

their possession of the title only. These 675 peers were the representatives of 109 titles, the first and last peer in the line of succession having been omitted. In 243 cases the ages were not stated, and this defect was supplied by an approximation made by observing the recorded dates of birth of other peers in the same line of descent. The results are given in three tables, from which it appears that the mortality among the peers is very much in excess of that of the Carlisle Table, but corresponds pretty nearly with a theoretical table constructed by Mr. Edmonds himself, which he designates "City Mortality," according to which the mortality at every age is 50 per cent. greater than in the Carlisle Table. The process by which these results are arrived at is nowhere stated, so that any verification of them is impossible. The number of facts seems to us altogether insufficient, and has been needlessly diminished by the exclusion of the first peer and the existing peer of every title, apparently for no other reason than that they were not required for another investigation which Mr. Edmonds had then in progress. The proportion of cases in which the ages were not recorded is very large—36 per cent. of the whole number; and the hypothetical method adopted for supplying this defect is, we think, open to considerable objection, especially as Mr. Edmonds seems to imply that had he carried out his original intention of deducing the mortality from those peers only whose ages were recorded, the results would have been different. Also, the probable effect of confining the observations to the period of the occupancy of the title only, will have been, if hereditary tendencies had their usual influence, to exaggerate the mortality of the younger ages, because the peers who succeeded to the title when young must as a general rule, have been the sons of short lived parents, and they would not enter into combination for several years with the sons of the long-lived parents, as the latter, for the most part, would not have succeeded to the title until older ages had been attained. Moreover, Mr. Edmonds's plan excludes altogether female and infant mortality, and takes but little account of that of the periods of childhood and youth. For these reasons, we cannot consider his investigations satisfactory or sufficient.

More recently, Dr. Guy made some observations on a much greater number of facts, the results of which he embodied in two papers read before the Statistical Society, and published in their *Journal* for March, 1845, and March, 1846. Dr. Guy's process is very clearly stated, and is sufficiently simple. He extracted from a Peerage and Baronetage in his possession the ages at death of 2,291 male lives who died above the age of 21 in a period of time extending from the thirteenth century to the year 1830, and having obtained the number of deaths at each age, a table of the mean

duration of life was calculated from these materials. The result—somewhat unexpected, Dr. Guy says—being, that the mean duration of life among these classes is nowhere greater, and at all ages under 70 is materially less, than among the general male population of the country. Entertaining, as we do, a very sincere respect for Dr. Guy's scientific attainments, we cannot, at the same time, avoid remarking that his investigations upon the subject of mortality are unsatisfactory; all his observations having been made on the ages at death only, without any regard to the numbers living. This is not a fitting opportunity, nor can it be necessary here, to enlarge on this point. That observations made from deaths alone will always give erroneous results of the mortality, except in the case of a stationary population, is well known to all who have studied the subject: those who have not may consult Milne's article in the "Encyclopædia Britannica" on "Mortality," and the 5th and 6th Annual Reports, with the Appendices, of the Registrar-General.

The results obtained by Dr. Guy have frequently been quoted both in newspapers and scientific publications—among others, by Mr. Neison, in his "Contributions to Vital Statistics"—and reasons attempted to be assigned for the conclusions arrived at. Now, as it is certain that, whether Dr. Guy's conclusions are correct or not, they cannot be deduced from the facts which he collected, and not being satisfied with the investigations of his predecessors in the same path, we resolved to undertake the not inconsiderable labour of determining the mortality prevailing among the families of the peerage by proper technical methods, tracing each case through every year of the period of observation, and comparing the number of deaths with the number of living in each year of age.

II.

Before commencing this task, however, the question arose—what reliance could be placed upon the accuracy of the peerage books? Having made some inquiries on this matter, we are informed, on good authority, that the process of their compilation is some such as the following:—The editors glean from the newspapers, from time to time, occurrences in the way of births, deaths, and marriages, and make the necessary alterations in the current editions of their works. A proof is then sent annually to each peer of the portion relating to his own family, with a request that he will be good enough to correct and return it. And although the proofs are not all returned annually, the editors express the utmost confidence that, except in a few instances, communications are always made to them whenever corrections are required, and that the several dates are accurately recorded. Having satisfied ourselves upon this important point, the next matter was to select which of

the different Peerages should be made use of. The first at hand that of Burke, was quickly discarded. With a chivalrous spirit, worthy of the Ulster King-at-Arms, he invariably omits the dates of birth of the ladies; and his work, therefore, although probably well adapted for general circulation, was altogether unsuited for our purpose. We then turned to "Lodge's Peerage;" here the facts we required were fully and clearly given, even the still-born births being accurately recorded, and the only objection was, that it did not extend sufficiently far back in point of time. To remedy this, recourse was had to an older Peerage by Debrett; and from these two sources, with occasional reference to Burke, in cases of doubt or discrepancy, all the necessary information was obtained.

We had then to consider what should be the limits of our investigation. To have extended our researches back to distant generations would have been objectionable, because, as an impression commonly prevails that the rate of mortality has progressively improved, comparisons with other tables derived from modern data might have been considered inadmissible. Also, had we followed Mr. Farren and Mr. Edmonds, in restricting the observations to peers only, the number of facts would, in our judgment, have been insufficient, independently of other objections. On the other hand, had we included all the collateral branches, the distinctive features of the class would have been lost. We therefore determined, that the observations should be limited in point of time to the present century, and should be made upon peers, sons and daughters of peers, and sons and daughters of the eldest sons of peers.

The observations commence with the anniversary of the date of birth in the year 1800 of those who were born in the last century, and with the actual date of birth for the remainder, and terminate on the 31st December, 1855; the only assumption introduced being, that when, as it occasionally happened, the year only of birth or death was given, the day being omitted, this latter was taken to be the 30th June. Those cases were altogether excluded in which the year of birth was not recorded. The number of facts obtained was as follows, viz.:—

	Males.	Females.	Both Sexes.
Deaths.....	1,938	1,253	3,191
Existing, 31st December, 1855....	2,283	1,999	4,282
Totals	4,221	3,252	7,473

When it is considered that the data from which the Carlisle Table of Mortality, which is probably the one in most general use, was derived, were two enumerations, made at an interval of about nine years, of 7,677 persons living on the first occasion, and 8,677 on the second; that the number of deaths was 1,840; and the ages obtained merely from information voluntarily given, we hope that in regard to time, numbers, and accuracy, the present materials may possess some value.

The extracts having been made separately for each sex, and afterwards combined, the results will be found in Tables I, II, and III, which are sufficiently explained by the headings of the columns. The only remarks needed being, that the number exposed to the risk was obtained by subtracting from the number who completed the age half of the number existing on the 31st December, 1855—that, as was unavoidable, the numbers at the oldest ages were somewhat arbitrarily dealt with—and that the mean duration of life was computed by means of the equation—

$$\text{Log. } e_x = \text{log. } p_x + \text{log. } (1 + e_{x+1}),$$

Where e_x represents the curtate mean duration at the age x . All the processes, both of making the extracts and the computations, were performed by each of us independently of the other.

As was to have been expected, the column representing the annual mortality exhibits numerous irregularities, but we have purposely abstained from applying any method of graduation. Indispensable as this process is for many applications of tables of mortality, and great as has been the ingenuity expended upon it, the process itself can only be regarded as a necessary evil; and, without going so far as to say, with Professor De Morgan, that "the practice cannot be too strongly condemned," the force of his remark, that, "the tables thereby lose some of their value as representations of physical facts," is undeniable. And as the process was neither necessary nor desirable for one of the chief objects of this investigation—the comparison of the results with those of other tables—we have preferred to leave the observations unadjusted.

Examples of these results, compared with those of other tables of authority, will be found in Tables IV, V, and VI. The observations selected for comparison have been—of male lives exclusively, the English Life Table, representing the mortality of the population in general; the experience of the Equitable Society (chiefly males); that of the Government Annuitants, from Mr. Alexander Finlaison's recent Report; and the mortality of healthy districts, from a paper by Dr. Farr, lately read before the Royal Society. The latter, having been derived from the records of sixty-three districts of the country

where the average annual mortality in 1,000 did not exceed 17, the general average being 22, is considered by Dr. Farr to be "the nearest approximation we can obtain to a table representing the human race in the normal state." For female lives exclusively, we have selected for comparison the corresponding tables of the English Life Table, the Government Annuity Table, and the healthy districts; and for both sexes combined, the Carlisle Table, and the general table of the healthy districts.

III.

Referring first to *Male lives only*, it will be found that the average mean duration of life among the families of the peerage is, at all ages under 73, *greater* than among the general population of the country, greater even than among the selected lives of the Equitable Society, (with the unimportant exception of the period from 15 to 21, where the number of cases in that Society was very small); greater, at all ages under 62, than among the Government annuitants; and throughout, approaches pretty nearly to the standard table of the mortality of the healthy districts. At the older ages, it very nearly coincides both with the English Life Table and the Equitable experience, but is somewhat less than that of the Government annuitants. Looking to particular periods of life, it will be observed that the advantage in favour of the families of the peerage is most remarkable in infancy and childhood—the mortality under the age of 10 years being little more than one-third of that of the general population. In the next decade, the two tables nearly coincide; but at the succeeding period from 20 to 29, a very singular anomaly occurs. There the mortality among the families of the peerage is not only in excess of that of the English and Equitable Tables, but, contrary to our previous notions, is also materially greater than in the next decennial interval. A similar anomaly occurs in the Government annuitants, and also in the Society of Friends.* At all other ages, up to 80, the advantage is with the aristocratic class.

It is evident, therefore, that Dr. Guy's conclusions on this subject are erroneous; and to make this more clear, we have thought it worth while to compute a table of the mean duration of life, deduced from the deaths alone, in the present observations, and have placed some examples of it in juxtaposition with the corresponding results deduced by the correct method, and also by Dr. Guy.

* In this Society, the annual mortality per cent. among the males has been found to be at the ages 20–29, .881; and at the ages 30–39, .782. Our information on the subject is derived from a most complete and interesting paper "On the Vital Statistics of the Society of Friends," by Joseph John Fox, read before the Statistical Society, 21st December, 1858.

Males.—Peerage Families.

Age.	Mean Duration of Life.	Do. deduced from the Deaths only.	
		Present Observations.	Dr. Guy.
20	41.46	36.42	38.48
30	33.51	31.63	30.88
40	28.33	25.36	24.45
50	21.40	19.38	17.92
60	14.56	13.27	12.57
70	8.77	8.03	8.15
80	4.58	4.20	5.09

The above table is, we think, deserving of some attention—partly because the erroneous method of observation is very common with the medical profession; and partly, because the results of such observations are received with implicit confidence in some quarters where it could least have been expected.

IV.

Turning next to the tables for *Female life exclusively*, it will be observed that the average mean duration of life among the families of the peerage is, throughout *materially greater* than with the general population, coincides in a very remarkable manner, up to the age of 55, with that of the Government annuitants, and also of the inhabitants of the healthy districts, but surpasses them both for the remainder of life—indicating a more favourable mortality at the older ages than any table whatever with which we are acquainted. It will be seen that, as with the males, the contrast with the general population is most marked under the age of 10, but that in the next decade the mortality is somewhat in excess; the abnormal feature noticed in the males thus appearing among the females, but not to so great an extent, and occurring at a somewhat earlier period of life. The singularly favourable mortality above the age of 70 will not escape attention.

We believe that no previous attempt has been made to investigate the mortality prevailing among females of the higher classes in this country, and are not without hope that the present one may, owing to the trustworthiness of the data, help to elucidate the subject of female mortality generally. The known difficulty of obtaining accurate information on so delicate a subject as ladies' ages has, undoubtedly tended to throw some degree of suspicion upon all results obtained from any general records of the female population. Even the compilers of the Census of 1851, laudably eager as they are

to break a lance in defence of the veracity of their countrywomen, were reluctantly compelled to admit that this part of the returns required some awkward and troublesome corrections, and cited the case of an eminent French statist, who after many persevering but fruitless attempts, had abandoned in despair a philosophical inquiry which had for its object to determine the ages of his wife and his cook.

Table VII will illustrate the comparative mortality of the sexes. As this is a subject of some interest, and as the evidence respecting it is conflicting, we have thought it deserving of some further examination.

The superior longevity of the Female sex having long been well known, one of the most striking results of the combined experience of the Assurance Offices was that the mortality amongst assured females was greater than amongst assured males. Several explanations of this apparent anomaly have been offered, none of them very satisfactory, and some altogether absurd; but, after a careful consideration of the matter, we cannot help thinking that the anomaly does not really exist at all. According to Dr. Farr's Tables, the mortality in the period of infancy is greater among boys than girls, from 2 to 40 years of age the mortality of females is in excess, while for the remainder of life the females have the advantage over the males in a marked degree. And we find that the remarkable tenacity of female life in old age so far outweighs the greater mortality of the sex shortly before and during the childbearing period, as to give to the female sex an average mean duration of life greater than that of the male throughout the whole of the table. These results the present observations confirm in every respect—they exhibit the superior vitality of *Females in infancy*, their remarkable tenacity of life in old age, and their greater mortality in youth and the prime of life; for notwithstanding the abnormal mortality of males between the ages of 20 and 30, it will be found that, taking the entire period from 5 to 45 years of age, the female mortality is in excess. Bearing these peculiarities in mind, it was certainly somewhat startling to find on referring to the Combined Experience Tables, that the female mortality in the decade 70-79 was both so great absolutely, and so much in excess of the male, especially as between the ages of 45 and 70 the female mortality is less. But on looking more closely, and remarking that the objection often urged, that these tables represent the experience not of lives but of policies, is serious when the numbers are small, though not, perhaps, very important when they are large, we discover that the whole number of claims above the age of 70, under policies on female lives, in all the combined Offices, was exactly 60, and only 477 at all ages. And the actuaries themselves assign the paucity of the numbers as a reason for the apparent excess of the female mortality at the older ages,

admitting that no importance is to be attached to this result. But as the facts were avowedly insufficient to bring out the peculiar tenacity of life of the female sex in old age, the result is perfectly consistent with other observations. Instead, therefore, of asserting that the "mortality amongst assured females, taking all ages together, is greater than amongst assured males," we think a more accurate statement would have been, that the experience of the Offices confirms the result of other observations, which show the greater mortality of females during the childbearing period, and affording little or no information for the periods of infancy and old age, it did not possess the means of exhibiting the general mortality of the sex. In corroboration of this may be adduced the valuable information furnished by the experience, of the Eagle Office, where the number of female deaths exceeded those of all the combined Offices. In the experience of the Eagle, the female mortality was lower than the male taking all ages together; while, at the same time, under the age of 42, it was considerably in excess. And it must not be forgotten that the average period of observation of each life, although greater than with the combined Offices, did not exceed $8\frac{1}{2}$ years; so that there is reason to believe that, if the observations were continued to the present time, the greater general vitality of the female sex would be still more apparent.

On the other hand, the late Mr. Finlaison, whose experience and authority on this subject were very great, stoutly contended that "the fact is undoubtedly certain, that the mortality of the *female sex*, at every period of life, is less than that of the male sex "at the same ages, excepting only in infancy," and supported this assertion by numerous tables deduced from observations made on the nominees of certain tontines, and also on the Government annuitants from 1808 to 1825. These observations have been continued to the 31st December, 1850, by Mr Alexander Finlaison, and the results have been recently published in a report by that gentleman. The later results confirming, in this particular, the former observations, Mr. Alexander Finlaison appears to consider that his father's views are now unimpeachable, and form a standard by which the accuracy of other tables may be tested. Applying this test to the English Life Table, he makes the following remarks:—"At the youthful and earlier adult ages, the mortality of the female "is represented to be greater than that of the male. This conclusion "is contrary to most previous experience. It is a result which is "also contrary to nature. The sexes are not created in equal "numbers. For every twenty females there are produced twenty-one "males. But no fact is more thoroughly established, than that when- "ever the population is counted the females are present in consider- "ably greater number. . . . Such a result could not take place

"unless the stronger sex were subjected to a higher rate of mortality, "died off much faster than the females."

From these observations we must express our dissent. Dr. Farr's conclusion is not contrary to most previous experience. Not only in the English Life Table, but also in the observations on the inhabitants of the healthy districts, on assured lives, and on the Society of Friends, the mortality of the female in the youthful and earlier adult ages is found to be greater than that of the male; and in every published table of mortality to which we have been able to refer, excepting only Mr. Finlaison's and the Swedish Tables, the mortality of the female is, at particular ages, in excess of that of the male. The peculiarity of Mr. Finlaison's results may, perhaps, be accounted for by the probability that a large proportion of the females in his observations are unmarried, and by the scantiness of his materials in middle life compared with their abundance at the older ages.

The English Life Table is not contrary to nature; for, concurrently with the greater mortality of the female at particular ages, we almost invariably observe a greater general mortality of the male. The two circumstances—the excess of male births and the greater general mortality of that sex—together cause that nearly uniform proportion of the sexes which successive enumerations disclose.

How far the long and elaborate attack on the English Life Table in Mr. Alexander Finlaison's report is consistent with the official etiquette usually observed by different departments of the State towards each other, we do not presume to determine. If the National Debt Office and the General Register Office are at variance, assuredly *non nostrum est tantas componere lites*. We only endeavour, amongst conflicting statements, to search for the truth; and the result of our inquiries on this particular subject—the comparative mortality of the sexes—has been to confirm the views of Dr. Farr, and not those of Mr. Finlaison. On the whole, if human life be divided into three great periods—of infancy, maturity, and old age—the weight of evidence is in favour of the general conclusions, that, at the two extremes, the mortality of the female sex is less, and at the intervening period greater than that of the male; the probable after-lifetime being at all ages, greater for the female.

The examples of the general table of Mortality of the families of the Peerage will suffice to dispel the previous views that have been propounded on the subject, and remove the erroneous ideas into which even so judicious and accomplished a writer as Milne has fallen, and which led Mr. Edmonds to make the unfounded assertion that "the severest mortality is to be looked for in the poorest class, "of a city population, and in the highest class of the moneyed or non-labouring portion of the community." It will be observed that the

mean duration of life among the families of the Peerage approaches nearly to that in Dr. Farr's standard table, and, with one slight exception, is throughout greater than in the Carlisle Table. This exception occurs about the age of 80, and may be readily explained by the circumstance, that in the population of Carlisle, from which the mortality table was framed, the females were about 55 per cent. of the whole number—a much greater proportion than occurs in the general population. In our observations, on the contrary, the males outnumber the females—a greater number of cases in the latter sex having to be rejected owing to deficiency of dates. Had it not been for this circumstance, the results of the general table would have proved even more favourable.

The peculiar features of the mortality at different periods of life have already been sufficiently discussed.

V.

One or two remarks on the application that may be made of the results of the present investigation, in the occupations in which most of us are engaged, may not be considered inappropriate. Adopting the common division of the different ranks of society—into upper, middle, and lower classes—it may be safely stated that the latter, although forming the great bulk of the community, have hardly any dealings with Life Offices. And we are inclined to think that the somewhat heterogeneous mass called the middle class does not resort to these Offices to the same extent, in proportion to its number, as the higher classes. It is, we are aware, a popular belief, that the extent of the practice of life assurance in this country affords strong evidence of the provident habits of the community, and that the success of the Offices in Great Britain is attributable to the greater degree of prudence and forethought prevailing here than among the nations of the Continent. But some of those who have had the most experience in the matter would probably be of opinion that the practice of life assurance affords quite as much evidence of improvident as of provident habits; that the Offices obtain as many supporters from those who exceed as from those who live within their incomes; and that their success is attributable, in no slight degree, to the extent to which the practice of making settlements of property prevails in this country, and to the consequent number and variety of life interests of a pecuniary nature arising therefrom. However this may be, there can be no doubt that those who are beneficially interested in these settlements, but, at the same time, have not usually much ready money at command (a description not unfrequently applicable to the class now under observation), are introduced to the Assurance Offices in considerable numbers. It cannot, therefore, be otherwise than satisfactory to find that the mortality

prevailing among the class in question is decidedly more favourable than any which the experience of the Offices has yet furnished.

The present investigation also indicates that the effect expected to be produced by selection of lives is much exaggerated; at the same time it confirms an opinion occasionally expressed, and which seems to be founded on experience, that the best lives are those that are assured for large amounts.

It may, perhaps, be of some service in a department of our practice which urgently requires amendment—the system upon which extra premiums for foreign residence are charged. The male lives that have formed the subject of the present investigation have been found to experience an unusually favourable mortality; yet they enter the army and navy in large numbers, travel extensively, and are certainly more exposed to what the Assurance Offices consider extra risks, than the middle classes. It would seem, therefore, to be no unfair inference, that differences of climate have less effect on human mortality than differences of occupation and position in life; and as the Offices do not attach much importance to the latter—taking a butcher and a country clergyman on similar terms—they might perhaps relax somewhat in their estimate of the former. Considering the very unsatisfactory character of the present practice in this respect, it might be worth consideration whether any serious risk would be incurred by dispensing altogether, in the majority of cases, with the existing restrictions on foreign travelling and residence.

On the other hand, the results of this investigation afford some suggestions for the exercise of caution. The most painful comparison presented by the present tables is the remarkable difference in the mortality of the *children* when contrasted with the general population. Now, as it may be tolerably safely assumed that all children for whom endowments are purchased will be well cared for, it would seem that both the Carlisle and English Tables are unsafe data for the calculation of Endowment premiums.

The exceptional mortality also of the period of *early manhood* confirmed as it is by the experience both of the Government annuitants and of the Society of Friends, indicates that those assurances are not the most desirable that are effected under the age of 30 for *terms of years*, on an increasing scale of premium, or on that most inconsistent and odious method called the “half credit system.” The same circumstance will perhaps explain why, in the Economic Office, it has been found that the highest rate of mortality has been experienced on term assurances.

The information obtained upon the comparative mortality of the sexes leads to the conclusions, that tables of mortality for all purposes of life assurance should be derived from observations on *male* lives chiefly, or exclusively; that the greater vitality of the *female*

will not justify any reduction of premium in contracts of assurance, because, on account of the large proportion of policies that are suffered to lapse, the greatest amount of risk will usually be incurred in middle life, at which particular period the female mortality is greater than the male. On the other hand, the distinction of sex is of serious moment in all contracts of annuities, immediate, deferred, and contingent; because in those cases the most important period is that of old age, where the distinction between the mortality of the sexes is most marked. The distinction is also important in another branch of our pursuits, where we believe, it is frequently overlooked—we mean in the valuation of reversionary interests.

Finally, if this investigation should tend to encourage the belief that the mortality of each well-defined class has peculiar characteristics of its own, it must weaken the hold that the Carlisle Table has upon some of its votaries, who seem to consider that for all purposes, and under all circumstances, their favourite table is applicable. A consideration of the characteristic features, both of these and of other observations on persons in affluent circumstances, may suggest to another class of enthusiasts, that there are many other causes affecting the mortality of mankind besides the sanitary condition of their habitations; and that although ventilation, drainage, and water supply are all very necessary things, they are not “all the law.” “and the prophets” notwithstanding. That the peculiar features of the present observations belong to the normal law of mortality of the human race, it would, we think, be very unwise either to affirm or deny. Notwithstanding all that has been written on that subject we remain of opinion that that law is yet undiscovered, and that a much greater number and variety of observations than we at present possess will be required for its discovery. Such a law, if discovered, would be of high interest, both to the physiologist and the mathematician. But it will represent the law that really prevails among the living, moving, thinking men that inhabit the earth, much in the same way that the statue of the Apollo Belvedere represents their bodily form. Such a law will never supersede, in our pursuits at least, the exercise of that careful judgment and sound discrimination which it should be our study to cultivate, and without which the most varied talents will be useless and the greatest attainments vain.

TABLE I.—Males.

Age (x).	Completed the Age x.	Existing 31 Dec., 1855, between the Ages x and x + 1.	Died between the Ages x and x + 1.	Number Exposed to the Risk from the Age x to x + 1.	Pro- bability of Dying in the Year.	Pro- bability of Surviving the Year.	Mean Duration of Life.
0.....	2534	31	197	2518.5	.07821	.92179	52.00
1.....	2358	38	38	2339.0	.01625	.98375	55.37
2.....	2326	27	20	2312.5	.00865	.99135	55.25
3.....	2328	42	9	2307.0	.00390	.99610	54.73
4.....	2315	42	10	2294.0	.00436	.99564	53.93
5.....	2302	27	11	2288.5	.00481	.99519	53.16
6.....	2293	45	4	2270.5	.00176	.99824	52.42
7.....	2276	34	6	2259.0	.00266	.99734	51.51
8.....	2271	49	10	2246.5	.00445	.99555	50.66
9.....	2250	30	8	2235.0	.00358	.99642	49.88
10.....	2249	42	9	2228.0	.00404	.99596	49.04
11.....	2238	36	13	2220.0	.00586	.99414	48.23
12.....	2230	26	8	2217.0	.00361	.99639	47.52
13.....	2231	28	11	2217.0	.00496	.99504	46.68
14.....	2227	36	5	2209.0	.00226	.99774	45.91
15.....	2225	34	9	2208.0	.00408	.99592	45.02
16.....	2223	33	16	2207.5	.00725	.99275	44.21
17.....	2211	30	14	2196.0	.00638	.99362	43.53
18.....	2197	27	16	2183.5	.00733	.99267	42.82
19.....	2188	36	17	2170.0	.00783	.99217	42.13
20.....	2174	48	18	2150.0	.00837	.99163	41.46
21.....	2135	42	35	2114.0	.01656	.98344	40.80
22.....	2089	32	20	2073.0	.00965	.99035	40.47
23.....	2077	31	24	2061.5	.01163	.98837	39.87
24.....	2053	36	18	2035.0	.00885	.99115	39.33
25.....	2035	31	23	2019.5	.01139	.98861	38.67
26.....	2010	38	25	1991.5	.01255	.98745	38.10
27.....	1985	24	15	1973.0	.00760	.99240	37.58
28.....	1978	40	17	1958.0	.00868	.99132	36.86
29.....	1949	27	18	1935.5	.00930	.99070	36.18
30.....	1938	36	24	1920.0	.01250	.98750	35.51
31.....	1899	35	11	1881.5	.00585	.99415	34.96
32.....	1882	30	19	1867.0	.01018	.98982	34.17
33.....	1867	34	14	1850.0	.00757	.99243	33.51
34.....	1851	31	12	1835.5	.00654	.99346	32.75
35.....	1835	26	10	1822.0	.00549	.99451	31.97
36.....	1815	33	25	1798.5	.01390	.98610	31.15
37.....	1773	49	11	1748.5	.00629	.99371	30.58
38.....	1738	31	17	1722.5	.00987	.99013	29.77
39.....	1720	28	15	1706.0	.00879	.99121	29.08
40.....	1697	30	23	1682.0	.01367	.98633	28.33
41.....	1657	36	16	1639.0	.00976	.99024	27.71
42.....	1626	26	22	1613.0	.01364	.98636	26.99
43.....	1604	37	17	1585.6	.01072	.98928	26.34
44.....	1565	38	10	1546.0	.00647	.99353	25.63
45.....	1537	39	22	1517.5	.01450	.98550	24.80

TABLE I.—Males—Contd.

Age (x).	Completed the Age x.	Existing 31 Dec., 1855, between the Ages x and x + 1.	Died between the Ages x and x + 1.	Number Exposed to the Risk from the Age x to x + 1.	Pro- bability of Dying in the Year.	Pro- bability of Surviving the Year.	Mean Duration of Life.
46.....	1489	26	22	1476.0	.01491	.98509	24.16
47.....	1464	37	19	1445.5	.01314	.98686	23.52
48.....	1419	30	19	1404.0	.01353	.98647	22.82
49.....	1385	26	17	1372.0	.01239	.98761	22.13
50.....	1355	29	21	1340.5	.01567	.98433	21.40
51.....	1317	29	18	1302.5	.01382	.98618	20.74
52.....	1280	31	15	1264.5	.01186	.98814	20.02
53.....	1244	33	21	1227.5	.01711	.98289	19.25
54.....	1201	21	27	1190.5	.02268	.97732	18.58
55.....	1161	28	19	1147.0	.01656	.98344	18.00
56.....	1128	35	24	1110.5	.02161	.97839	17.30
57.....	1074	27	11	1060.5	.01037	.98963	16.66
58.....	1042	33	27	1025.5	.02633	.97367	15.83
59.....	989	18	20	980.0	.02041	.97959	15.25
60.....	957	15	19	949.5	.02001	.97999	14.56
61.....	930	19	26	920.5	.02818	.97182	13.85
62.....	891	16	24	883.0	.02717	.97283	13.23
63.....	859	18	32	850.0	.03764	.96236	12.59
64.....	815	23	24	803.5	.02986	.97014	12.05
65.....	775	20	33	765.0	.04313	.95687	11.41
66.....	725	13	27	718.5	.03758	.96242	10.90
67.....	687	18	27	678.0	.03983	.96017	10.30
68.....	645	16	34	637.0	.05338	.94662	9.71
69.....	602	16	35	594.0	.05892	.91108	9.23
70.....	557	13	36	550.5	.06539	.93461	8.77
71.....	513	15	32	505.5	.06330	.93670	8.35
72.....	470	15	25	462.5	.05405	.94595	7.88
73.....	432	6	32	429.0	.07457	.92543	7.31
74.....	396	10	35	391.0	.08952	.91048	6.85
75.....	355	9	39	350.5	.11127	.88873	6.48
76.....	314	8	29	310.0	.09354	.90646	6.23
77.....	280	8	27	276.0	.09783	.90217	5.82
78.....	235	8	27	231.0	.11688	.88312	5.40
79.....	212	5	22	209.5	.10501	.89499	5.05
80.....	187	4	20	185.0	.10811	.89189	4.58
81.....	165	5	29	162.5	.17846	.82154	4.08
82.....	131	6	16	128.0	.12500	.87500	3.85
83.....	109	3	21	107.5	.19535	.80465	3.33
84.....	85	—	19	85.0	.22353	.77647	3.02
85.....	66	2	15	65.0	.23077	.76923	2.74
86.....	49	3	13	47.5	.27369	.72631	2.41
87.....	33	1	11	32.5	.33846	.66154	2.14
88.....	21	3	8	19.5	.41026	.58974	1.97
89.....	10	—	3	10.0	.30000	.70000	2.00
90.....	7	—	3	7.0	.42847	.57153	1.64
91.....	4	—	1	4.0	.25000	.75000	1.50
92.....	3	—	2	3.0	.66666	.33334	.83
93.....	1	1	—	.5	—	—	—

TABLE II.—Females.

Age (x).	Completed the Age x.	Existing 31 Dec., 1855, between the Ages x and x + 1.	Died between the Ages x and x + 1.	Number Exposed to the Risk from the Age x to x + 1.	Pro- bability of Dying in the Year.	Pro- bability of Surviving the Year.	Mean Duration of Life.
0.....	2152	33	127	2135.5	.05948	.94052	53.71
1.....	2029	30	33	2014.0	.01639	.98361	56.09
2.....	2003	36	14	1985.0	.00705	.99295	56.00
3.....	1987	35	11	1969.5	.00559	.99441	55.41
4.....	1979	35	11	1961.5	.00561	.99439	54.71
5.....	1963	36	5	1945.0	.00257	.99743	54.02
6.....	1945	34	11	1928.0	.00571	.99429	53.15
7.....	1926	33	11	1909.5	.00576	.99424	52.45
8.....	1912	31	8	1896.5	.00422	.99578	51.75
9.....	1901	35	7	1883.5	.00372	.99628	50.98
10.....	1889	34	16	1872.0	.00854	.99146	50.16
11.....	1861	34	18	1844.0	.00976	.99024	49.58
12.....	1835	29	11	1820.5	.00604	.99396	49.06
13.....	1834	40	4	1814.0	.00220	.99780	48.35
14.....	1822	33	12	1805.5	.00665	.99335	47.46
15.....	1813	35	8	1795.5	.00445	.99555	46.77
16.....	1794	34	10	1777.0	.00563	.99437	45.97
17.....	1776	30	20	1761.0	.01136	.98864	45.23
18.....	1745	37	11	1726.5	.00637	.99363	44.74
19.....	1722	38	18	1703.0	.01057	.98943	44.02
20.....	1698	26	12	1685.0	.00712	.99288	43.48
21.....	1679	34	12	1662.0	.00722	.99278	42.79
22.....	1656	23	11	1644.5	.00669	.99331	42.10
23.....	1643	32	16	1627.0	.00983	.99017	41.39
24.....	1621	36	14	1603.0	.00873	.99127	40.80
25.....	1596	29	14	1581.5	.00885	.99115	40.16
26.....	1575	32	11	1559.0	.00706	.99294	39.50
27.....	1560	29	13	1545.5	.00841	.99159	38.78
28.....	1538	25	18	1525.5	.01180	.98820	38.10
29.....	1518	27	11	1504.5	.00731	.99269	37.54
30.....	1495	30	9	1480.0	.00608	.99392	36.82
31.....	1479	27	12	1465.5	.00818	.99182	36.04
32.....	1461	24	13	1449.0	.00897	.99103	35.33
33.....	1434	32	18	1418.0	.01269	.98731	34.65
34.....	1405	22	10	1394.0	.00717	.99283	34.09
35.....	1383	22	20	1372.0	.01458	.98542	33.35
36.....	1358	27	10	1344.5	.00744	.99256	32.83
37.....	1335	20	12	1325.0	.00906	.99094	32.08
38.....	1315	29	11	1300.5	.00846	.99154	31.37
39.....	1287	31	12	1271.5	.00944	.99056	30.64
40.....	1257	23	20	1245.5	.01606	.98394	29.93
41.....	1225	32	13	1209.0	.01075	.98925	29.40
42.....	1190	24	8	1178.0	.00679	.99321	28.71
43.....	1164	28	16	1150.0	.01391	.98609	27.91
44.....	1123	34	15	1106.0	.01356	.98644	27.30
45.....	1079	28	13	1065.0	.01221	.98779	26.66

TABLE II.—Females.—Contd.

Age (x).	Completed the Age x.	Existing 31 Dec., 1855, between the Ages x and x + 1.	Died between the Ages x and x + 1.	Number Exposed to the Risk from the Age x to x + 1.	Pro- bability of Dying in the Year.	Pro- bability of Surviving the Year.	Mean Duration of Life.
46.....	1049	35	14	1031.5	.01358	.98642	25.99
47.....	1006	16	9	998.0	.00902	.99098	25.34
48.....	986	33	8	969.5	.00825	.99175	24.56
49.....	952	25	13	939.5	.01383	.98617	23.76
50.....	924	29	16	909.5	.01759	.98241	23.08
51.....	883	21	10	872.5	.01146	.98854	22.49
52.....	857	19	5	847.5	.00590	.99410	21.74
53.....	839	19	11	829.5	.01326	.98674	20.87
54.....	816	31	16	800.5	.01998	.98002	20.14
55.....	776	21	17	765.5	.02220	.97780	19.54
56.....	740	20	20	730.0	.02740	.97260	18.98
57.....	704	22	10	693.0	.01443	.98557	18.49
58.....	673	20	15	663.0	.02262	.97738	17.76
59.....	639	22	10	628.0	.01592	.98408	17.15
60.....	607	16	15	599.0	.02504	.97496	16.42
61.....	576	10	18	571.0	.03152	.96848	15.83
62.....	549	14	18	542.0	.03321	.96679	15.34
63.....	517	19	11	507.5	.02167	.97833	14.84
64.....	490	8	20	486.0	.04115	.95885	14.16
65.....	463	12	22	457.0	.04814	.95186	13.74
66.....	430	13	13	423.5	.03069	.96931	13.41
67.....	405	14	12	398.0	.03015	.96985	12.82
68.....	380	15	18	372.5	.04832	.95168	12.20
69.....	349	13	14	342.5	.04088	.95912	11.80
70.....	326	19	13	316.5	.04108	.95892	11.28
71.....	296	13	17	289.5	.05872	.94128	10.74
72.....	267	12	11	261.0	.04214	.95786	10.39
73.....	246	6	13	243.0	.05350	.94650	9.82
74.....	227	6	20	224.0	.08929	.91071	9.35
75.....	202	8	10	198.0	.05051	.95949	9.22
76.....	184	4	10	182.0	.05495	.94505	8.69
77.....	170	7	16	166.5	.09610	.90390	8.16
78.....	147	3	8	145.5	.05498	.94502	7.98
79.....	136	7	9	132.5	.06792	.93208	7.41
80.....	120	8	13	116.0	.11207	.88793	6.92
81.....	99	4	13	97.0	.13402	.86598	6.73
82.....	82	7	10	78.5	.12739	.87261	6.69
83.....	65	1	6	61.5	.09302	.90698	6.60
84.....	58	3	3	56.5	.05310	.94690	6.22
85.....	52	1	11	51.5	.21360	.78640	5.54
86.....	40	2	3	39.0	.07692	.92308	5.91
87.....	35	3	3	33.5	.08955	.91045	5.36
88.....	29	—	4	29.0	.13793	.86207	4.84
89.....	25	1	3	24.5	.12245	.87755	4.54
90.....	21	1	4	20.5	.19512	.80488	4.10

TABLE II.—Females—Contd.

Age (x).	Completed the Age x.	Existing 31 Dec., 1855, between the Ages x and x + 1.	Died between the Ages x and x + 1.	Number Exposed to the Risk from the Age x to x + 1.	Probability of Dying in the Year.	Probability of Surviving the Year.	Mean Duration of Life.
91	16	1	2	15.5	.12903	.87097	3.97
92	13	2	2	12.0	.16667	.83333	3.49
93	9	—	1	9.0	.11111	.88889	3.08
94	8	1	2	7.5	.26667	.73333	2.41
95	5	—	1	5.0	.20000	.80000	2.10
96	4	2	—	3.0	.33333	.66667	1.50
97	2	—	—	2.0	.50000	.50000	1.00
98	2	—	—	2.0	—	—	—
99	2	—	—	2.0	—	—	—
100	2	—	—	2.0	—	—	—
101	2	1	—	1.5	—	—	—
102	1	—	—	1.0	—	—	—
103	1	—	—	1.0	—	—	—
104	1	1	—	.5	—	—	—

TABLE III.—Both Sexes.

Age (x).	Number Exposed to the Risk from the Age x to x + 1.	Died between the Ages x and x + 1.	Probability of Dying in the Year.	Probability of Surviving the Year.	Mean Duration of Life.
0	4654.0	324	.06962	.93038	52.62
1	4353.0	71	.01631	.98369	55.52
2	4297.5	34	.00791	.99209	55.44
3	4276.5	20	.00468	.99532	54.87
4	4255.5	21	.00494	.99506	54.13
5	4233.5	16	.00378	.99622	53.40
6	4198.5	15	.00357	.99643	52.60
7	4168.5	17	.00408	.99592	51.78
8	4143.0	18	.00434	.99566	50.99
9	4118.5	15	.00364	.99636	50.21
10	4100.0	25	.00610	.99390	49.39
11	4064.0	31	.00763	.99237	48.69
12	4037.5	19	.00471	.99529	48.07
13	4031.0	15	.00372	.99628	47.29
14	4014.5	17	.00423	.99577	46.47
15	4003.5	17	.00425	.99575	45.66
16	3984.5	26	.00653	.99347	44.85
17	3957.0	34	.00859	.99141	44.15
18	3910.0	27	.00691	.99309	43.52
19	3873.0	35	.00904	.99096	42.82
20	3835.0	30	.00782	.99218	42.21

TABLE III.—Both Sexes—Contd.

Age (x).	Number Exposed to the Risk from the Age x to x + 1.	Died between the Ages x and x + 1.	Probability of Dying in the Year.	Probability of Surviving the Year.	Mean Duration of Life.
21	3776.0	47	.01245	.98755	41.54
22	3717.5	31	.00834	.99166	41.05
23	3688.5	40	.01084	.98916	40.40
24	3638.0	32	.00880	.99120	39.83
25	3601.0	37	.01027	.98973	39.18
26	3550.5	36	.01014	.98986	38.58
27	3518.5	28	.00796	.99204	37.97
28	3483.5	35	.01005	.98995	37.27
29	3440.0	29	.00843	.99157	36.65
30	3400.0	33	.00970	.99030	35.96
31	3347.0	23	.00687	.99313	35.30
32	3316.0	32	.00965	.99035	34.54
33	3268.0	32	.00979	.99021	33.87
34	3229.5	22	.00681	.99319	33.20
35	3194.0	30	.00939	.99061	32.43
36	3143.0	35	.01114	.98886	31.73
37	3073.5	23	.00748	.99252	31.08
38	3023.0	28	.00926	.99074	30.31
39	2977.5	27	.00907	.99093	29.59
40	2927.5	43	.01469	.98531	28.86
41	2848.0	29	.01018	.98982	28.28
42	2791.0	30	.01075	.98925	27.57
43	2735.5	33	.01206	.98794	26.86
44	2652.0	25	.00943	.99057	26.18
45	2582.5	35	.01356	.98644	25.43
46	2507.5	36	.01436	.98564	24.77
47	2443.5	28	.01146	.98854	24.12
48	2373.5	27	.01138	.98862	23.40
49	2311.5	30	.01298	.98702	22.66
50	2250.0	37	.01644	.98356	21.95
51	2175.0	28	.01287	.98713	21.31
52	2112.0	20	.00947	.99053	20.58
53	2057.0	32	.01555	.98445	19.77
54	1991.0	43	.02160	.97840	19.08
55	1912.5	36	.01882	.98118	18.49
56	1840.5	44	.02391	.97609	17.83
57	1753.5	21	.01198	.98802	17.26
58	1688.5	42	.02487	.97513	16.46
59	1608.0	30	.01866	.98134	15.87
60	1548.5	34	.02196	.97804	15.16
61	1491.5	44	.02950	.97050	14.49
62	1425.0	42	.02947	.97053	13.91
63	1357.5	43	.03167	.96833	13.32
64	1289.5	44	.03412	.96588	12.74
65	1222.0	55	.04501	.95499	12.17

TABLE III.—Both Sexes—Contd.

Age (x).	Number Exposed to the Risk from the Age x to $x+1$.	Died between the Ages x and $x+1$.	Probability of Dying in the Year.	Probability of Surviving the Year.	Mean Duration of Life.
66	1142.0	40	.03503	.96497	11.72
67	1076.0	39	.03624	.96376	11.13
68	1009.5	52	.05151	.94849	10.53
69	936.5	49	.05232	.94768	10.08
70	867.0	49	.05652	.94348	9.61
71	795.0	49	.06163	.93837	9.15
72	723.5	36	.04976	.95024	8.72
73	672.0	45	.06696	.93304	8.15
74	615.0	55	.08943	.91057	7.70
75	548.5	49	.08934	.91066	7.41
76	492.0	39	.07927	.92073	7.08
77	442.5	43	.09718	.90282	6.65
78	376.5	35	.09296	.90704	6.31
79	342.0	31	.09064	.90936	5.91
80	301.0	33	.10963	.89037	5.45
81	259.5	42	.16185	.83815	5.06
82	206.5	26	.12591	.87409	4.93
83	172.0	27	.15698	.84302	4.57
84	141.5	22	.15547	.84453	4.33
85	116.5	26	.22317	.77683	4.04
86	86.5	16	.18497	.81503	4.05
87	66.0	14	.21212	.78788	3.86
88	48.5	12	.24742	.75258	3.77
89	34.5	6	.17391	.82609	3.84
90	27.5	7	.25455	.74545	3.54
91	19.5	3	.15385	.84615	3.58
92	15.0	4	.26667	.73333	3.14
93	9.5	1	.10526	.89474	3.10
94	7.5	2	.26667	.73333	2.41
95	5.0	1	.20000	.80000	2.10
96	3.0	—	—	—	—
97	2.0	—	—	—	—
98	2.0	—	—	—	—
99	2.0	—	—	—	—
100	2.0	—	—	—	—
101	1.5	—	—	—	—
102	1.0	—	—	—	—
103	1.0	—	—	—	—
104 .....	.5	—	—	—	—

TABLE IV.—Males.

Age.	MEAN DURATION OF LIFE.				
	Peerage Families.	English Table. Dr. Farr.	Equitable. Morgan.	Government Annuity. A. G. Finlaison.	Healthy Districts. Dr. Farr.
0	52.00	40.36	—	—	48.56
10	49.04	47.47	48.32	45.57	51.28
20	41.46	39.99	41.67	38.74	43.40
30	35.51	33.21	34.53	33.39	36.45
40	28.33	26.46	27.40	27.12	29.29
50	21.40	19.87	20.36	20.53	22.03
60	14.56	13.60	13.91	14.41	15.06
70	8.77	8.55	8.70	9.08	9.37
80	4.58	4.97	4.75	5.22	5.37
90	1.64	2.80	2.56	2.78	2.99

Age.	ANNUAL MORTALITY PER CENT.			
	Peerage Families.	English Table. Dr. Farr.	Equitable. Morgan.	Government Annuity. A. G. Finlaison.
Under 5	2.227	7.072	—	—
5 to 9 ....	.345	.926	—	.718
10—19 ....	.536	.581	—	.742
20—29	1.046	.882	.749	1.315
30—39 ....	.870	1.094	.928	1.216
40—49	1.227	1.487	1.243	1.368
50—59	1.764	2.275	2.111	2.269
60—69	3.757	4.654	4.304	3.971
70—79	8.714	10.012	8.994	8.685
80—89	23.836	21.786	20.786	18.600

TABLE V.—Females.

Age.	MEAN DURATION OF LIFE.			
	Peerage Families.	English Table. Dr. Farr.	Government Annuity. A. G. Finlaison.	Healthy Districts. Dr. Farr.
0	53.71	42.04	—	49.45
10	50.16	47.86	50.07	50.88
20	43.48	40.65	43.27	43.50
30	36.82	34.06	36.65	36.85
40	29.93	27.50	29.91	30.00
50	23.08	20.84	22.99	22.87
60	16.42	14.49	16.17	15.69
70	11.28	9.12	10.14	9.85
80	6.92	5.34	5.69	5.64
90	4.10	3.09	2.94	3.11

TABLE V.—Females—Contd.

Age.	ANNUAL MORTALITY PER CENT.		
	Peerage Families.	English Table. Dr. Farr.	Government Annuityants. A. G. Finlaison.
Under 5	1.882	6.037	—
5 to 9 ....	.440	.900	.668
10—19 ....	.716	.639	.648
20—29 ....	.830	.917	.850
30—39 ....	.921	1.120	.995
40—49	1.179	1.389	1.149
50—59	1.708	2.107	1.621
60—69	3.508	4.079	3.063
70—79	6.092	9.095	7.119
80—89	11.601	19.461	16.724

TABLE VI.—Both Sexes.

Age.	MEAN DURATION OF LIFE.		
	Peerage Families.	Carlisle.	Healthy Districts.
0.....	52.62	38.72	49.00
10.....	49.39	48.82	51.08
20.....	42.21	41.46	43.45
30.....	35.96	34.34	36.64
40.....	28.86	27.61	29.64
50.....	21.95	21.11	22.44
60.....	15.16	14.34	15.37
70.....	9.61	9.18	9.61
80.....	5.45	5.51	5.51
90.....	3.54	3.28	3.05

Age.	ANNUAL MORTALITY PER CENT.	
	Peerage Families.	Carlisle.
Under 5	2.069	7.324
5 to 9 ....	.388	1.011
10—19 ....	.617	.588
20—29 ....	.951	.761
30—39 ....	.892	1.053
40—49	1.208	1.423
50—59	1.742	1.863
60—69	3.668	4.082
70—79	7.737	8.801
80—89	17.514	17.262

TABLE VII.—Peerage Families.

Age.	MEAN DURATION OF LIFE.	
	Males.	Females.
0.....	52.00	53.71
10.....	49.04	50.16
20.....	41.46	43.48
30.....	35.51	36.82
40.....	28.33	29.93
50.....	21.40	23.08
60.....	14.56	16.42
70.....	8.77	11.28
80.....	4.58	6.92
90.....	1.64	4.10

Age.	ANNUAL MORTALITY PER CENT.	
	Males.	Females.
Under 5	2.23	1.88
5 to 9 ....	.35	.44
10—14 ....	.41	.66
15—19 ....	.66	.77
20—24	1.10	.79
25—29 ....	.99	.87
30—39 ....	.87	.92
40—49	1.23	1.18
50—59	1.76	1.71
60—69	3.76	3.51
70—79	8.71	6.09
80—89	23.84	11.60

On the SUBJECT MATTERS and METHODS of COMPETITIVE EXAMINATIONS for the PUBLIC SERVICE. By EDWIN CHADWICK, Esq., C.B.

[Read before Section (F), at Cambridge, October, 1862.]

THE principle of competitive examinations on an open and fair field, without favour, for junior appointments to the public service, was opened by myself, and discussed at two meetings of this section, first at Dublin and next at Leeds. It has been several times affirmed in Parliament, and has been carried into extensive practice. On the occasions to which I refer, the subject was developed as a branch of economic science, as a means of ensuring administrative efficiency, and avoiding the waste of force and public money. In that point of view we should maintain our observations on its practical applications. So far as those practical applications have proceeded, in the Indian Civil Service, and in miscellaneous services at home, the testimony of disinterested, impartial, and competent observers has been decisive. I say of disinterested observers, because most who have written and spoken against the principle, may be challenged on the score of interest or of partiality, as notorious profitters by political patronage, or expectants of it. Complaints, have indeed been made by some civil officers of the old school, whose own influence or patronage is narrowed by the application of the principle, that it has supplied men of a quality above their places, nothing being said of the notorious fact, that the old system of patronage appointments supplied men of a quality below their places, and below any places in which services were required of a quality needing payment; nothing being said either by these objectors in recognition of the fact that the places themselves, and the methods of doing business in them, require to be brought up to the capacities of more intelligent officers than have heretofore sufficed. As to the improved capacity gained for the public service by the application of the competitive principle, I may give a deal of statistical evidence. Out of an average of three hundred patronage appointed cadets at the Royal Military Academy, at Woolwich, for officers of Engineers and the Artillery, during the five years preceding the adoption of the principle of open competition for admission to the Academy, there were fifty who were after long and indulgent trial, and with a due regard to influential parents and patrons, dismissed for hopeless incapacity for the service of those scientific corps. During the five subsequent

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years, which have been years of the open competitive principle, there has not been one dismissal for incapacity. Moreover, the general standard of capacity has been advanced. An eminent professor of this university, who has taught as well under the patronage as under the competitive system at that academy, declares that the quality of mind, of the average of the cadets, has been largely improved by the competition, so much so that he considers that the present average quality of mind of the cadets there,—though the sorts of attainments are different, has been brought up to the average of the first class men of this university, which of itself is a great gain. Another result, the opposite to that which was confidently predicted, by the opponents to the principle, has been that the average physical power or bodily strength, instead of being diminished, is advanced beyond the average of their predecessors. Nevertheless though this is so, there is much in the subject matter of the examinations, and in the methods of conducting them, which in view of many who have paid attention to the subject require amendment for the sake of the principle itself. I am desirous, therefore, of raising a discussion in relation to those subject matters and methods, to obtain the results of, as much as possible, of the experience of members of the university who have been engaged in the important service of testing qualifications by means of open competitive examination.

In respect to the subject matters of examination for the most important competitions, I conceive that the civil service commissioners and the members of the council of military education could not, at the outset of the system, well do otherwise than adopt, as their subject matters of examination, the generally accepted course of a liberal education as nearly as was practicable. But it is one important effect of the principle of open competition, and of the practical arrangements in connection with it, that it must bring scholastic systems and principles of education and subject matters more closely than heretofore, directly in the front of actual practice, and into harmony with the practical requirements of the country.

I may go further and say that, instead of adopting any of the accustomed academic courses, the experience of the public requirements of the service must fashion those courses to the service required. It may, however, be submitted to be for the advantage of academic institutions that it should do so. The requirements for the leading competitions—those for the scientific corps of the army and the Indian civil service have led to the extension and formation of large preparatory schools, for giving training for those public examinations, which, for myself, I should have preferred to have given by our own chief public schools. The principal of one large public school advised a friend of mine who had a son to prepare for a competitive examination, to take him to one of the special preparatory

schools in preference, as being superior in efficiency for the special purpose. I believe that those schools are of considerable and increasing comparative efficiency, for this reason, that they are themselves, by the competitive principle, put under the most direct and powerful competition with each other. Not only do the schools compete, but each master of each head of competition, competes with the teachers of that same head of competition in all the other preparatory schools. I have made inquiries of the head masters of several of these successful training schools, and I may express a confident opinion that they would all agree in the importance of ridding the competitions to the uttermost of everything necessitating or favouring cram. They would next agree that the present topics of competition are too numerous. It is true that the competitor may take up a lesser number of heads than are put forth, but practically to permit, say five heads of competition, at the same time, amounts to prescribing five. Mr. Canon Moseley, in one of his reports, adduces evidence of the general fact that as you spread the requirements wide, so you get shallower or lower results on the average in each head of competition included.

The experienced heads of preparatory schools would, I believe, further agree that it is much better for teaching, and necessary for the avoidance of cram, as I should maintain that it is better for the public or for private service—that the requirements should be narrow but deep, rather than wide and shallow. In my opinion, it is a better test of intellectual capacity for the public service, to try the power of mastering one subject thoroughly, or a few things well, than of attaining many things only moderately or passably well. We are not, however, considering the extent of the requirements generally desirable, but what shall be the subjects of competition, for you may include as many as you please of accomplishments for pass or qualifying examinations, whilst you exclude them from competition. We throw open then for consideration, the existing requirements, and consider only those to be imparted for the future. If a man has this or the other attainment, forming part of a liberal course of education, it is said to be hard to deprive him of the benefit of its estimation. We are, however, considering not what he has but what he ought to have, not what may render him an accomplished member of elegant society but what will make him a good public servant, or in private service enable him to yield a full equivalent for the pay he receives and to sustain responsibility in leading positions. We shall come to a sounder decision on these questions, if, considering of professional service for ourselves, we consider of the qualities which we may need, and for which we are prepared to pay in case of need. These will be the qualities most required for the service of the state.

Considering how we may best reduce the number of subjects of

competition, I would propose first to omit history. A man ought to know the history of his own country, it is said. Yes, but we ought not to make a range of the events and characters of some thousand years of the past, and too much of the bad, the subject of competition, at the expense of proficiency in one or other of the sciences,—the purer and the better. Moreover, history as a topic is one great field of cram, of reliance on memory, and of dodging.

The next subjects which I submit for omission are the literatures of different countries. Ought not a gentleman to be versed in polite literature, it is said? Certainly; but it is not needful that it should be the subject of competition, at the expense of proficiency in other and indisputably better and more needed subject matters of training. Literature is moreover another great field of cram and dodging examinations, giving opportunities of trick, yielding chances to the idle who have read for amusement, over the diligent, who have laboured for the serious business of life. The literatures may be left for cultivation to social influences, and to their own attractions and advantages as recreations. As tests, moreover, they are of an inferior order. These two heads, histories and literatures, being dismissed as subjects of competition, we come to those which are admitted as means of mental training and superior tests of aptitude. First in appointed order are the mathematics. It is submitted that taking them as a main test, whilst the basis of examination is made narrower, it should be made deeper or rather longer, and that double the time should be given to it, two days instead of one, four days in place of two. This would have the advantage of giving the slow but sure a fairer chance against the quick, and may be the superficial, and would render the examinations less painful to the nervous.

One opinion I find increasing in strength is that greater prominence should be given to the experimental sciences, and that indeed, for the scientific corps of the army they should be made the chief topic for competition, and of course for preparatory education. The grounds of this opinion are that mental exercises in the experimental sciences include exercises of the faculties in induction as well as in deduction;—that eminence in the pure mathematics has not been in this country, or in France, accompanied by equal eminence in the applied mathematics, or in practical science, in the public service; that the experimental scientist is non-practical;—that if it were put to a chief of engineers, or to a mechanical or eminent civil engineer in this country, which of two competitors he would choose as an assistant, the one who was eminent in pure mathematics, or the one who was eminent in the experimental sciences, the latter would from experience be the one chosen. I confess that I give a strong preference to the experimental sciences, from what I know of the failures of the French engineers, who are pre-eminent

in pure mathematics, and from what I know of the failures of pure mathematicians at home, of which I could give, and have, indeed, elsewhere given examples. As a mental exercise, I must consider that exercises in logic might well take the place of much of mathematics, and for this reason—that I find skill in clear logical examination and exposition, and arrangement of business, to be rare qualifications amongst candidates for the public service. You want some subject matters of business frequently examined and clearly arranged, and yet how few you can find who can do anything you want to have done well—you find few who can analyse and abridge evidence well. Index making requires logical analysis to do it well, yet how few really good indexes we get. But it is impossible to look at French administrative and legislative documents, or at French scientific treatises, without being struck with their logical arrangement and clearness of exposition; and we find, in almost every curriculum of a French course of superior education, logic placed in a foremost rank, and we see its influence. In olden time, when logic was more cultivated in the English universities, we may trace its influence, in legal and clerical expositions, in greater clearness of arrangement and force of exposition than we now find prevalent.

Keeping in view the general proposition that it is requisite to reduce the topics for competition, there is now presented for consideration which language, dead or living, shall be the subject of pass, or merely qualifying examinations; and which, the subject of competition as a test of qualifications for the public service? As an officer who has, in his time, had much to do with the selection of gentlemen, men of liberal education, for first-class officers, and with their subsequent direction, I answer at once that the chief competition ought now to be in the vernacular, for the following reasons:—First, the small proportion who are found to write the mother tongue well and clearly. Out of several hundred gentlemen, sons of persons of wealth, who were examined for direct commissions in the army, the majority were plucked for bad English, for bad spelling, in fact for want of a common knowledge of the mother tongue. The bad English of the despatches of generals and superior officers in the Crimean war was notorious. King's and Queen's speeches are presentable as examples of bad English. It may be pleaded that these failures were not all by children of the university. But it was a subject of observation, that the translation of the most of them, were university statutes into English sent to the university commissioners, —translations by men of high classical attainments, into English which would not have been creditable to the scholars of a poor grammar school. Mr. D'Orsey, a member of the university, has advocated the urgent necessity of the special study of English. In respect to the selection of a language as a mental exercise, the great

European philologist, Grim, prefers German to either Greek or Latin, but he prefers the English to the German. Dr. Latham and other philologists do the same. On such impartial and competent authority I would rely, making no pretensions to any of my own. Reserving the dead and foreign languages for pass, or qualifying examinations, we should reduce the heads of competition from five, including two histories of peoples, and two literatures of peoples, to the vernacular, to mathematics and to the experimental sciences, which I think would be approved by the present state of opinion on the part of those conversant with the subject, including some experienced heads of preparatory schools. By this arrangement cram would be so far reduced as to be well nigh abolished. The Duke of Cambridge and the Council of Military Education have made important advances in the direction which I advocate. They have separated the literatures from the languages, so as to enable competitors to compete in the languages alone. The results of these changes have, I believe, been such as to justify and require further advances to be made in the same direction.

At a MEETING of the COUNCIL of the STATISTICAL SOCIETY, held at the Rooms of the Society, 12, St. James's Square, on THURSDAY, 11th December, 1862, COLONEL SYKES, M.P., F.R.S., Vice-President, in the Chair, the following communication from WILLIAM NEWMARCH, Esq., F.R.S., was read.

"My acceptance of duties in one of the largest Banking Houses in the city of London, which will prevent me from attending effectively to the work which devolves on the Editor of the Statistical Society's *Journal*, and on the acting Honorary Secretary of the Society, renders it necessary for me to place in the hands of the Council my appointment to both these offices—received from them nearly six years ago.

"I do not tender this resignation without some regret, for I had become, in many ways, attached to occupations which enabled me, at least in some humble degree, to promote the progress of sound knowledge on many of the most important and interesting problems of our time.

"I have taken care that the gentleman who may be appointed to succeed me, shall not find in either of my departments of duty any arrears,—but that on the contrary, he shall find such arrangements completed, or in progress, as will carry on the business of the Society in the usual manner for a few months in advance of the present time.

"As shortly as possible, I will refer to one or two topics upon which I may perhaps venture to place on record opinions not hastily adopted.

"First, as regards the character of the *Journal*. It has been my endeavour, with the concurrence of the Council, to render the contents of the *Journal* as varied and useful as possible—and to do so not merely by inserting the best of the Papers read before the Society itself, but also such other original and selected contributions as seemed likely to promote the cultivation of Statistics in an enlarged spirit and with a philosophic purpose. We have arrived at a time when the incessant labours of the last thirty or forty years should begin to bear fruit by enabling us to generalize many of our conclusions, and obtain a clear perception of the fundamental principles which should guide our researches. Several Papers will be found in recent volumes of the *Journal*, written with more or less of a clear perception of this aspect of our special field of inquiry, and probably there is no path which it is more incumbent upon us

to pursue with vigour, than the path which conducts us towards just conceptions of the philosophy of statistical methods and results.

"In the second place, it has been sought to render the *Journal* a dispassionate authority on as many of the important public questions which have arisen from time to time, as could be properly brought within the scope of the Society. A new science will best ascertain its own strength and failings, and best win the attention of mankind by dealing promptly and practically with the subjects within its own range, which happen to interest the world at large.

"In the third place, by means of a series of carefully framed Tables at the end of each Number, it has been sought to preserve in the *Journal* continuous observations, scientifically adjusted, of a considerable portion of the phenomena which indicate the social and material progress of the nation. It has been already found that these Tables framed and kept up on a plan of exact uniformity, have answered many useful purposes.

"In the fourth place, great care has been directed to the mechanical details of the *Journal*, and particularly to the form, size, and arrangement of every Tabular statement. The object has been to exclude every superfluous figure and mark. To admit everything essential to a sound judgment of the case—but to reject as positively mischievous, whatever was trivial or cumbrous. In order to reach the apprehension easily, the convenience of the eyesight of the reader has been studiously considered.

"The price of the *Journal* to the public was raised nearly 40 per cent. some time ago; but the enhanced price has not in any way diminished the sale; on the contrary, the demand for the *Journal* is on the increase.

"As concerns the general position of the Society, it must be regarded as gratifying that, notwithstanding the rapid growth of new learned societies which concern themselves with kindred subjects, we have been able to maintain, almost unimpaired, the standard of revenue and efficiency of the earlier periods of our career.

"I confess, however, that I have long entertained the opinion that the time has come when it will be found advantageous, and perhaps necessary, that the six or seven societies now existing in London for the cultivation of different branches of Social Science, should form themselves into a Federation, not so complete as to be subversive of individual independence, but sufficiently compact to secure the great objects of (1) concentrated libraries and places of meeting; (2) economy in management and expenses; (3) moral and intellectual power arising from the combination of several parts into one consistent whole.

"Several members of the Council will remember that at various times during the last two years, I have suggested the desirableness

of an arrangement of the kind now indicated, and that some progress has been made in the consideration of details.

"I employ, without any hesitation, the phrase *Social Science*, not perhaps as the most exact term that could be found, but as the title of a new branch of knowledge which has already acquired in the public apprehension, a definite place and a recognised function.

"There are in London at the present time the following seven societies, all engaged in one way or the other, in the cultivation of Social Science, viz.:—

- | | |
|----------------------------------|---|
| 1. Statistical Society. | 5. Reformatory Union. |
| 2. Institute of Actuaries. | 6. Association of Sanitary Officers. |
| 3. Juridical Society. | 7. National Association for promoting Social Science. |
| 4. Society for Amendment of Law. | |

"It seems to me that the manifest policy of these seven separate societies—to say nothing of manifest duty—is to form themselves into a powerful 'Institute of Social Science,' on the model of the British Association, and the Social Science Association:—that is to say, full sectional action and independence under the supervision of a central authority.

"It will be observed that in the list of societies just given, there is no provision for the investigation and discussion of questions of *Economic Science* as a separate and special pursuit; and yet sound Economic views are indispensable to the successful treatment of most of the subjects which engage the attention of the learned bodies now enumerated. There is, moreover, the striking anomaly that in the native land of Political Economy, and in the country which has done, and is doing, the most to discover its laws and illustrate their application, there is in the multitude of scientific associations, not one which specially cultivates a branch of knowledge so essentially English and practical. In France there have been for a long period the Academy of Moral and Political Sciences, besides other special means of promoting economical studies. An Institute of Social Science would be well able, by means of concentrated strength and resources, to establish a separate Section of Political Economy, and so supply a defect and a want which has been long confessed.

"It may be sufficient to say here, that conformity to at least four principles may be assumed to be indispensable in any efforts which may be made to establish a federal union of societies, viz., (1) that each existing society shall remain in possession of its own property, shall continue to be governed by its own internal rules, and shall continue to choose its own managers and officers; (2) that similar independence shall be preserved as regards the control of the publication of its own papers and proceedings; (3) that each meeting of each of the federated societies shall be open to the members of each of the other federated societies, so as to concentrate upon each

department the force of the entire body; and (4) that the authority to be exercised by the Officers and Council of the Federation itself, should be limited to the purposes and objects rather of advising than of actively interfering with, the associated societies.

"It has been stated that the Memorial to the late Prince Consort, to be erected at Kensington, will include a Hall or College available for the use of learned societies. If this statement should be verified, it is allowable to say that no plan would more happily fulfil some of the favourite schemes of the lamented Prince himself, than a union in his memory of those learned bodies which cultivate that Social Science which is so greatly beholden to him as a founder, guide, and expositor.

"As concerns the Meetings of the Society, I believe I shall be quite justified by the opinion of others, when I say that at no period in its history have the meetings of the Society been better attended than during the last five or six years; or have the discussions been more animated and instructive.

"As a Member of the Society—or if it be the pleasure of the Fellows, as a Member of the Council—I hope to have the satisfaction of still manifesting that constant interest in the welfare of the Society, which has become to me so confirmed a habit, that I should have some difficulty in shaking it off."

It was ordered that the preceding Minute be recorded in the proceedings of the Council, and it was Resolved unanimously—

"That the Council in accepting Mr. Newmarch's resignation of his offices of Honorary Secretary, and Editor of the *Journal*, desire to record their approbation of his valuable services in both those capacities. The Fellows generally are well aware of the practical and scientific character of the *Journal* under his Editorship, but the Council alone know how much credit is justly due to Mr. Newmarch. They thank him for the valuable suggestions which he has now made, and hope to be able to carry several of them into effect. They hear of the cause of his resignation with satisfaction, as in the position which he assumes, he will have an opportunity of successfully applying to the highest branch of the commerce of London, the sound financial principles which he has elucidated by his scientific papers. They heartily wish him success, and trust they shall receive his support in still further developing the usefulness of the Society, which owes so much to his zeal and labours."

It was also Resolved—

"That a Sub-Committee be now appointed to consider the suggested union of the learned Societies cultivating Social Science, to confer in a preliminary sense with the officers or leading members of the Societies indicated, and to report to a future Council.

"And that the Committee consist of Colonel Sykes, Dr. Farr Mr. Newmarch, and the Honorary Secretaries."

MISCELLANEA.

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I.—*Scotch Vital Statistics.*

"A NEW volume issued by the Registrar-General of Scotland gives the result of some inquiries upon several subjects of much interest. One among them is the fruitfulness of marriages. The usual mode of calculating is by observing the proportion of legitimate children in the year to the year's marriages; that proportion in Scotland, in the year under review, was considerably greater than in England or in France, and it is thought probable that the married Scottish women are more prolific than the English or the French. But an attempt has been made to ascertain the fruitfulness of every fruitful marriage. In Edinburgh the women who bore children in 1855 had borne altogether, upon an average, 3·7 children, and in Glasgow the proportion was 3·8; the largeness of the numbers in these cities gives the calculation a value much beyond that of any similar statistics hitherto published. So far as may be inferred from the returns at present obtained, it appears that the proportion of unfruitful marriages increases with a higher rank in life, and is probably less in Scotland than in England. Some curious facts came out in preparing the Glasgow table. One mother who was only 18 had four children, one who was 22 had seven children, and of two who were only 34, the one had thirteen and the other fourteen children; and, on the other hand, two women became mothers as late in life as 51, four at 52, and one mother was registered as having given birth to a child in the fifty-seventh year of her age. Another subject to which attention is called is the conspicuous proof upon these registers of the less waste of female life than of male; at every age, taking quinquennial periods up to 20, and then decennial, the proportional mortality among women in Scotland is less than that of men. There being no account of religious profession in the Scotch census, it is worthy of notice that in Scotland in 1856, of which the records are here furnished, out of every 100 marriages 47 were celebrated by clergymen of the Established Church of Scotland, 22 by the Free Church, 14 by the United Presbyterian (so commonly called the U. P.) Church, 9 by the Roman Catholic Church, not quite two by the Episcopal Church; and these numbers are considered roughly to indicate the proportion of population attached to each denomination. In elementary education Scotland is ahead of England; 88 per cent. of the men married and 76 per cent. of the women were able to sign the register in 1856. It is calculated that in that year, in addition to the emigration beyond the seas, a number as large—about 13,000—must have left Scotland for England and Ireland. Our northern neighbour sends us in this emigration many cool clear heads; she can boast and prove by tables and returns that brain diseases are very much less prevalent and fatal in Scotland than in England—a fact of which it would be interesting to know the cause. The inhabitants of towns in Scotland, it appears, are cut off by tubercular diseases in twice the proportion of those in the country—a circumstance

which seems to favour the doctrine that they are diseases of debility and imperfect assimilation. Of the excessive mortality of towns beyond that of the rural districts, nearly half occurs among infants under five years old. Without pursuing these topics further, we must notice that the volume does not close without a word for whiskey, 'the natural drink of Scotland,' as beer is that of England. In the year of which we are speaking, liver diseases cut off the English in the proportion of 34 in every 10,000 persons, and 35 in the previous year; while the Scotch were struck down in the proportion of only 26 in the one year and 27 in the other. It is suggested that further observations should be made, and that if they have the same result Chancellors of the Exchequer should lay these things to heart, and not be so ready to favour the consumption of beer and light wines to the prejudice of that which, after all, may prove to be a better beverage."

II.—*Topographical Department.*

"SIR H. JAMES has presented his annual report of the important works under his care. The sale of the maps to the public last year produced above 8,000*l*. The year saw completed the trigonometrical survey of the United Kingdom, which was begun in 1783, under General Roy. It is comprised in seven quarto volumes. Photo-zincography is more and more proving its value; and a facsimile of 'Domesday Book' will be published county by county, or at least wherever any gentleman will guarantee to pay for fifty copies of any county. The art of photo-zincography, which has been discovered and applied for the purpose of making the detailed topographical plans of the kingdom, has thus led to the production of the facsimile of the most ancient survey and terrier of the kingdom, a document such as no other country in the world possesses. The publication of the edition of 1783 is said to have cost the Government 38,000*l*.; the types were destroyed by a fire in 1808, and copies are so expensive and so rare that few can either buy or even refer to one. But now, through this simple and inexpensive process, and by publishing in parts, any one can purchase the portion relating to the county in which he is more particularly interested, generally for 8*s*. or 10*s*., and the Government will not be put to any cost whatever. Authentic copies could be made of such documents as are required to be deposited in the public Record Office, and it is said that this would probably save an expenditure of 10,000*l*. a-year. The process is about to be introduced in India and in Canada. A proposition is under consideration for sending a photographer to Simancas, in Spain, to copy some of the dispatches in cypher deposited in the Royal Archives there, and which are supposed to relate to important events, some time before and after the reign of Elizabeth. A method has been discovered of producing a negative impression on paper, from which a single copy of a deed or other document can be printed on parchment in permanent ink, avoiding the necessity of transferring the negative copies to zinc or stone before printing. Sir H. James calls this art papyrography. It will be useful where a single copy of a document, or only two or three copies are wanted. Examples of it have been placed in the libraries of the Houses of Lords and Commons."

III.—*Traffic in the City.*

"At the present moment, when the question of the best means of relieving our crowded thoroughfares is creating considerable interest in the Court of Common Council, and in the City generally, the following return of the number of vehicles and persons ascertained to have entered the City *daily*, in the early part of the month of May, 1860, will, we doubt not, be of interest to our readers:—

	Number of Vehicles.	Number of Passengers in Vehicles.	Number of Foot Passengers.	Total Number of Passengers.
Aldersgate Street	2,052	4,952	21,060	26,012
Aldgate	4,978	12,548	42,574	55,122
Artillery Street	148	232	4,110	4,342
Bishopsgate „	3,461	19,388	34,160	53,548
Blackfriars Bridge.....	4,108	7,293	31,642	38,935
„ Pier	—	—	2,140	2,140
Blackwall Railway	—	—	7,032	7,032
Blomfield Street	719	1,260	10,052	11,312
Brook „	254	413	4,530	4,943
Catherine Wheel Alley	—	—	1,876	1,876
Chancery Lane	1,279	7,593	13,057	20,650
Church Street	257	375	2,530	2,905
Custom House Stairs	—	—	109	109
Devereux Court.....	—	—	4,466	4,466
Dyers' Hall Pier	—	—	1,439	1,439
Finsbury Place	3,451	11,060	27,024	38,084
Golden Lane	247	352	8,140	8,492
Half Moon Street.....	114	159	2,886	3,045
Harrow Alley	81	107	6,220	6,327
Hatton Garden	423	815	8,332	9,147
Haydon Square.....	262	456	2,333	2,789
Holborn Bars	9,060	36,094	41,610	77,704
Leather Lane.....	162	237	5,830	6,067
Little Moorfields	150	228	5,230	5,458
London Bridge	10,429	30,799	54,128	84,927
„ Wharf	—	—	1,110	1,110
Milton Street	215	357	4,580	4,937
Minories	2,456	3,571	18,208	21,779
Moor Lane	140	175	6,041	6,216
Paul's Wharf.....	—	—	1,271	1,271
Primrose Street.....	6	6	1,630	1,636
Ropemaker „	128	172	2,436	2,608
Rosemary Lane.....	384	571	3,034	3,605
Shades Pier	—	—	2,500	2,500
Skinner Street	61	86	2,006	2,092
Smithfield Bars	2,439	4,012	24,830	28,842
Somerset Street.....	584	932	7,210	8,142
Southwark Bridge.....	497	1,465	875	2,340
Stoney Lane	126	141	7,672	7,813
Sun Street.....	1,119	1,799	11,970	13,769
Swan Pier	—	—	3,835	3,835
„ Street	509	713	4,154	4,867
Temple Bar	2,159	13,724	36,950	50,674
Tower Stairs	—	—	197	197
Union Street.....	1,254	1,861	11,356	13,217
Victoria „	1,748	3,114	12,650	15,764
Whitecross Street	2,305	4,026	24,890	28,916
Widgate	—	—	3,620	3,620
Total	57,765	171,086	535,535	706,621

Note.—At the time this was taken, part of the pavement was up in Fleet Street, which had the effect of bringing less vehicles into the City through Temple Bar, and more than usual through Holborn Bars.

IV.—The Coal Trade.

“THE coal trade of Northumberland and Durham, which held its annual meeting last week, has issued its report of the state of the trade during 1861. ‘Nothing can demonstrate,’ the report says, ‘the yet healthy position of the trade more forcibly than the fact that, amid a collapse of industrious pursuits so widely extended, the demand for coal has not only not diminished, but increased. It may be true—the committee believe it to be true—that the returns of the year just ended do not equal those of 1860, but this cannot be attributed either to any great depression of prices, or to any of the ordinary drawbacks upon commercial prosperity. In fact, the prices in 1861 were only, on the average, 4*d.* per ton less than that of the preceding year. The average price of first-class household coal in the London market in 1861 was 19*s.* 5*d.* per ton; seconds, 17*s.* 2*d.* per ton. In 1860 the prices of first and second class coals respectively in the London market were 19*s.* 9*d.* and 17*s.* 6*d.* The rate of freights to London, on the average, exactly coincide in 1860 and 1861, being 6*s.* 10*d.* per ton. The report further states that it is now apparent in the face of the official returns of coals imported into London by sea, by railway, and by canal that those by railway are gradually increasing in a greater ratio than those by sea. The importation by sea from the northern district barely shows an increase over 1860; the total additional being only 8,381 tons; while the increase in 1861 upon coals by railway is no less than 164,957 tons. Of this increase about £3,000 tons are, however, upon coals from the county of Durham.’ The following are the returns of coal shipped from the northern ports:—

	Tons.
Coals sent to London up to December 31, 1861	3,373,901
„ „ „ „ 1860	3,365,317
1861—Increase	8,584
Coals sent coastwise up to December 31, 1861	3,031,494
„ „ „ „ 1860	2,902,032
1861—Increase	129,462
Coals exported up to December 31, 1861	3,959,252
„ „ „ „ 1860	3,751,740
1861—Increase	207,512
The total increase on the three branches is ...	345,658

For the article coke a similar increased demand is exhibited. It is as follows:—

	Tons.
Increase on coke—	
Sent to London up to December 31	1,347
„ coastwise.....	8,049
Exported.....	38,906
Total increase—Coke.....	48,302

Considerable anxiety has been manifested in the north this week with regard to the flooding of two collieries—the Monkwearmouth pit, in the county of Durham, and the Gosforth pit, in the county of Northumberland, by immense feeders of water breaking into the shaft. Down to Thursday night, though there had been no one injured or lost through those accidents, the rush of water into the shafts had not been entirely stopped, a large number of miners have been temporarily thrown out

of employment, and it is feared a good deal of damage will be done to those pits by the flow of water into the workings. The horses and ponies have been brought to bank."

V.—Exports of Manufactured Cotton to the East.

From the *Manchester Guardian* of the 14th January, 1863:—

"The following table, which we have received from an entirely reliable quarter, will enable our readers to note the progress of our exports to the chief ports of India from 1852 to 1862, both years inclusive:—

Exports to the Bay of Bengal

	Cotton Cloth.		Cotton Yarn.
	Plain Packages.	Printed Packages.	
			lb.
1852	92,880	4,624	16,330,967
'53	92,966	7,596	17,661,810
'54	143,520	6,883	18,384,329
'55	144,832	3,813	19,379,465
'56	140,034	9,345	17,913,512
'57	117,524	14,333	13,511,971
'58	208,980	11,057	24,878,424
'59	266,514	46,995	27,209,721
'60	210,537	14,267	23,124,969
'61	209,369	16,154	17,757,472
'62	137,864	20,594	11,246,617

Exports to Bombay.

	Cotton Cloth, Plain Packages.	Cotton Yarn.
		lb.
1852	59,081	6,438,738
'53	62,729	6,853,965
'54	79,177	6,349,305
'55	55,738	7,675,169
'56	61,729	4,592,084
'57	60,454	3,101,948
'58	124,227	8,877,957
'59	140,643	12,745,837
'60	117,103	4,561,124
'61	126,389	5,664,228
'62	80,057	4,802,465

"Here we see that in the four years following 1857, the average quantity of cotton cloth sent to Bombay was fully double that of the preceding four or five years; and that the average shipped to the Bay of Bengal in 1858, 1859, 1860, and 1861, exceeded by more than 60 per cent. the average of 1854, 1855, 1856, and 1857. The addition to printed calicoes and to cotton yarns was also large to that bay. The sudden and vast increase in 1858 was owing to two causes. 1. The panic of the preceding year had sunk prices here in so great a degree as to tempt merchants to expend large sums, especially in the purchase of articles for India,

whose power of absorption seemed to them unlimited. 2. The military expenditure for the suppression of the mutiny created a special demand for our manufactures in 1858, to the enrichment of the consigners. It would be natural to suppose that the wide-spread impoverishment of the peninsula by the civil war would greatly diminish the demand for calico; and such must certainly have been the case. But it will be seen that shipments went on increasing against reason; and the markets became hugely overstocked, and the prices ruinously reduced. Some time after the restoration of peace indeed, various public works were commenced, and a rise of wages set in, which led to an augmented demand for our products; but supplies were poured into the country in such superabundance as not only prevented prices from becoming remunerative, but kept them so much below that point as to involve the certainty of such losses upon the enormous stocks in the ports as, added to previous losses, must have brought on an Eastern crisis of a very serious character if the war in America had not greatly curtailed the supplies in 1862, and given a highly remunerative value to the stocks on hand. Throughout the greater part of last year, however, but especially in the latter half of it, the shipments hence have been at prices that must ensure heavy losses to the owners, unless the stoppage of cotton from America should last long enough to save them. Prices are now about 50 per cent. above the general range for some years prior to the arrestment of the cotton supply; and this must diminish the consumption in something like an equal ratio. This consideration is not sufficiently borne in mind by those who are impatient at the little further improvement of which we are advised by each successive mail."

VI.—Note on Mr. Lumley's Paper on l'Union du Crédit de Bruxelles.

In vol. xx. of the *Journal* of the Society, p. 61, is printed "An Account of the Banking Establishment in Belgium, termed l'Union du Crédit de Bruxelles," read before the Society in Jan, 1857, by Mr. Lumley, one of the Honorary Secretaries. An account of the same Society, drawn up by M. T. Haack, of Brussels, in terms much the same as those used by Mr. Lumley, appears in the volume of the "Transactions of the National Association for the Promotion of Social Science, for 1862." The progress of the Society is there shown to the end of 1861, six years beyond the last year referred to in Mr. Lumley's account.

VII.—Note upon a Paper on the Income Tax, in the *Journal* of the Statistical Society for September, 1862.

"In the *Journal* of this Society for September 1862, there occurs a paper by Mr. William Lucas Sargant, the title of which is 'An Undiscriminating Income Tax Reconsidered.'

"The author has referred at its commencement to various principles upon the subject which have been advocated by different writers. Again, in section x, entitled 'Strictures on Distinguished Opinions,' the author of those various opinions are cited by name.

"Mr. Sargant seems not to have been aware that the principle which he enunciates as his own view was already in print many years ago. I refer to the pamphlet, *Thoughts on the Principles of Taxation, with Reference to a Property Tax and its Exceptions*. By Charles Babbage, Esq., 8vo., 1819; second edition, 1851; third edition, 1852.

"At the adjourned discussion* of Mr. Sargant's paper on an Income Tax, during

* Mr. Sargant was not present at the adjourned discussion.

one of the evening meetings of the Statistical Society, I stated distinctly my own views on the subject.

"Soon after the publication of my essay, during a short visit to Paris, M. Passy, the Minister of Finance, invited me to call at his office, that we might talk over the subject. I was much gratified to find that distinguished financier agreeing with me entirely in the justice of the principle and even in a great number of the details.

"Shortly after the publication of my pamphlet, the Minister of Finance to the King of Sardinia caused an Italian translation of it to be prepared and published at Turin.

"12th Feb., 1863."

"C. BABBAGE."

[It will be satisfactory to Mr. Sargent to learn that the opinion he entertains is supported by such high authority. It is necessary, however, to state that Mr. Sargent never saw, nor heard of Mr. Babbage's pamphlet.—ED. S. J.]

VIII.—The New Statistical Abstract for France.

FROM the *Economist* of the 21st February, 1863:—

"Following the example of the English Board of Trade, the French Ministry of Commerce has just issued a 'Statistical Abstract' for France,* relating to the period of fifteen years from 1847 to 1861.

"Leaving the facts to speak for themselves, we proceed to glance briefly at the most important points presented to notice in the French abstract, in the following order:—

1. Population, Production, &c.
2. Commerce. And
3. Navigation.

"1. Population, Production, &c.

"*Population*.—The area of France in the year 1861, was 209,420 square miles, and the total population 37,382,000 persons, giving a mean population of 179 persons to the square mile. These figures include the departments of Savoy and Nice, and consequently prevent any comparison being made with previous census returns. The increase in the population of France (exclusive of Savoy and Nice) in the decennial period between 1816 and 1856, was only 2·23 per cent. In England and Wales the increase according to the last census, was 12 per cent.; and in Scotland 6 per cent.; and the density of population was 344 persons to the square mile in England and Wales, and 98 in Scotland.

"*Distribution of the Soil of France*.—Exclusive of the departments of Savoy and Nice, from which no returns have been received, the soil of France is divided as follows:—

	Pr. cent.
Under cultivation:—	
Grain crops.....	28·30
Other „.....	5·00
Artificial meadows.....	5·00
Fallow.....	10·80
Natural meadows.....	9·50
Vineyards.....	4·10
Chestnuts, olives, mulberry, &c.	0·20
Pasture and waste lands.....	13·50
Forest, water, roads, houses, and uncultivated.....	23·60
	100·00

* *Situation Economique et Commerciale de la France*. Paris, 1862.

"*Live Stock*.—The total number of each kind of live stock in France (exclusive of Savoy and Nice) is estimated as follows:—

Horses	3,000,000
Asses	400,000
Mules.....	330,000
Horned cattle	10,094,000
Calves	4,104,000
Sheep and lambs	35,000,000
Goats and kids	1,400,000
Swine above one year	1,400,000
Sucking pigs and young wild boars	4,000,000

(Only between one-fourth and one-fifth of the total number of sheep are of the ordinary kind, the remainder being merinos or of mixed breed).

"*Wheat*.—The production of wheat during the period from 1847 to 1861, varied from 23½ million quarters in 1853 to 37¾ million quarters 1857. In 1861, the year in which the largest area was under wheat cultivation, the produce was only 25¾ million quarters. The greatest yield per acre during the period was in 1857, and the smallest in 1861.

"It is not, perhaps, generally known, that France derives a far greater part of her supply of meat from abroad than England does, and this under the old protective system. The average importations for consumption in the years from 1856 to 1860, in the two countries were as follows:—

	United Kingdom.	France.
	No.	No.
Oxen, bulls, cows, and calves	90,500	126,200
Sheep and lambs.....	213,000	402,000

"This fact is worthy the attention of the French Government, as it is well known that the adoption of free-trade principles tends to direct the attention of producers to manufactures, and the Government should lose no opportunity of stimulating the agricultural resources of the country, which will prove equally remunerative to the farmer under the new commercial system.

"*Wine*.—The mean annual production of wine in France, is 1,089,000,000 gallons. Of this quantity 67 per cent. is consumed in the country, leaving 33 per cent. for exportation.

"*Silk*.—The production of silk has greatly diminished of late years; the annual average production of cocoons from 1846 to 1852, was 53 million lbs., which had diminished from 1858 to 1861 to 26½ million lbs.

"*Mines*.—The production of coal in 1861, was about 8 million tons; of cast iron, 856,000 tons; of wrought iron (merchant), 520,000 tons; of rails, 106,000 tons; of iron plates 69,000 tons; of iron wire 24,000 tons; and of steel, 20,000 tons. The value of these was between 18 and 19 millions sterling. The value of other metals produced was about 2½ millions sterling.

"In the period from 1847 to 1859, the average price of coal at the place of production increased 31 per cent., the average price being in 1859, 10s. 1d. per ton. The price of cast iron made by charcoal and by coal diminished by about 20 per cent. during the same period. The price of wrought iron made with charcoal diminished only 7 per cent., while that made with coal decreased by about 23 per cent. France imports annually from 5 to 6 million tons of coal from Belgium, England, and the Rhenish Provinces.

"*Salt*.—The production of salt increased from 572,000 tons in 1847 to 630,000 tons in 1861.

"*Sugar*.—The quantity of home made sugar entered for consumption, doubled during the period from 1847 to 1861, being 52 million kilogrammes in the former year, and 105 millions in the latter.

"*Tobacco*.—The increase in the quantity of tobacco manufactured by the Government and sold in France in 1860, as compared with 1847, amounted to 10 million kilogrammes, or 22 million lbs.

"*Machinery*.—Connected with the productive power of the country, as taking the place of so many able-bodied workmen, the increase in the steam motive power employed, affords some guide as to the progress of the industry of the country. In the year 1847, the total horse power of machinery so employed was only 145,807, but in 1859 it had increased to 513,092. The increase appears to have been divided generally between the various trades and manufactures of the country.

"*Means of Communication*.—The length of river, canal, and road communication in France, is stated as under:—

	Miles.
Rivers	5,899
Canals	2,919
Roads of all kinds	403,650

The tonnage of steam vessels engaged in the river navigation, increased from 21,134 tons in 1847 to 33,690 tons in 1859, the largest employment having been 51,097 tons in the year 1857. As might be expected, there was a decline in the number of passengers from 2½ millions to 1½ million, consequent upon the increased facilities of railway accommodation. There was, on the other hand, a large augmentation in the quality of goods conveyed, viz., from 880,000 tons in 1847, to 2,616,000 tons in 1859.

"*Railways*.—On the 31st December, 1861, 6,269 miles of railway were open in France, against 1,136 miles on the 31st December, 1847. The statistics of the number of passengers and weight of goods conveyed, only come down to the year 1859. The increase in that year over 1847, was 39½ million passengers—the total in 1859 being 52½ millions; and the increase in goods' traffic 16½ million tons—the total weight conveyed in 1859 being about 20 million tons.

"*Post Office*.—The number of letters sent by the post more than doubled between 1847 and 1861, being 126 millions in the former year and 274 millions in the latter. In the same year the number of printed papers transmitted by the post were 90 millions in 1847, and 189 millions in 1861. The total receipts were 1,920,000*l.* in 1847, and 2,440,000*l.* in 1861.

"*Electric Telegraphs*.—In the year 1851, only 9,014 private messages were despatched, producing a receipt of 3,080*l.*; and in the year 1860, no less than 711,652 messages were sent, and 165,760*l.* received. Of the total number in 1860, 562,531 messages were used in France, and 149,121 sent to foreign countries.

"*Coinage*.—The total value of gold coined in France in the period from 1847 to 1861 inclusive, was 181,693,000*l.*, and of silver 30,235,000*l.*

"*Savings' Banks*.—The total number of savings' banks in 1847 was 345, and the number of accounts open on the 31st December in the same year 736,591. In 1860 the number of banks increased to 433, and the accounts open to 1,218,122."

MARRIAGES, BIRTHS, AND DEATHS IN GREAT BRITAIN.

No. I.—ENGLAND AND WALES.

MARRIAGES DURING THE THIRD QUARTER (JULY—SEPTEMBER), AND OF THE BIRTHS AND DEATHS DURING THE FOURTH QUARTER (OCTOBER—DECEMBER), OF 1862.

The general aspect of the returns cannot be pronounced "moderately good." Though the marriage-rate was fairly maintained in London and some other parts, it was so much depressed in Lancashire that the general result was lower than the average. The growth of the population did not suffer by failure of the natural supply, for births were numerous in the last three months, as they were during the whole of last year. But the deaths were also numerous. The rate of mortality was above the average; and apparently the principal cause of this excess was the cold weather of November, which carried off many persons in all parts of the country.

MARRIAGES. —There were 40,585 marriages in the third quarter of the year. In London the number rose from 7,703 and 7,347 in the third quarter of 1860-1 to 8,067 in the same period of 1862. This increase occurred at a time when the Exhibition was an inducement to part of the permanent population to remain in town, and attracted strangers from the provinces, and more distant parts, to spend some weeks of leisure within a convenient distance of its precincts.

ENGLAND:—MARRIAGES, BIRTHS, and DEATHS, returned in the Years 1856-62, and in the QUARTERS of those Years.

Calendar Years, 1856-62:—Numbers.

Years	'62.	'61.	'60.	'59.	'58.	'57.	'56.
Marriages No.	—	163,745	170,156	167,723	156,070	159,097	159,337
Births..... "	711,691	695,562	684,048	689,881	655,481	663,071	657,453
Deaths..... "	436,514	435,337	422,721	440,781	449,656	419,815	390,506

QUARTERS of each Calendar Year 1856-62.

(I.) MARRIAGES:—Numbers.

Qrs. ended last day of	'62.	'61.	'60.	'59.	'58.	'57.	'56.
March .....No.	33,976	33,401	35,150	35,382	29,918	33,321	33,427
June "	40,771	41,966	43,777	42,042	39,890	41,267	38,820
Septmbr..... "	40,585	39,892	40,541	39,803	38,599	38,669	39,089
Decmbr. "	—	48,486	50,688	50,496	47,663	45,840	48,001

QUARTERS of each Calendar Year, 1856-62.

(II.) BIRTHS:—Numbers.

Qrs. ended last day of	'62.	'61.	'60.	'59.	'58.	'57.	'56.
March.....No.	182,005	173,170	183,180	175,532	170,959	170,430	169,239
June.....,,	185,638	184,718	174,028	175,864	169,115	170,444	173,263
Septmbr.....,,	172,237	171,500	164,121	168,394	157,445	161,181	157,402
Decmbr.,,	171,811	166,174	162,719	170,091	157,962	161,016	157,478

(III.) DEATHS:—Numbers.

Qrs. ended last day of	'62.	'61.	'60.	'59.	'58.	'57.	'56.
March.....No.	122,192	121,713	122,617	121,580	125,819	108,665	103,014
June.....,,	107,555	107,721	110,869	105,631	107,142	100,046	100,099
Septmbr.....,,	92,225	100,986	86,312	104,216	98,142	100,528	91,153
Decmbr.,,	114,542	104,917	102,923	109,354	118,553	110,576	96,238

In Lancashire the marriages, which were 6,315 and 6,123 in the third quarter of 1860-1 respectively, declined to 5,468 in that of last year. The following are some of the more important districts in that county, with the number of marriages in the quarter ending 30th September of each of the last three years:—

	1860.	1861.	1862.
Bolton	287	301	235
Bury	229	185	167
Chorlton	142	128	139
Salford	161	154	141
Manchester	1,194	1,155	1,019
Ashton	350	365	222
Oldham	243	221	184
Rochdale	218	221	158
Burnley	204	184	175
Blackburn	338	306	243
Preston	298	256	249

ENGLAND:—Annual Rate Per Cent. of PERSONS MARRIED, BIRTHS, and DEATHS, during the YEARS 1856-62, and the QUARTERS of those Years.

Calendar YEARS, 1856-62:—General Percentage Results.

YEARS	'62.	Mean '52-'61.	'61.	'60.	'59.	'58.	'57.	'56.
Estmtd. Popln. of England in thousands in middle of each Year....	20,337	—	20,119	19,903	19,687	19,471	19,257	19,043
Persons Married Per cent.	—	1·684	1·628	1·710	1·704	1·604	1·652	1·674
Births,,	3·500	3·420	3·457	3·437	3·504	3·366	3·443	3·453
Deaths.....,,	2·146	2·221	2·164	2·124	2·239	2·309	2·180	2·051

QUARTERS of each Calendar Year, 1856-62.

(I.) PERSONS MARRIED:—Percentages.

Qrs. ended last day of	'62.	Mean '52-'61.	'61.	'60.	'59.	'58.	'57.	'56.
March.....Per ct.	1·360	1·405	1·352	1·422	1·464	1·252	1·410	1·414
June.....,,	1·610	1·709	1·676	1·766	1·716	1·646	1·722	1·638
Septmbr.,,	1·582	1·616	1·572	1·614	1·602	1·570	1·592	1·626
Decmbr.,,	—	1·991	1·904	2·012	2·026	1·934	1·880	1·992

(II.) BIRTHS:—Percentages.

Qrs. ended last day of	'62.	Mean '52-'61.	'61.	'60.	'59.	'58.	'57.	'56.
March.....Per ct.	3·644	3·588	3·505	3·707	3·631	3·576	3·604	3·590
June.....,,	3·666	3·571	3·687	3·512	3·588	3·498	3·555	3·655
Septmbr.,,	3·356	3·285	3·377	3·267	3·389	3·204	3·316	3·276
Decmbr.,,	3·338	3·231	3·264	3·230	3·414	3·205	3·304	3·267

(III.) DEATHS:—Percentages.

Qrs. ended last day of	'62.	Mean '52-'61.	'61.	'60.	'59.	'58.	'57.	'56.
March.....Per ct.	2·447	2·489	2·463	2·481	2·515	2·631	2·298	2·179
June.....,,	2·124	2·201	2·150	2·237	2·155	2·210	2·087	2·111
Septmbr.,,	1·797	2·020	1·989	1·718	2·097	1·997	2·068	1·896
Decmbr.,,	2·226	2·171	2·061	2·043	2·195	2·406	2·269	1·997

The marriages in Stockport, in Cheshire, show a clear decrease in 1862; they were 291, 299, and 204.

It has been stated that Ashton-under-Lyne stands at the top of the scale of pauperism; and if marriages are expected to be fewest where distress is greatest, the returns fully justify that expectation. In Ashton the decrease on the two previous summers was no less than 38 per cent. Next in respect of decrease is Stockport, where it was 31 per cent. The marriages of Rochdale decreased 28 per cent.; of Chorley 28; of Leigh 25; of Blackburn 25; of Oldham 21; of Bolton 20; of Bury 19; of Manchester 13; of Salford 11 per cent. In Haslingden, Preston, Burnley, Wigan, they decreased 10 per cent. Chorlton showed a slight increase. When the marriage returns for the year are completed, they may be compared with the amount of pauperism, namely, the proportion which the persons relieved from the local rates and the funds of Relief Committees bore to the whole population.

BIRTHS.—The total number of children born in the autumn, i.e. the fourth quarter, was 171,811. In autumn the birth-rate is invariably lower than in either of the first two quarters; and it is generally lower than in the September quarter. But whatever may be the fluctuations of the birth-rate of season with season, or

year with year, is compared, the rule holds, not without deviation, but with tolerable constancy, that more children are enrolled in the birth-registers in any year than have been entered in that which preceded it; and the births in 1862 exceeded by more than 87,000 the number in 1852. The birth registration of last year, extending over a period of fifty-two weeks, was as great as it was ten years ago, in fifty-nine or sixty weeks.

In last quarter the annual birth-rate was 3.338 to a hundred of the population. It was higher than the average, which is 3.231. In London 23,783 children were born; in the North Western Counties, Cheshire, and Lancashire, the number was 26,444. The metropolis has a population in round numbers of 2,804,000; the manufacturing division has 2,936,000.

The birth-rate in Cheshire and Lancashire was 3.481 per cent.; it was higher than the birth-rate in England (3.338). In London the rate was 3.274, and therefore lower than the rate that prevailed in the entire English population. It rose as high as 3.558 in Yorkshire, 3.630 in the Northern Counties (Durham, Northumberland, Cumberland, and Westmorland); and it fell as low as 3.082 in the Welsh Division. The most prolific population is found in the coal-producing districts of the north, and the thriving ports on the Tyne and the Wear.

INCREASE OF POPULATION.—The births in the quarter exceeded the deaths in the same period by 57,269. Part of the accumulation is constantly lost in the stream of emigrants. In the three months 25,284 emigrants left ports in the United Kingdom at which there are Government Emigration Officers; and of these about ten thousand were of English origin.* In the last three months of 1861 the total number of emigrants was only 16,569.

The whole emigration of 1862 consisted of 121,214 persons, English Scotch, Irish, and Foreign, of whom 58,706 left the shores of the United Kingdom for the United States, 15,522 for the North American Colonies, 41,843 for the Australian Colonies, 5,143 for other places. England contributed more than a third part of the total number of emigrants. About 60,000 persons of Irish origin left in the year; and more than half of these went to the United States. The Scotch preferred Australasia.

Of married men there were 10,725; of married women 12,854; of the unmarried above 12 years of age there were 39,563 males, 24,240 females.

PRICES, THE WEATHER, AND PAUPERISM.—The price of wheat fell. The average price in the last quarter of the year was 48s. 2d. per quarter, which is less by 8s. 7d. than in the corresponding period of 1860, and less by 11s. 1d. than in that of 1861. The average price of the best potatoes was five pounds per ton, which is less by a pound than it was in the last quarter of the two previous years. The cheapness of this favourite and anti-scorbutic esculent was a fortunate circumstance for the workmen of Lancashire in the ruin of their trade.

In Mr. Glaisher's Remarks on the Weather, it will be seen that at Greenwich the quarter began with a warm period which lasted seventeen days; after which the weather was variable, but for the most part rather cold till the end of the month. November commenced with a few warm days, which were followed by a cold period that set in on the 6th and continued to the 2nd December, the mean temperature having been 4°·5 below the average. In the last twenty-nine days the air was as warm as it had previously been cold, the average excess having been 4°·5 daily.

The mean temperature of October was, with two exceptions, higher than it had been in the same month since 1847; that of November was lower than it had been in the same month since 1829, two Novembers excepted; and December was warmer than that month had been since 1843, with the exception of three Decembers in that period.

* From a Return with which the Registrar-General has been favoured by the Emigration Commissioners: the number returned as of English origin was 8,272, while the birthplace of 4,633 emigrants was not distinguished; in the above statement a proportional number of these has been added to those returned as of English origin.

At Greenwich the fall of rain in the year was 26.5 in., and a fourth part of it was in the last quarter. Both these quantities are rather more than their respective averages. The rain-fall in 1862 varied from 20.4 in. at Scarborough to 54.4 in. at Stonyhurst.

The average number of paupers relieved on the last day of each week in the quarter were:

Quarter ending 31st December, 1860; In-door, 115,158; Out-door, 673,680.
 " " " '61; " 128,533; " 716,096.
 " " " '62; " 132,663; " 907,493.

If the last of the three periods is compared with the first, the recipients of parochial aid increased by 251,318.

CONSOLS, PROVISIONS, PAUPERISM, and TEMPERATURE, in each of the Nine QUARTERS ended 31st December, 1862.

1 Quarters ending	2 Average Price of Consols (for Money).	3 Average Price of Wheat per Quarter in England and Wales.	4 Average Prices of Meat per lb. at Leadenhall and Newgate Markets (by the Carcase), with the Mean Prices.		6 Average Prices of Potatoes (York Regents) per Ton at Waterside Market, Southwark.	7 Pauperism. Quarterly Average of the Number of Paupers relieved on the last day of each week.		9 Mean Tem- pera- ture.
			Beef.	Mutton.		In-door.	Out-door.	
1860 31 Dec.	£ 93 ² / ₈	s. d. 56 9	d. d. d. 3 ¹ / ₂ —6 ¹ / ₂ 4 ¹ / ₈	d. d. d. 4 ³ / ₄ —6 ³ / ₄ 5 ³ / ₄	s. s. s. 115—130 122	115,158	673,680	42.6
1861 31 Mar.	91 ¹ / ₈	55 1	4—6 ¹ / ₂ 5 ¹ / ₈	5 ¹ / ₂ —7 ³ / ₄ 6 ³ / ₈	140—155 147	131,501	758,441	39.9
30 June	91 ¹ / ₈	54 9	4 ¹ / ₂ —6 ¹ / ₂ 5 ³ / ₈	5 ¹ / ₂ —7 ¹ / ₂ 6 ¹ / ₂	120—140 130	117,802	713,785	51.8
30 Sept.	91 ³ / ₈	52 1	4 ¹ / ₂ —6 ¹ / ₂ 5 ³ / ₈	4 ³ / ₈ —7 5 ³ / ₈	85—110 97	112,932	693,649	60.4
31 Dec.	93 ² / ₈	59 3	4—6 ¹ / ₂ 5 ¹ / ₈	4 ³ / ₄ —6 ³ / ₄ 5 ³ / ₄	110—130 120	128,533	716,096	45.5
1862 31 Mar.	93 ¹ / ₈	60 1	4—6 ¹ / ₂ 5 ¹ / ₈	4 ³ / ₄ —6 ¹ / ₂ 5 ³ / ₈	130—155 142	143,926	804,272	41.1
30 June	93 ² / ₈	56 8	4—6 5	5—7 6	180—200 190	127,863	781,858	53.3
30 Sept.	93 ² / ₈	56 10	4 ¹ / ₂ —6 ¹ / ₂ 5 ¹ / ₈	5 ¹ / ₂ —7 6 ¹ / ₈	100—130 115	119,592	789,914	58.7
31 Dec.	93 ³ / ₈	48 2	4—6 ¹ / ₂ 5 ¹ / ₈	5 ¹ / ₂ —6 ³ / ₄ 6	90—110 100	132,663	907,493	45.0

Col. 6 is deduced from the Weekly Tables published in the *Economist*. The average of the highest and of the lowest weekly 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 now relate to 651 Unions, &c., comprising a population of 19,864,912 (in 1861), 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, 1862, to—Insane Persons, 31,554; Vagrants, 1,542. The rest of the paupers on that day amounted to 817,800.

THE MORTALITY, AND THE STATE OF THE PUBLIC HEALTH.—The total number of deaths in the three months that ended 31st December, was 114,542. In the corresponding season of 1860 it was nearly 103,000; in that of the following year nearly 105,000. Though the last of these autumns was not as a whole colder than those which preceded it, the sudden invasion of cold in November, and the abrupt succession of heat account for its having been the most fatal. The death-rate was 2·226 per cent. against an average of 2·171. In the principal towns the rate of mortality in the quarter would have carried off 253 persons in a year out of a population of 10,000 (against an average of 247); and in the small towns and country parishes it would have carried off 192 out of a population of equal amount (against an average of 190).

The North-Western Counties, Yorkshire, London, the Northern Counties, the West Midland, are five divisions in which the highest rate of mortality prevailed. In the first, which contains the district of the cotton manufacture, the rate (2·66 per cent.) was higher than in any other division. This distinction is not of recent birth; it is not the fruit of adverse circumstances, but has sprung from causes which have been in operation since Liverpool, Manchester, and other towns in what has been called the worst drained part of England, rose into importance as

DEATHS in the Autumn Quarters, ended 31st September, 1855-62.—Numbers.

DEATHS, &c.	1862.	Total 1852-61, (10 Years.)	1861.	1860.	1859.	1858.	1857.	1856.	1855.
In 125 Districts and 23 Sub-districts, comprising the Chief Towns	64,322	571,601	57,631	56,756	57,409	63,596	60,132	52,086	51,5
In the remaining Districts and Sub-districts of England and Wales, comprising chiefly Small Towns and Country Parishes ...	50,220	480,515	47,286	46,167	51,945	52,957	50,444	44,153	44,2
All England	114,542	1,052,116	104,917	102,923	109,354	118,553	110,576	96,238	95,7

AREA, POPULATION, DEATHS, and MORTALITY per Cent. in the Autumn Quarter, ended 31st September, 1852-62.

GROUPS.	Area in Statute Acres. (England.)	Population Enumerated. (England.)		Deaths in 10 Autumn Quarters, 1852-61.	Average Annual Rate of Mortality per Cent. of 10 Autumn Quarters, 1852-61.	Annual Rate of Mortality per Cent. in the Autumn Quarter, 1862.
		March 31st, 1851.	April 8th, 1861.			
In 125 Districts, and 23 Sub-districts, comprising the Chief Towns	No. 2,149,768	No. 8,247,017	No. 9,806,780	No. 571,601	Per ct. 2·474	Per ct. 2·531
In the remaining Districts and Sub-districts of England and Wales, comprising chiefly Small Towns and Country Parishes	35,175,115	9,680,592	10,259,444	480,515	1·900	1·921
All England	37,324,883	17,927,609	20,066,224	1,052,116	2·171	2·226

seats of commerce and manufacture. But whatever be the sanitary condition of the towns and villages they inhabit, human beings must be affected by the atmosphere in which they are immersed, and the effects of which they can but partially control; and as the cotton districts participated with the rest of the kingdom in the benefit of a healthy summer, they have also suffered, like other parts, from a less healthy autumn. The mortality rose from 2·46 per cent., the mean rate of the two previous autumns, to 2·66 per cent., but in London it also rose from 2·22 to 2·44. Further, the mortality did not increase quite so much in Lancashire and Cheshire as it did in Yorkshire.

It will tend to strengthen the conclusion that the increase of mortality in Lancashire in the last quarter was not caused directly by famine, nor indirectly by diseases induced or aggravated by it, if it be stated, in addition to facts that have been mentioned above, that of the twenty-six districts, of which that county is composed, while a certain number exhibited an increase of deaths over those of the corresponding quarter in 1861, there was in an equal number of districts an actual decrease. The districts of Bolton, Manchester, Salford, Burnley, and Preston are amongst those that stand in the latter more favourable category. The munificence of the nation, aided by its kinsfolk in other lands, who "have brought their food from afar," has hitherto averted the last, direst extremity, the death of a people by famine. Amongst elements of the situation that have been conducive to health, are the cheapness of provisions, a winter in great part unusually mild, increase of maternal care, recreation out of doors, and perhaps, for many men and women who are not robust, a season of needful rest. The future of the "cotton-famine" is still undetermined,—in the language of the Central Executive Committee it may be even "full of gloom and uncertainty," and to "chill the sympathy or arrest the efforts" that have been evoked, would be rash,—but that which is past may be subject of congratulation; and it is now known that the history of the distress is not written in the death-register of the year that has closed.

The deaths in the district of Liverpool rose from 1,883 and 2,193, the numbers in the corresponding quarters of 1860-1, to 2,625 last quarter; those in West Derby rose from 1,111 and 1,472 to 1,726. A great part of this formidable increase has been caused by the ravages of scarlatina. This disease caused 50 out of 105 deaths in the Clowance sub-district in Devonshire. Of 203 deaths in Kingston (Portsea Island) no less than 126 were those of children from scarlatina or other fever, and croup. A very malignant form of scarlatina raised the deaths much above the average at Halstead, in Essex; and, it is reported, in many other parts. Diphtheria caused a third part of the mortality at Hailsham in Sussex, and it is stated that it has been very prevalent in South Walsham, in Norfolk where, out of 34 deaths from all causes, 13 were from this disease, and 9 of these occurred in the parish of Beighton. Diphtheria was very prevalent in Diss, Norfolk, and trebled the average mortality in the parish of Dickleburgh. Measles has been unusually rife and fatal in Falmouth; hardly a family with children escaped, and many adults were attacked by it.

MARRIAGES Registered in Quarters ended 30th September, 1862-60; and
BIRTHS and DEATHS in Quarters ended 31st December, 1862-60.

1 DIVISIONS. (England and Wales.)	2 AREA in Statute	3 POPULATION, 1861. (Persons.)	4 5 6 MARRIAGES in Quarters ended 30th September.		
			'62.	'61.	'60.
ENGLD. & WALES....Totals	Acres. 37,324,883	No. 20,066,224	No. 40,585	No. 39,892	No. 40,541
I. London	77,997	2,803,989	8,067	7,347	7,708
II. South-Eastern	4,065,935	1,847,661	3,489	3,236	3,184
III. South Midland	3,201,290	1,295,497	2,032	1,971	1,972
IV. Eastern	3,214,099	1,142,580	1,639	1,553	1,563
V. South-Western	4,993,660	1,835,714	3,351	3,371	3,260
VI. West Midland	3,865,332	2,436,568	4,872	4,625	4,860
VII. North Midland	3,540,797	1,288,928	2,113	2,120	2,253
VIII. North-Western	2,000,227	2,935,540	6,376	6,079	7,321
IX. Yorkshire	3,654,636	2,015,541	4,128	4,247	4,159
X. Northern	3,492,322	1,151,372	2,285	2,248	2,126
XI. Monmthsh. & Wales	5,218,588	1,312,834	2,233	2,095	2,135

7 DIVISIONS. (England and Wales.)	8 9 10 BIRTHS in Quarters ended 31st December.			11 12 13 DEATHS in Quarters ended 31st December.		
	'62.	'61.	'60.	'62.	'61.	'60.
ENGLD. & WALES....Totals	No. 171,811	No. 166,174	No. 162,719	No. 114,542	No. 104,917	No. 102,923
I. London	23,783	23,014	23,739	17,717	15,866	15,618
II. South-Eastern	15,057	14,442	13,717	8,895	8,452	8,161
III. South Midland	10,628	10,213	9,948	6,389	6,176	6,020
IV. Eastern	9,145	8,717	8,358	5,690	5,548	5,253
V. South-Western	14,824	13,711	13,441	8,826	8,479	8,301
VI. West Midland	21,329	20,999	20,308	14,306	11,792	12,020
VII. North Midland	10,980	10,764	10,580	6,401	6,068	5,889
VIII. North-Western	26,444	26,160	24,906	20,186	19,265	17,196
IX. Yorkshire	18,426	17,607	17,593	12,834	10,937	11,684
X. Northern	10,830	10,461	9,955	6,901	6,205	6,295
XI. Monmthsh. & Wales	10,365	10,086	10,174	6,397	6,129	6,486

REMARKS ON THE WEATHER

DURING THE QUARTER ENDING 31ST DECEMBER, 1862.

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

From the beginning of the quarter to the 17th the weather was warm, the excess of temperature amounting to $4\frac{1}{2}^{\circ}$ daily; and to $3\frac{1}{2}^{\circ}$ for the 35 days ending October 17th. On the 8th a variable period set in and continued to the 30th, the average deficiency of temperature was $1\frac{1}{2}^{\circ}$ daily. This was followed by a week of warm weather; a cold period set in on November 6th and continued to December 2nd, a deficiency of temperature being experienced of $4\frac{1}{2}^{\circ}$ daily; and from December 3rd to the end of the quarter there was an average excess to the same amount, viz., $4\frac{1}{2}^{\circ}$ daily.

The mean temperature of the month of October was $51^{\circ}8$, being higher than any October since 1847, with the exception of 1857 and 1861, which were $52^{\circ}9$ and $54^{\circ}9$ respectively.

The mean temperature of the month of November was $39^{\circ}8$, being lower than any November since 1829, with the exception of 1851 and 1858, which were $37^{\circ}9$ and $38^{\circ}6$ respectively.

The mean temperature of the month of December was $43^{\circ}6$, being higher than any December since 1843, excepting the years 1848, 1852, and 1857, which were $41^{\circ}0$, $47^{\circ}6$, and $45^{\circ}1$ respectively.

The mean high day temperature was $1^{\circ}9$ in excess in October, $3^{\circ}4$ in defect in November, and $3^{\circ}0$ in excess in December.

The mean low night temperature was $1^{\circ}7$ in excess in October, $3^{\circ}2$ in defect in November, and $3^{\circ}1$ in excess in December.

Therefore both the days and nights in October and December were warm, and in November both were cold.

The mean temperature of the air was $1^{\circ}4$ in excess in October, $4^{\circ}4$ in defect in November, and $3^{\circ}5$ in excess in December.

The mean temperature of the dew point was $2^{\circ}4$ in excess in October, $2^{\circ}6$ in defect in November, and $3^{\circ}4$ in excess in December.

The degree of humidity was above its average in the months of October and November, and in defect in December.

The pressure of the atmosphere was 0.03 in excess in October, 0.05 inch in excess in November, and 0.05 inch in excess in December.

The fall of rain was 4.0 inches in October, 1.0 inch in November, and 1.6 inch in December; the total fall for the quarter was 6.6 inches, being $\frac{1}{2}$ an inch above the average of the preceding 43 years.

The total fall of rain for the year 26.2 inches, being 1.2 inches above the average.

The fall of rain for the year 1862 has varied from 20·4 inches at Scarborough, to 54·4 inches at Stonylhurst.

The mean temperature of the air at Greenwich in the three months ending November, constituting the three autumn months, was 49°·8, being 0°·4 above the average of the preceding 91 years.

1862. Months.	Temperature of									Elastic Force of Vapour.		Weight of Vapour in a Cubic Foot of Air.		
	Air.			Evaporation.		Dew Point.		Air— Daily Range.		Water of the Thames				
	Mean.	Diff. from Average of 91 Years.	Diff. from Average of 21 Years.	Mean.	Diff. from Average of 21 Years.	Mean.	Diff. from Average of 21 Years.	Mean.	Diff. from Average of 21 Years.					
Oct.	51·8	+2·3	+1·4	50·2	+1·3	48·6	+2·4	11·9	+0·2	65·4	In. ·318	In. +·023	Gr. 3·8	Gr. +0·1
Nov.	39·8	-2·6	-4·4	38·8	-2·9	37·4	-2·6	11·5	-0·2	44·1	·224	-·029	2·5	-0·4
Dec.	43·6	+4·6	+3·5	42·1	-3·5	40·3	+3·4	9·4	-0·1	43·2	·250	+·029	2·8	+0·1
Mean.....	45·0	+1·4	+0·2	43·7	+0·8	42·1	+1·0	11·9	-0·0	47·2	·272	+·009	3·0	0·0

1862. Months.	Degree of Humidity.		Reading of Barometer.		Weight of a Cubic Foot of Air.		Rain.		Daily Horizontal Move- ment of the Air.	Reading of Thermometer on Gra				
	Mean.	Diff. from Average of 21 Years.	Mean.	Diff. from Average of 21 Years.	Mean.	Diff. from Average of 21 Years.	Amnt.	Diff. from Average of 46 Years.		Number of Nights it was			Low- est Read- ing at Night.	High- est Read- ing at Night.
										At or below 30°.	Be- tween 30° and 40°.	Above 40°.		
Oct.	89	+ 2	In. 29·726	+·029	Gr. 538	- 1	In. 4·0	In. +2·2	Miles. 283	3	9	19	25·0	52·5
Nov.	92	+ 3	29·793	+·046	553	+ 6	1·0	-1·4	172	14	12	4	18·0	47·4
Dec.	88	- 1	29·865	+·052	550	- 2	1·6	-0·3	324	9	15	7	27·6	47·7
Mean.....	89	+ 1	29·795	+·042	547	+ 1	Sum 6·6	Sum +0·5	Mean 261	Sum 26	Sum 36	Sum 30	Lowest 18·0	High- est 52·5

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

Belvoir Castle. Wheat sowing began about the middle of October, and a large quantity was sown before the end of the month; the seed time has, on the whole, been very good. Turnips, which seemed good at the commencement of the quarter, turned out very indifferent before the end. Very extraordinary crop of acorns. Potatoes going off. Horse chesnut and poplar trees divested of leaves on November 8th.

Bywell. The grain crops were secured along the banks of the Tyne early in October; they are in good condition, the yield being about the average. On high grounds there was grain uncut in the month of November. Potatoes much below an average crop; the quality is good, but there is a partial disease. Turnips looking well, and a fair crop.

ENGLAND.—Meteorological Table, Quarter ended 31st December, 1862.

1	2	3	4	5	6	7	8	9
NAMES OF STATIONS.	Mean Pressure of Dry Air reduced to the Level of the Sea.	Highest Reading of the Thermo- meter.	Lowest Reading of the Thermo- meter.	Range of Tem- perature in the Quarter.	Mean Monthly Range of Tem- perature.	Mean Daily Range of Tem- perature.	Mean Tem- perature of the Air.	Mean Degree of Hu- midity.
	in.	°	°	°	°	°	°	
Guernsey	29·710	69·0	37·0	32·0	21·0	6·1	49·3	83
Exeter	29·708	65·4	25·3	40·1	29·6	9·7	46·7	84
Ventnor	29·706	67·0	31·0	36·0	25·0	7·6	48·4	86
Barnstaple	29·682	67·5	27·0	40·5	31·3	10·7	47·5	85
Royal Observatory	29·689	71·7	24·8	46·9	33·0	11·9	45·0	89
Royston	29·685	69·8	24·2	45·6	32·6	9·2	44·0	90
Lampeter	29·681	68·0	16·2	51·8	37·3	14·0	44·6	86
Norwich	29·682	72·5	28·5	44·0	30·8	9·8	45·3	88
Belvoir Castle ...	29·664	70·5	22·5	48·0	33·8	12·3	43·5	88
Liverpool	29·675	64·4	29·7	34·7	27·2	7·7	45·9	85
Wakefield	29·670	70·4	17·2	53·2	37·3	13·3	43·6	86
Leeds	29·661	68·0	21·0	47·0	33·0	11·9	42·4	86
Stonyhurst	29·648	64·5	21·4	43·1	33·4	10·9	43·1	83
York	29·623	66·0	23·0	43·0	30·5	10·8	43·1	89
Scarborough	29·630	66·0	30·0	33·0	17·8	7·6	43·8	94
North Shields ...	29·580	66·3	24·8	41·5	29·6	8·3	49·1	85

10	11	12	13	14	15	16	17	18
NAMES OF STATIONS.	WIND.				Mean Amount of Cloud.	RAIN.		
	Mean estimated Strength.	Relative Proportion of				Number of Days on which it fell.	Amount collected.	
		N.	E.	S.	W.			
Guernsey	1·7	8	5	7	10	6·0	55	13·9
Exeter	1·2	8	5	8	10	5·6	66	7·2
Ventnor	—	5	8	8	10	—	34	11·6
Barnstaple	1·3	6	6	8	10	4·3	60	13·5
Royal Observatory	0·8	6	5	8	11	7·3	41	6·7
Royston	—	7	4	8	10	6·5	76	5·6
Lampeter	0·6	5	5	10	10	6·4	60	12·5
Norwich	1·6	5	6	8	11	6·9	40	5·8
Belvoir Castle ...	1·6	5	2	11	12	7·9	48	8·4
Liverpool	1·4	5	4	9	12	6·9	53	7·4
Wakefield	1·6	7	5	8	11	6·6	49	6·5
Leeds	1·3	5	4	11	11	7·6	47	5·9
Stonyhurst	0·8	7	6	6	11	7·0	59	15·7
York	—	5	5	6	15	—	—	5·0
Scarborough	2·7	5	4	9	12	—	21	2·7
North Shields ...	2·0	6	3	7	14	5·6	56	3·8

No. II.—SCOTLAND.

MARRIAGES, BIRTHS, AND DEATHS IN THE QUARTER
ENDED 31ST DECEMBER, 1862.

BIRTHS.—25,484 births were registered in Scotland during the fourth quarter of the year 1862, which gives the annual proportion of the quarter for 330 Births in every ten thousand persons of the estimated population, or one birth to every 30 persons. The mean annual proportion of births for the same quarter during the six previous years was 339 births in every ten thousand persons; so that the falling off in the number of births has been very marked during the fourth quarter of the year 1862. Low, however, as was the proportion of births during the closing quarter of 1852, it is considerably above the English average of births for the fourth quarter; the ten years' average annual birth-rate of the fourth quarter in England being 323 in every ten thousand persons. The English rate for the same quarter, however, exceeded that of Scotland; for during the fourth quarter of 1862, the births in England were in the proportion of 333 births in every ten thousand persons. Of the children born, 13,155 were boys, and 12,329 girls, being in the high proportion of 106·7 boys for every 100 girls.

The proportion of births in the town and country districts varied considerably. Thus, in the 126 town districts (embracing almost all the towns with a population of 2,000 and upwards,) 14,422 births were registered; while in the 881 country districts (embracing the remainder of the population of Scotland), the births amounted to 11,062, thus indicating an annual proportion for the quarter of 356 births in the towns, but only 303 births in the country districts, for every ten thousand persons in each of these respective divisions.

Of the 25,484 births, 22,956 were legitimate, and 2,528 illegitimate, being in the proportion of 1 illegitimate in every 10 births, or 9·9 per cent. of the births illegitimate. As usual, this proportion of illegitimate births was highest in the country, and lowest in the town, districts, being only 9·6 per cent. of the births in the town, but 10·2 per cent. of the births in the country, districts.

DEATHS.—16,145 deaths were registered in Scotland during the fourth quarter of 1862, being in the annual proportion of 209 deaths in every ten thousand of the estimated population, or one death in every 47 persons. This is a proportion considerably above the mean of the fourth quarter in the seven previous years, which only indicate a death-rate of 202 deaths in every ten thousand persons. The quarter has therefore been pre-eminently unhealthy; the fourth quarter of the year 1858 being the only one when the mortality equalled and exceeded it—the year of great commercial distress and want of employment for the labouring classes. High, however, as was the Scottish death-rate, it was higher still in England during the same quarter, the annual proportion of 222 deaths having occurred in England during the fourth quarter of 1862 for every ten thousand persons.

As usual, the deaths in the town districts greatly exceeded those in the country districts. Thus, in the 126 town districts, 10,423 deaths were registered, but only 5,722 in the 881 country districts, indicating an annual death-rate during the quarter of 257 deaths in the town districts in every ten thousand persons, but only 156 deaths in the town districts, in every ten thousand persons, but only 156 deaths in the country districts in a like population.

Of the deaths, 4,783 were registered in October, 5,209 in November, and 6,153 in December; thus indicating 154 deaths daily in Scotland during October, 173 daily during November, and 198 daily during December.

INCREASE OF POPULATION.—The births during the quarter exceeded the deaths by 9,339, and by that number the population would have increased had there been no emigration. During the quarter, however, the Emigration Commissioners ascertained that 25,284 persons emigrated from the ports of Great Britain and Ireland, of whom 2,958 were ascertained to be of Scottish origin. If to that

number be added 665, as the proportion of persons whose origin was not ascertained, the total number of Scottish emigrants would amount to 3,623 persons, which deducted from the excess of births over deaths, would leave only 5,716 as the increase of the population during the quarter.

MARRIAGES.—6,066 marriages were registered in Scotland during the quarter, being in the annual proportion of 78 marriages in every ten thousand of the estimated population. This is the lowest proportion of marriages which has occurred in Scotland during the fourth quarter since 1855; and the mean of that quarter for the seven previous years gives the proportion of 85 marriages in every ten thousand persons. This fact affords one of the strongest proofs which could be adduced of the general dulness of trade, and the consequent inability of the labouring classes to procure work. It has not been caused by the severity of the weather arresting out-of-door occupations; for though the weather has been stormy and boisterous, it has been mild and open, excepting for a few days in November. However great the Lancashire distress, therefore may have been, it is greatly to be feared that there are thousands in Scotland who, from the same causes, are suffering from the depression in trade and its consequent privations.

This depression in trade, and consequent falling off in the number of marriages, has been most strongly marked in the town districts, where all the great commercial activity exists, and has been comparatively unfelt by the rural districts. Thus, during the fourth quarter of 1861, the proportion of marriages in the town districts was 93 marriages in every ten thousand persons; but during the fourth quarter of 1862, the proportion was only 85 marriages in a like population. In the rural districts, the falling off in the proportion of the marriages was very much less, seeing that during the fourth quarter of 1861, the proportion was 74 marriages in every ten thousand persons; which only fell to 70 marriages in a like population during the fourth quarter of 1862.

HEALTH OF THE POPULATION.—Much sickness prevailed among the population during the quarter; and that to an extent even disproportioned to the deaths, numerous as they were.

WEATHER.—The weather has been rather peculiar during the quarter, and remarkable in this, that November had a mean temperature greatly below that of December. During October, the weather, though boisterous, from the unusual prevalence of high winds, was comparatively mild, with a mean temperature of 47°·1, and was chiefly characterized by the excessive fall of rain, apparently brought up by these stormy west and south-west winds. During November, again a severe storm of snow, preceded and followed by intense frost, occurred during its second week. The frequent frosts during the month had the effect of reducing its mean temperature to 37°·1, or nearly three degrees of temperature lower than the average. During December, again the balmy south-western breezes were the prevalent currents of air which played over Scotland, so that the month felt balmy and warm after the stormy November, and the mean temperature exceeded its average more than that of November fell below it. 41°·8 was the mean temperature of December; and, like October, the fall of rain was in excess of former years.

The mean barometric pressure, corrected to the sea level and to 32°, was 29·620 inches in October, 29·897 inches in November, and 29·767 in December. The mean temperature was 47°·1 in October, 37°·1 in November, and 41°·8 in December. The mean monthly range of temperature was 32°·8 in October, 33°·3 in November, and 22°·7 in December. The mean daily range of temperature was 12°·7 in October, 11°·0 in November, and 8°·7 in December. The absolute lowest temperature, as indicated by the black bulb thermometer, was 13° in October, 8° in November, and 15° in December. The mean dew-point temperature was 42°·8 in October, 33°·6 in November, and 38°·5 in December. The mean degree of humidity of the air was 88 in October, 90 in November, and 89 in December. Rain or snow fell on 19 days in October, 10 days in November, and 21 days in December—with a mean depth of 6·32 inches in October, 2·41 inches in November, and 5·20 inches in December. Winds with an easterly point blew 4 days in October, 7 days in November, and 4 days in December. Winds with a westerly point blew 21 days in October, 13 days in November, and 22 days in December.

SCOTLAND.—MARRIAGES, BIRTHS, and DEATHS Registered in the Quarter ended 31st December, 1862.

1	2	3	4	5	6
DIVISIONS. (Scotland.)	AREA in Statute	POPULATION, 1861. (Persons.)	Marriages.	Births.	Deaths.
	Acres.	No.	No.	No.	No.
SCOTLAND.....Totals	19,639,377	3,062,294	6,066	25,484	16,145
I. Northern	2,261,622	130,422	252	943	409
II. North-Western	4,739,876	167,329	209	1,179	662
III. North-Eastern	2,429,594	366,783	783	2,884	1,596
IV. East Midland	2,790,492	523,822	1,070	4,256	2,461
V. West Midland	2,693,176	242,507	410	1,809	1,131
VI. South-Western	1,462,397	1,008,253	2,064	9,214	6,283
VII. South-Eastern	1,192,524	408,962	879	3,582	2,620
VIII. Southern	2,069,696	214,216	399	1,617	983

No. III.—GREAT BRITAIN.

SUMMARY of MARRIAGES, in the Quarter ended 30th September; and BIRTHS, and DEATHS, in the Quarter ended 31st December, 1862.

COUNTRIES.	AREA in Statute	POPULATION, 1861. (Persons.)	Marriages.	Births.	Deaths.
	Acres.	No.	No.	No.	No.
England and Wales.....	37,324,883	20,066,224	40,585	171,811	114,542
Scotland	19,639,377	3,062,294	4,558	25,484	16,145
GREAT BRITAIN.....	56,964,260	23,128,518	45,143	197,295	130,687

Trade of United Kingdom, 1862-61-60.—Distribution of Exports from United Kingdom, according to the Declared Real Value of the Exports; and the Computed Real Value (Ex-duty) of Imports at Port of Entry, and therefore including Freight and Importer's Profit.

Merchandise (excluding Gold and Silver), Imported from, and Exported to, the following Foreign Countries, &c. (The unit 000's are omitted.)	First Nine Months.					
	1862.		1861.		1860.	
	Imports from	Exports to	Imports from	Exports to	Imports from	Exports to
I.—FOREIGN COUNTRIES:	£	£	£	£	£	£
Northern Europe; viz., Russia, Sweden, Norway, Denmark & Iceland, & Heligoland	12,402,	3,279,	10,299,	4,014,	13,505,	3,964,
Central Europe; viz., Prussia, Germany, the Hanse Towns, Holland, and Belgium	17,709,	16,072,	16,038,	16,015,	17,977,	12,206,
Western Europe; viz., France, Portugal (with Azores, Madeira, &c.), and Spain (with Gibraltar and Canaries)	19,259,	11,168,	18,039,	10,661,	16,563,	7,814,
Southern Europe; viz., Italy, Austrian Empire, Greece, Ionian Islands, and Malta	3,481,	5,481,	3,056,	6,037,	3,293,	4,696,
Levant; viz., Turkey, with Wallachia and Moldavia, Syria and Palestine, and Egypt	11,982,	4,834,	9,536,	4,371,	10,763,	5,927,
Northern Africa; viz., Tripoli, Tunis, Algeria, and Morocco	316,	143,	427,	124,	162,	154,
Western Africa	1,168,	718,	1,004,	615,	1,143,	695,
Eastern Africa; with African Ports on Red Sea, Aden, Arabia, Persia, Bourbon, and Kooria Moorla Islands	—	57,	6,	38,	40,	81,
Indian Seas, Siam, Sumatra, Java, Philippines; other Islands	813,	1,041,	847,	1,500,	869,	1,391,
South Sea Islands	—	—	—	93,	—	18,
China, including Hong Kong	8,865,	2,544,	6,913,	4,107,	6,803,	4,055,
United States of America	18,502,	10,468,	43,631,	6,803,	33,782,	16,235,
Mexico and Central America	754,	559,	477,	647,	451,	464,
Foreign West Indies and Hayti	3,709,	2,383,	3,670,	1,772,	2,836,	1,753,
South America (Northern), New Granada, Venezuela, and Ecuador	661,	743,	433,	1,105,	504,	926,
" (Pacific), Peru, Bolivia, Chili, and Patagonia	3,803,	1,220,	4,130,	1,929,	3,577,	2,242,
" (Atlantic) Brazil, Uruguay, and Buenos Ayres	4,278,	3,869,	3,248,	5,021,	3,134,	5,101,
Whale Fisheries; Grnld., Davis' Straits, Southn. Whale Fishery, & Falkland Islands	50,	10,	19,	6,	92,	4,
Total.—Foreign Countries	107,752,	64,589,	121,774,	64,858,	115,514,	71,726,
II.—BRITISH POSSESSIONS:						
British India, Ceylon, and Singapore	20,599,	12,690,	15,803,	13,587,	12,558,	14,897,
Austral. Cols.—New South Wales and Victoria	4,311,	5,920,	4,073,	5,819,	4,086,	5,945,
" " So. Aus., W. Aus., Tasm., and N. Zea.	1,818,	1,901,	1,741,	1,648,	1,645,	1,413,
British North America	5,208,	3,536,	5,497,	3,461,	4,124,	3,441,
" W. Indies with Btsh. Guiana & Honduras	5,391,	2,289,	4,832,	1,784,	5,060,	1,748,
Cape and Natal	937,	1,424,	818,	1,479,	1,174,	1,450,
Brit. W. Co. of Af., Ascension and St. Helena	142,	299,	120,	257,	112,	244,
Mauritius	902,	410,	1,814,	410,	1,272,	365,
Channel Islands	494,	614,	491,	492,	515,	495,
Total.—British Possessions	39,802,	29,083,	35,189,	28,937,	30,546,	29,998,
General Total	147,554,	93,672,	156,963,	93,795,	146,060,	101,724,

IMPORTS.—(United Kingdom.)—First Eleven Months (January—November), 1862-61-60-59-58.—Computed Real Value (Ex-duty), at Port of Entry (and therefore including Freight and Importer's Profit), of Articles of Foreign and Colonial Merchandise Imported into the United Kingdom.

(First Eleven Months.) (000's omitted.) FOREIGN ARTICLES IMPORTED.		1862.	1861.	1860.	1859.	1858.
		£	£	£	£	£
RAW MATLS.—Textile.	Cotton Wool	23,598,	35,940,	31,567,	28,762,	26,346,
	Wool (Sheep's) ..	10,492,	8,735,	9,727,	8,791,	7,717,
	Silk	14,243,	7,090,	7,881,	8,904,	5,488,
	Flax	4,694,	3,019,	3,377,	3,463,	2,703,
	Hemp	2,253,	1,637,	1,509,	2,205,	1,520,
	Indigo	2,360,	2,698,	2,403,	1,888,	2,167,
		57,640,	59,119,	56,464,	54,013,	45,946,
	“ Various. Hides	2,560,	2,377,	2,801,	2,795,	2,005,
	Oils	3,204,	2,987,	3,334,	2,846,	2,979,
	Metals	3,816,	3,164,	3,442,	3,221,	3,191,
“ “ Agricul.	Tallow	1,770,	2,272,	2,815,	2,547,	2,240,
	Timber.....	8,465,	9,228,	8,366,	7,002,	4,638,
		19,815,	20,028,	20,758,	18,411,	15,053,
	Guano	1,049,	1,781,	1,183,	720,	3,634,
	Seeds	2,553,	2,663,	2,697,	2,570,	2,005,
		3,602,	4,444,	3,880,	3,290,	5,639,
	TROPICAL, & C., PRODUCE. Tea ...	7,827,	5,895,	5,932,	4,510,	4,599,
	Coffee	3,057,	2,424,	2,175,	1,788,	1,505,
	Sugar & Molasses	11,276,	12,431,	11,722,	11,322,	11,868,
	Tobacco	1,790,	1,625,	984,	1,068,	1,522,
FOOD	Rice.....	2,069,	1,697,	778,	658,	1,475,
	Fruits	1,027,	1,155,	954,	950,	569,
	Wine	3,273,	3,563,	3,883,	2,320,	1,803,
	Spirits	1,470,	1,567,	1,769,	1,993,	1,059,
		31,789,	30,357,	28,197,	24,609,	24,400,
	Grain and Meal..	35,063,	31,568,	27,320,	16,558,	18,714,
	Provisions	6,858,	5,958,	5,036,	2,986,	2,880,
		41,921,	37,526,	32,356,	19,544,	21,594,
	Remainder of Enumerated Articles	3,499,	3,239,	3,232,	2,966,	2,586,
	TOTAL ENUMERATED IMPORTS.....	158,266,	154,713,	144,887,	122,833,	115,218,
Add for UNENUMERATED IMPORTS (say)		39,561,	38,678,	36,222,	30,708,	28,804,
TOTAL IMPORTS		197,827,	193,391,	181,109,	153,541,	144,022,

EXPORTS.—(United Kingdom.)—Whole Years, 1862-61-60-59-58.—Declared Real Value, at Port of Shipment, of Articles of BRITISH and IRISH Produce and Manufactures Exported from United Kingdom.

(Whole Year.) (Unit 000's omitted.) BRITISH PRODUCE, & C., EXPORTED.		1862.	1861.	1860.	1859.	1858.
		£	£	£	£	£
MANFRS.—Textile.	Cotton Manufactures..	30,569,	37,544,	42,138,	38,743,	33,402,
	“ Yarn.....	6,203,	9,293,	9,875,	9,466,	9,753,
	Woollen Manufactures	13,147,	11,141,	12,164,	12,033,	9,778,
	“ Yarn.....	3,854,	3,546,	3,844,	3,080,	2,954,
	Silk Manufactures ...	2,015,	2,036,	2,106,	2,145,	1,868,
	“ Yarn.....	346,	276,	295,	207,	229,
	Linen Manufactures....	5,131,	3,859,	4,802,	4,607,	4,124,
	“ Yarn.....	1,852,	1,616,	1,801,	1,685,	1,739,
		63,117,	69,311,	77,025,	71,966,	63,667,
	“ Sewed. Apparel	2,556,	2,154,	2,157,	2,191,	1,944,
METALS	Haberdy. and Milnry.	3,592,	3,423,	4,011,	4,289,	3,474,
		6,148,	5,577,	6,168,	6,480,	5,418,
	Hardware.....	3,346,	3,425,	3,772,	3,826,	3,280,
	Machinery	4,097,	4,220,	3,825,	3,701,	3,604,
	Iron	11,302,	10,342,	12,158,	12,327,	11,236,
	Copper and Brass.....	2,823,	2,313,	3,002,	2,600,	2,854,
	Lead and Tin	2,729,	1,822,	2,562,	2,552,	2,238,
	Coals and Culm	3,750,	3,593,	3,322,	3,266,	3,053,
		28,047,	25,715,	28,641,	28,272,	26,265,
	Ceramic Manufcts. Earthenware and Glass	1,863,	1,660,	2,094,	1,921,	1,721,
Indigenous Mfrs.	Beer and Ale	1,594,	1,417,	1,864,	2,116,	1,852,
	Butter	379,	484,	633,	717,	541,
	Cheese	127,	131,	119,	138,	91,
	Candles	226,	279,	239,	188,	157,
	Salt	321,	370,	358,	254,	288,
	Spirits	511,	484,	287,	306,	207,
	Soda.....	886,	604,	963,	1,024,	813,
		4,044,	3,769,	4,463,	4,743,	3,949,
	Various Manufcts. Books, Printed.....	416,	445,	495,	478,	390,
	Furniture	276,	264,	222,	242,	258,
Various Manufcts.	Leather Manufactures	2,565,	2,197,	2,129,	1,998,	2,011,
	Soap.....	227,	230,	250,	226,	210,
	Plate and Watches ...	505,	449,	564,	495,	454,
	Stationery.....	286,	649,	750,	840,	804,
		4,275,	4,234,	4,410,	4,279,	4,127,
	Remainder of Enumerated Articles	8,839,	4,556,	3,966,	3,366,	3,524,
	Unenumerated Articles	7,805,	10,293,	9,076,	9,413,	7,943,
		124,138,	125,115,	135,843,	130,440,	116,614,
	TOTAL EXPORTS					

SHIPPING.—FOREIGN TRADE.—(United Kingdom.)—Years, 1862-61-60-59.—
Vessels Entered and Cleared with Cargoes, including repeated Voyages, but
excluding Government Transports.

(Whole Year.)	1862.			1861.			1860.			1859.		
	Vessels.	Tonnage (000's omitted.)	Average Tonnage	Vessels.	Tonnage (000's omitted.)		Vessels.	Tonnage (000's omitted.)		Vessels.	Tonnage (000's omitted.)	
ENTERED:—												
Vessels belonging to—	No.	Tons.	Tons.	No.	Tons.		No.	Tons.		No.	Tons.	
Russia	436	135,	310	407	125,		435	126,		346	103,	
Sweden	963	162,	168	945	156,		1,119	182,		912	151,	
Norway	3,121	657,	210	2,917	634,		2,862	638,		2,564	578,	
Denmark	2,634	257,	98	2,321	226,		2,957	292,		2,771	277,	
Prussia and Ger. Sts.	3,857	929,	240	3,457	809,		4,067	836,		3,603	799,	
Holland and Belgium	1,778	247,	137	1,546	215,		1,758	239,		1,622	225,	
France	2,336	197,	84	1,686	136,		2,187	186,		2,334	192,	
Spain and Portugal	375	115,	308	436	106,		391	101,		399	94,	
Italy & other Eupn. Sts.	928	267,	287	863	239,		1,057	299,		699	197,	
United States	1,327	1,179,	888	1,932	1,647,		1,417	1,361,		1,115	1,078,	
All other States	15	5,	346	19	7,		20	6,		24	7,	
United Kingdm. & Depds.	17,770	4,150,	233	16,529	4,300,		18,270	4,293,		16,389	3,701,	
Totals Entered	22,356	6,590,	295	21,060	6,304,		20,104	5,762,		19,909	5,389,	
	40,126	10,740,	267	37,589	10,604,		38,374	10,055,		36,298	9,030,	
CLEARED:—												
Russia	417	127,	304	413	123,		396	117,		366	109,	
Sweden	981	163,	166	1,041	168,		1,163	185,		946	158,	
Norway	1,974	333,	168	1,903	312,		1,746	311,		1,782	343,	
Denmark	3,153	309,	98	3,285	323,		3,362	328,		3,161	313,	
Prussia and Ger. Sts.	5,480	1,072,	195	5,207	990,		5,033	936,		5,117	971,	
Holland and Belgium	2,195	331,	150	1,932	278,		2,018	319,		2,024	305,	
France	5,070	492,	97	5,135	496,		4,068	431,		3,612	394,	
Spain and Portugal	380	121,	318	398	107,		364	92,		377	93,	
Italy & other Eupn. Sts.	1,039	297,	286	1,098	304,		1,152	332,		837	233,	
United States	1,172	1,052,	897	1,580	1,369,		1,456	1,368,		1,158	1,091,	
All other States	32	12,	375	23	7,		19	6,		26	8,	
United Kingdm. & Depds.	21,893	4,309,	200	22,015	4,477,		20,777	4,425,		19,406	4,018,	
Totals Cleared	27,066	7,400,	269	26,454	6,841,		23,713	6,359,		23,701	6,224,	
	48,959	11,709,	240	48,469	11,318,		44,490	10,784,		43,107	10,242,	

GOLD AND SILVER BULLION AND SPECIE.—IMPORTED AND
EXPORTED.—(United Kingdom.)—Computed Real Value for the
Years 1862-61-60.

(000's at unit end omitted.)

(Whole Year.)	1862.		1861.		1860.	
	Gold.	Silver.	Gold.	Silver.	Gold.	Silver.
Imported from:—	£	£	£	£	£	£
Australia	6,705,	—	6,331,	1,	6,719,	1,
So. Amca. and W. Indies	1,631,	6,242,	1,600,	5,115,	1,180,	525,
United States and Cal.	9,732,	333,	39,	28,	3,918,	875,
	18,068,	6,575,	7,970,	5,144,	11,817,	5,401,
France	92,	2,203,	2,505,	690,	341,	3,698,
Hanse Towns, Holl. & Belg.	430,	2,707,	886,	524,	60,	966,
Prtgl., Spain, and Gbrltr.	25,	120,	27,	155,	14,	272,
Mlta., Trky., and Egypt	8,	13,	53,	29,	36,	19,
China	—	—	5,	1,	—	—
West Coast of Africa	100,	6,	78,	2,	91,	10,
All other Countries....	1,179,	128,	640,	38,	226,	27,
Totals Imported	9,902,	11,752,	12,164,	6,583,	12,585,	10,393,
Exported to:—						
France	6,356,	849,	998,	1,053,	10,401,	915,
Hanse Towns, Holl. & Belg.	348,	655,	21,	854,	151,	593,
Prtgl., Spain, and Gbrltr.	2,466,	8,	985,	3,	1,357,	1,
	9,170,	1,512,	2,004,	1,910,	11,909,	1,509,
Ind. and China (via Egypt)	1,920,	10,710,	794,	7,280,	1,302,	8,124,
Danish West Indies....	—	—	53,	39,	21,	29,
United States	37,	1,	7,298,	84,	1,724,	3,
South Africa	—	—	133,	10,	51,	—
Mauritius	—	—	—	2,	—	—
Brazil	409,	44,	20,	150,	357,	167,
All other Countries....	4,476,	1,047,	934,	98,	278,	61,
Totals Exported	16,012,	13,314,	11,238,	9,573,	15,642,	9,893,
Excess of Imports	3,890,	—	926,	—	—	500,
„ Exports	—	1,562,	—	2,990,	3,057	—

REVENUE.—(UNITED KINGDOM).—31ST DEC., 1862-61-60-59.

Net Produce in YEARS and QUARTERS ended 31ST DEC., 1862-61-60-59.

[Unit 000's omitted.]

QUARTERS, ended 31st Dec.	1862.	1861.	1862.		Corresponding Quarters.	
			Less.	More.	1860.	1859.
	£ Mlms.	£ Mlms.	£ Mlms.	£ Mlms.	£ Mlms.	£ Mlms.
Customs	6,320,	6,147,	—	173,	5,861,	6,225,
Excise	4,000,	3,896,	—	104,	4,359,	5,360,
Stamps	2,187,	2,098,	—	89,	2,036,	2,018,
Taxes	1,270,	1,282,	12,	—	1,293,	1,424,
Post Office	950,	910,	—	40,	880,	830,
	14,727,	14,333,	12,	406,	14,429,	15,857,
Property Tax	2,931,	2,359,	—	572,	3,530,	938,
	17,658,	16,692,	12,	978,	17,959,	16,795,
Crown Lands	86,	84,	—	2,	83,	83,
Miscellaneous	635,	292,	—	343,	228,	235,
Totals	18,379,	17,068,	12,	1,323,	18,270,	17,113,
			NET INCR. £1,310,889			

YEARS, ended 31st Dec.	1862.	1861.	1862.		Corresponding Years.	
			Less.	More.	1860.	1859.
	£ Mlms.	£ Mlms.	£ Mlms.	£ Mlms.	£ Mlms.	£ Mlms.
Customs	24,036,	23,774,	—	262,	23,032,	24,825,
Excise	17,534,	18,161,	627,	—	19,069,	19,041,
Stamps	8,914,	8,488,	—	426,	8,285,	7,977,
Taxes	3,148,	3,119,	—	29,	3,126,	3,231,
Post Office	3,600,	3,500,	—	100,	3,420,	3,225,
	57,232,	57,042,	627,	817,	56,932,	58,299,
Property Tax	11,104,	9,962,	—	1,142,	12,902,	6,077,
	68,336,	67,004,	627,	1,959,	69,834,	64,376,
Crown Lands	298,	294,	—	5,	290,	282,
Miscellaneous	2,362,	1,306,	—	1,055,	1,843,	1,413,
Totals	70,996,	68,604,	627,	3,019,	71,967,	66,071,
			NET INCR. £2,392,578			

REVENUE.—(UNITED KINGDOM).—QUARTER ENDED 31ST DEC., 1862:—
APPLICATION.

An Account showing the REVENUE and other RECEIPTS of the QUARTER ended 31st December, 1862; 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.

Received:—

Surplus Balance beyond the Charge of the Consolidated Fund for the Quarter ended 30th September, 1862, viz.:—	£
Great Britain	—
Ireland	£122,448
Income received in the Quarter ended 31st December, 1862, as shown on preceding page	122,448
Amount raised per Act 23 and 24 Victoria, cap. 109, on account of Fortifications, &c.	13,378,928
Amount received in the Quarter ended 31st December, 1862, in repayment of Advances for Public Works, &c.	250,000
	467,818
	£19,219,194
Balance, being the deficiency on 31st December, 1862, upon the charge of the Consolidated Fund in Great Britain, to meet the Dividends, and other charges, payable in the Quarter to 31st March, 1863, and for which Exchequer Bills (Deficiency) will be issued in that Quarter.	2,158,512
	£21,377,706

Paid:—

Amount applied out of the Income for the Quarter ended 31st December, 1862, in redemption of Exchequer Bills (Deficiency), for the Quarter ended 30th September, 1862	£
Amount applied out of the Income to Supply Services in the Quarter ended 31st December, 1862	3,429,902
Charge of the Consolidated Fund for the Quarter ended 31st December, 1862, viz.:—	9,209,769
Interest of the Permanent Debt	£6,299,670
Terminable Debt	349,866
Interest of Exchequer Bills	90,930
„ Deficiency Bills	1,625
The Civil List	101,139
Other Charges on Consolidated Fund	791,761
Advances for Public Works, &c.	178,551
	7,813,545
Surplus Balance in Ireland beyond the Charge of the Consolidated Fund in Ireland for the Quarter ended 31st December, 1862, viz.:	924,400
	£21,377,706

CORN.—Gazette Average Prices (ENGLAND AND WALES) Fourth Quarter of 1862.

[This Table is communicated by H. F. JADIS, ESQ., Comptroller of Corn Returns.]

Weeks ended on a Saturday 1862.		Weekly Average. (Per Impl. Quarter.)					
		Wheat.	Barley.	Oats.	Rye.	Beans.	Peas.
October 4	.....	s. d. 51 1	s. d. 35 5	s. d. 22 5	s. d. 31 8	s. d. 39 2	s. d. 41 1
" 11	.....	49 0	34 8	21 5	33 4	39 5	42 3
" 18	.....	48 1	31 5	21 7	34 8	39 1	42 5
" 25	.....	48 4	34 5	21 3	34 5	39 5	41 7
Average for October ..		49 5	34 8	21 8	34 3	39 3	41 10
November 1	.....	48 7	35 1	20 10	31 0	39 2	42 3
" 8	.....	49 2	35 9	21 1	34 9	40 -	41 4
" 15	.....	49 4	30 4	21 5	32 8	39 1	41 9
" 22	.....	48 9	35 10	21 6	32 5	39 3	43 3
" 29	.....	47 8	35 4	21 3	31 -	39 3	41 4
Average for November ..		48 8	35 8	21 3	32 5	39 4	42 5
December 6	.....	46 9	31 10	20 10	31 -	38 -	40 -
" 13	.....	46 10	31 9	20 7	41 3	37 10	39 5
" 20	.....	46 5	31 7	20 6	32 -	37 2	39 4
" 27	.....	45 7	31 1	20 4	33 1	36 4	37 11
Average for December ..		46 4	34 6	20 6	35 10	37 4	39 2
Average for the Quarter ..		48 2	35 -	21 2	33 9	38 8	41 0
Average for the Year		55 5	35 1	22 7	36 4	39 11	40 2

RAILWAYS.—PRICES, Oct.—Dec.,—and TRAFFIC, Jan.—Dec., 1862.

Total Capital Expended Mlns.	Railway.	For the (£100). Price on			Miles Open.		Total Traffic first 52 Weeks. (unit 000's omitted.)		Traffic pr. Mile pr. Wk. 52 Weeks.		Dividends per Cent. for Half Years.		
		1st Dec.	3rd Nov.	1st Oct.	'62.	'61.	'62.	'61.	'62.	'61.	30 Jun. '62.	31 Dec. '61.	30 Jun. '61.
					No.	No.	£	£	£	£	s. d.	s. d.	s. d.
£ 47.7	Lond. & N. Westn.	96½	92½	93½	1,179	1,003	4,578	4,452	74	85	37 6	47 6	37 6
41.3	Great Western	66	66½	66½	992	964	2,973	2,847	56	57	5 -	30 -	22 6
13.9	" Northern	125½	122½	124½	330	330	1,446	1,409	84	82	45 -	77 6	37 6
16.8	" Eastern	46½	46	46½	644	644	1,432	1,402	43	42	20 -	30 -	16 3
10.4	Brighton	119	124	123	247	241	1,000	933	78	74	50 -	70 -	50 -
14.6	South-Eastern	89½	86	83½	306	306	1,070	1,019	67	64	42 6	50 -	41 8
13.9	" Western	102½	99½	100	442	400	1,122	1,014	49	49	40 -	55 -	40 -
158.6		92	91	93½	4,140	3,888	13,621	13,076	63	65	34 3	51 -	35 1
22.0	Midland	128½	127½	129	630	614	2,064	2,063	63	65	55 -	70 -	62 6
19.5	Lancsh. and York.	109½	107½	109½	395	395	1,700	1,913	83	95	37 6	50 -	45 -
11.7	Sheffield and Man.	41	37½	38½	237	237	739	797	60	65	-	12 6	7 6
23.8	North-Eastern	99½	99½	97	894	867	2,050	2,110	44	47	42 6	50 -	52 6
77.0		94½	93	93½	2,156	2,113	6,553	6,883	58	63	45 -	45 6	41 9
9.1	Caledonian	115½	111½	109½	230	230	820	804	68	67	50 -	55 -	50 -
5.3	Gt. S. & Wn. Irind.	104½	106	106	329	329	422	427	25	25	50 -	50 -	50 -
250.0	Gen. aver.	95	94	95	6,855	6,560	21,416	21,190	60	62	36 6	49 9	39 3

Consols.—Money Prices 1st December, 93½,—3rd November, 93½,—1st October, 93½.
 Exchequer Bills. " 15s. pm. " 14s. to 19s. pm. " 16s. to 22s. pm.

BANK OF ENGLAND.—WEEKLY RETURN.

Pursuant to the Act 7th and 8th Victoria, c. 32 (1844), for Wednesday in each Week, during the FOURTH QUARTER (Oct.—Dec.) of 1862.

ISSUE DEPARTMENT.					COLLATERAL COLUMNS.	
1	2	3	4	5	6	7
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. £	1862.	Mlns. £	Mlns. £	Mlns. £	Mlns. £	1862. Per ann.
30,90	Oct. 1	11,02	3,63	16,25	21,53	24 July 2 p. ct.
30,37	" 8	11,02	3,63	15,72	21,37	
30,09	" 15	11,02	3,63	15,44	21,66	
29,72	" 22	11,02	3,63	15,07	21,46	30 Oct. 3 "
29,34	" 29	11,02	3,63	14,70	21,01	
29,21	Nov. 5	11,02	3,63	14,56	21,10	
29,17	" 12	11,02	3,63	14,52	20,99	
28,91	" 19	11,02	3,63	14,26	20,31	
28,73	" 26	11,02	3,63	14,08	19,88	
28,74	Dec. 3	11,02	3,63	14,09	19,75	
28,60	" 10	11,02	3,63	13,94	19,36	
28,71	" 17	11,02	3,63	14,06	19,19	
28,69	" 24	11,02	3,63	14,04	19,50	
28,77	" 31	11,02	3,63	14,12	19,87	

BANKING DEPARTMENT.

8	9	10	11	12	13	14	15	16	17	18
Liabilities.					Assets.					Totals of Liabilities and Assets.
Capital and Rest.	Deposits.		Seven Day and other Bills.		DATES.	Securities.		Reserve.		
Capital.	Rest.	Public.	Private.		(Wdnesdays.)	Government.	Other.	Notes.	Gold and Silver Coin.	
Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £	1862.	Mlns. £	Mlns. £	Mlns. £	Mlns. £	Mlns. £
14,55	3,64	8,49	13,59	,83	Oct. 1	11,25	19,79	9,37	,70	41,11
14,55	3,65	8,33	13,53	,77	" 8	11,25	19,75	9,00	,82	40,83
14,55	3,06	6,25	15,71	,74	" 15	12,16	18,93	8,43	,79	40,32
14,55	3,07	5,94	15,20	,80	" 22	11,86	18,61	8,26	,84	39,57
14,55	3,08	6,09	16,45	,72	" 29	11,76	19,98	8,33	,82	40,89
14,55	3,08	6,27	14,98	,78	Nov. 5	11,06	19,63	8,11	,86	39,67
14,55	3,09	6,93	14,74	,78	" 12	11,11	19,39	8,18	,87	40,09
14,55	3,09	7,39	14,00	,77	" 19	11,11	19,16	8,60	,91	39,78
14,55	3,11	7,39	14,38	,79	" 26	11,11	19,32	8,85	,94	40,22
14,55	3,07	8,19	13,65	,80	Dec. 3	11,03	19,33	8,99	,92	40,27
14,55	3,09	8,49	13,58	,76	" 10	11,08	19,27	9,24	,89	40,48
14,55	3,10	8,11	14,03	,75	" 17	11,08	19,36	9,52	,97	40,94
14,55	3,11	8,65	14,31	,65	" 24	11,13	20,12	9,19	,83	41,27
14,55	3,12	8,34	15,47	,64	" 31	11,24	21,15	8,90	,84	42,13

CIRCULATION.—COUNTRY BANKS.

Average amount of Promissory Notes in Circulation in ENGLAND and WALES, on Saturday, in each Week during the FOURTH QUARTER (Oct.—Dec.) of 1862; and in SCOTLAND and IRELAND, at the Three Dates, as under.

ENGLAND AND WALES.				SCOTLAND.				IRELAND.		
DATES.	Private Banks. (Fixed Issues, 433.)	Joint Stock Banks. (Fixed Issues, 330.)	TOTAL. (Fixed Issues, 763.)	Four Weeks, ended	£5 and upwards.	Under £5.	TOTAL. (Fixed Issues, 275.)	£5 and upwards.	Under £5.	TOTAL. (Fixed Issues, 635.)
1862.	Mins. £	Mins. £	Mins. £	1862.	Mins. £	Mins. £	Mins. £	Mins. £	Mins. £	Mins. £
Sept. 27	3,23	2,90	6,13							
Oct. 4	3,37	3,02	6,39							
" 11	3,47	3,04	6,51							
" 18	3,48	3,01	6,49	Oct. 18	1,59	2,60	4,19	2,91	2,65	5,56
" 25	3,45	2,98	6,43							
Nov. 1	3,41	2,98	6,39							
" 8	3,37	2,97	6,34							
" 15	3,31	2,95	6,26	Nov. 15	1,67	2,74	4,41	3,01	2,91	5,92
" 22	3,27	2,94	6,21							
" 29	3,24	2,90	6,14							
Dec. 6	3,17	2,85	6,02							
" 13	3,13	2,80	5,93	Dec. 13	1,69	2,88	4,57	2,89	2,95	5,84

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
DATES.	Paris.				Hamburg.			New York.	Calcutta.		Hong Kong.	Syd- ney.	Stand- ard Silver in bar in Lon- don.
	London on Paris.	Bullion as arbitrated.		Prem. or Dis. on Gold per mille.	London on Hambg.	Bullion as arbitrated.			India House.	At Calcutta on London.			
		Agnst. Engd.	For Engd.			Agnst. Engd.	For Engd.						
3 m. d.	Agnst. Engd.	For Engd.	per mille.	3 m. d.	Agnst. Engd.	For Engd.	60 d. s.	60 d. s.	6 m. s.	6 m. s.	30 d. s.	pr. ct.	
1862.		pr. ct.	pr. ct.			pr. ct.	pr. ct.	pr. ct.	d.	d.	d.	pr. ct.	d.
Oct. 4 ..	25.45	—	0.1	par	13.8	—	0.2	129	23 ³ / ₄	24 ¹ / ₂	55	1 ¹ / ₂ p.	61 ¹ / ₂
„ 18 ..	.45	—	0.1	„	.8	—	0.1	136	„	24 ¹ / ₈	„	„	61 ¹ / ₂
Nov. 1 ..	.45	—	—	¹ / ₂ p.	.7 ¹ / ₂	—	0.1	147	„	24 ³ / ₄	„	„	61 ¹ / ₂
„ 15 ..	.42 ¹ / ₂	0.1	—	1 ¹ / ₂ „	.6 ³ / ₄	—	0.1	145	„	„	„	„	62 ¹ / ₂
Dec. 6 ..	.42 ¹ / ₂	0.2	—	1 „	.6 ³ / ₄	—	0.3	146	„	25	„	„	61 ¹ / ₂
„ 20 ..	.50	—	0.1	¹ / ₂ „	.6 ³ / ₄	—	0.2	146	„	24 ¹ / ₈	„	„	61 ¹ / ₂

JOURNAL OF THE STATISTICAL SOCIETY,

JUNE, 1863.

REPORT of the COUNCIL for the FINANCIAL YEAR ended 31st December, 1862, and for the SESSIONAL YEAR ended March, 1863, presented at the TWENTY-NINTH Anniversary Meeting of the STATISTICAL SOCIETY, held at the Society's Rooms, 12, St. James's Square, on Saturday, 14th March, 1863; with the PROCEEDINGS of that Meeting.

RIGHT HON. SIR JOHN S. PAKINGTON, BART., M.P., G.C.B.,
President, in the Chair.

THE Council have to report that the number of Fellows now on the list (March, 1863) is 365, including 67 Life Members—against 374 (including 70 Life Members) at the same date last year. The losses by death, withdrawal, and default, have been 35; the new elections are 26. In 1861-2, the losses were 23; and the new elections 24.

The Income of the Year ended 31st December, 1862 (exclusive of the Balance of 226*l.* from 1861), was 770*l.* (against 734*l.* in 1861); and the expenditure was 763*l.* (against 744*l.* in 1861), leaving a Cash Balance, on 31st December, 1862, of 233*l.* (against 226*l.* at end of 1861).

The Surplus of Assets, on 31st December, 1862, was 1,720*l.*, after providing for all Liabilities; on 31st December, 1861, it was 1,677*l.* Hence the financial condition of the Society has been satisfactorily maintained during the past year, in spite of a slight, and doubtless only temporary, falling off in the number of its Members.

The Papers read at the Monthly Meetings have maintained the reputation of the Society. They have combined scientific accuracy with practical utility, and have given rise to discussions of a highly interesting and suggestive character.

The following is a List of the Papers which have been read from March, 1862, to March, 1863:—

March, 1862.—*Dr. Mouat*.—On Prison Statistics and Discipline in Lower Bengal.