did justice to the superior persevering energy of the English workman, whose enduring, untiring, savage industry, surpasses that of every other manufacturing country I have visited, Belgium, Germany, and Switzerland not excepted."

The noxious agencies not only impair the strength of the labouring community, but, as will be further shown, they tend also to shorten the period of its exercise. This effect will be more apparent when considering merely the pecuniary burdens of the excess of orphanage and premature widowhood, apart from the loss of protection and the misery which it causes. I shall here only observe, as to the depressing effects assumed from the admitted tendencies of an increase of population, that the fact is, that hitherto, in England, wages, or the means of obtaining the necessaries of life for the whole mass of the labouring community, have advanced, and the comforts within the reach of the labouring classes have increased with the late increase of population. This may be verified by reference to various evidence, and amongst others to that contained in Sir F. Eden's examinations of the wages and modes of subsistence of the agricultural labourers in his day, and we have evidence of this advance even in many of the manufacturing districts now in a state of severe depression. For example, an eminent manufacturer in Lancashire, stated to me in November ultimo—"That the same yarn which cost my father 12*d.* per lb. to make in 1792, all by machinery, now costs only 2*d.* per lb.; paying *then* only 4*s.* 4*d.* per hand wages weekly, *now* 8*s.* 8*d.* or more; yet those wages amounted *then* to 5½*d.* per lb., and notwithstanding the higher wages, *now*, to only 1*d.* per lb."

The prices of provisions were, during the first period, as high as now, and the cost of clothing 30 or 40 per cent. higher.

V.—Pecuniary burdens created by the neglect of sanitary measures.

The more closely the subject of the evils affecting the sanitary condition of the labouring population is investigated the more widely do their effects appear to be ramified. The pecuniary cost of noxious agencies is measured by data within the province of the actuary, by the charges attendant on the reduced duration of life, and the reduction of the periods of working ability or production by sickness; the cost would include also much of the public charge of attendant vice and crime which come within the province of the police, as well as the destitution which comes within the province of the administrators of relief. Of the pecuniary effects, including the cost of maintenance during the preventible sickness, any estimate approximating to exactness could only

be obtained by very great labour, which does not appear to be necessary.

To whatever extent the probable duration of the life of the working man is diminished by noxious agencies, I repeat a truism in stating that to some extent so much productive power is lost; and in the case of destitute widowhood and orphanage, burdens are created and cast either on the industrious survivors belonging to the family, or on the contributors to the poor's rates during the whole of the period of the failure of such ability. With the view to judge of the extent to which such burdens are at present cast upon the poor's rates, I have endeavoured to ascertain the average age at which death befell the heads of those families of children who with the mothers have been relieved on the ground of destitution, in eight of the unions where the average age of the mortality prevalent amongst the several classes of the community has been ascertained.

The workmen who belong to sick-clubs and benefit-societies generally fix the period of their own superannuation allowances at from 60 to 65 years of age. I see no reason to doubt that by the removal of noxious agencies not essential to their trades; by sanitary measures affecting their dwellings, combined with improvements in their own habits, the period of ability for productive labour might be extended to the whole of the labouring class.

The actual duration of the ability for labour will vary with the nature of the work, though there can be little doubt that the variations under proper precautions would be much less than those which now take place. From the information received in respect to the employment of tailors in large numbers, it is evident that the average period of the working ability of that class might be extended at least ten years by improvements as to the places of work alone. The experience which might serve to indicate the extent of practicable improvement is at present narrow and scattered. The chief English insurance tables, such as the Northampton and Carlisle tables, are made up apparently from the experience of a population, subject probably to a greater or less extent to the noxious influences which are shown to be removable. By the Carlisle table, however, the probability of life to every person who has attained the age of twenty-one—the age for marriage—would be 40 years, or 40·75. By the Swedish tables, which are frequently applied to the insurance of the labouring classes, it would be 38·0. The observations that have been made on the subject, show that marriage improves rather than diminishes the probabilty of life. Where the duration of life is reduced by the nature of the employment below the usual average, by so much the widowhood may be considered as increased, as also the orphanage of their children. As labouring men generally marry early in life, their wives have ceased to bear children before they

have reached fifty, so that the great mass of orphanage may be assigned to the consequence of premature death. The following table shows the average ages at which the deaths occurred of the fathers of the widows' orphan children who are in receipt of relief in the following unions. The average includes the cases of all who died at whatever ages, whether above or below sixty:—

Unions.	Number of Husbands dying under 60.	Average Age at Death.	Number of Husbands dying above 60.	Average Age at Death.	Total Deaths.	Average Age.
Manchester . .	718	42	432	69	1150	52
Whitechapel .	351	44	239	69	590	54
Bethnal Green .	250	44	195	69	445	55
Strand . . .	157	42	63	66	220	49
Oakham & Uppingham . .	136	45	118	71	257	57
Alston-with-Garrigill . .	69	45	20	66	89	50
Bath . . .	66	38	1	60	67	39

This premature widowhood and orphanage is the source of the most painful descriptions of pauperism—the most difficult to deal with; it is the source of a constant influx of the independent into the pauperised and permanently dependent classes. The widow, where there are children, generally remains a permanent charge; re-marriages amongst those who have children are very rare; in some unions they do not exceed one case in twenty or thirty. By the time the children are fit for labour and cease to require the parents' attention, the mothers frequently become unfit for earning their own livelihood, or habituated to dependence, and without care to emerge from it. Even where the children are by good training and education fitted for productive industry, when they marry, the early familiarity with the parochial relief makes them improvident, and they fall back upon the poor's rates on the lying-in of their wives, on their sickness, and for aid on every emergency. In every district the poor's rolls form the pedigrees of generations of families thus pauperized. The total number of orphan children on account of whose destitution relief was given from the poor's rates in the year ended Lady-day, 1840, was 112,000.

The numbers of widows chargeable to the poor's rates was in those unions at that period 43,000. The following abstract of the returns from the eight unions selected exhibit the proportions who become chargeable at different periods of the head of the family.

Ages.	Manchester Union.		Whitechapel Union.		Bethnal Green.		Strand Union		Oakham & Uppingham Unions.		Alston with Garrigill.		Bath Union.		Total.	
	No. of Husbands who Died	No. of Orphan Children.	No of Husbands who Died.	No. of Orphan Children.	No. of Husbands who Died.	No. of Orphan Children.	No. of Husbands who Died.	No. of Orphan Children.	No. of Husbands who Died.	No. of Orphan Children.	No. of Husbands who Died.	No. of Orphan Children.	No. of Husbands who Died.	No. of Orphan Children.	No of Husbands who Died.	No. of Orphan Children.
20—25	11	20	7	12	2	3	1	4	..	..	1	2	..	..	22	41
25—30	56	126	17	40	9	19	11	19	12	25	5	12	9	28	119	269
30—35	108	317	31	85	25	89	23	70	8	36	4	16	13	52	212	665
35—40	108	333	42	114	40	137	20	69	19	71	6	24	12	52	247	800
40—45	126	361	63	201	40	153	35	81	24	68	12	58	18	84	318	1006
45—50	112	302	61	178	44	105	23	58	19	50	18	84	9	37	286	814
50—55	100	183	78	137	45	107	24	34	30	60	9	30	4	15	290	566
55—60	97	138	51	37	45	54	20	17	24	36	14	11	1	6	252	299
60—65	147	148	87	46	53	35	25	17	26	15	13	4	1	4	352	269
65—70	96	60	48	18	52	17	15	13	26	13	1	..	..	..	238	121
70—75	87	55	54	8	57	7	13	..	32	10	4	..	..	..	247	80
75—80	60	22	25	4	24	8	5	2	22	4	1	..	..	..	137	40
80—85	35	4	17	2	7	..	5	..	11	6	1	..	..	..	76	12
85—90	5	..	7	3	2	..	..	..	..	..	..	..	..	..	14	3
90—95	1	..	2	..	..	..	..	..	1	..	..	..	..	..	4	..
95—100	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
100—105	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
Totals .	1150	2069	590	885	445	734	220	384	254	394	89	241	67	278	2815	4985
No. receiving Relief previous to husband's death	199	..	80	..	..	..	37	..	11	..	27	..	..	..	..	..

Total Deaths below 60 years of age 1746

Of the whole number it appears that upwards of 1764 became chargeable by premature deaths. If the same rule obtains in the other unions, which could only be ascertained by a very long and expensive inquiry, then nearly 27,000 cases of premature widowhood, and more than 100,000 cases of orphanage may be ascribed to removable causes. The chief effects or the chief of the diseases which appear as consequents to the circumstances under which the labouring population of the several districts have been described as living, and under which the fathers of the orphan children above enumerated have died, are set forth in the following table:—

TABLE of the Chief Causes of Death producing Widowhood and Orphanage in the undermentioned Unions and Parishes.

DISEASES, &c.	Manchester Union.	Whitechapel Union.	Bethnal Green Parish.	Strand Union.	Oakham and Uppingham Unions.	Alston-with-Garrigill Parish.	Bath Union.	Total.		
	No. of Deaths.	No. of Deaths.	No. of Deaths.	No. of Deaths	No. of Deaths.	No. of Deaths.	No. of Deaths.	No. of Deaths.	Average Age of Decease	No. of Orphans.
Respiratory Organs,	500	212	147	95	69	47	40	1110	51	2218
Epidemic, Endemic and Contagious	146	65	73	28	34	9	4	359	46	862
Digestive Organs.	60	16	10	10	14	5	3	118	54	180
Nervous . . .	74	41	38	17	25	3	5	203	55	296
Violent Deaths .	94	44	20	16	23	13	5	215	46	508
Old Age . . .	84	104	46	13	47	5	..	299	74	56
Other Diseases* .	129	68	104	32	36	7	8	384	54	694
Undescribed . .	63	40	7	9	6	..	2	127	47	171
Total . .	1150	590	445	220	254	89	67	2815	53	4985

* The diseases included under "Other Diseases," include the deaths registered from a number of miscellaneous causes too numerous to be specified in the table.

As an example of the mode in which the causes of premature deaths fall, and of the burdens they entail in many districts, I submit a return of the whole of the cases of widowhood on the pauper rolls of the parish of Alston and Garrigill, Cumberland, the parish in which are situate the lodging-houses described in the evidence collected by *Dr. Mitchell.*

ALSTON WITH GARRIGILL PARISH.

Number of Widows, and Children dependent upon them, in receipt of Relief in the above Parish; Age of Husband at Death; and the alleged Cause of Death.

Initials of Widows.	Number of Children dependent at the time of Husband's Death.	Occupation of deceased Husband.	Age at Death.	Years' loss by premature Death.	Assigned Cause of Death.
R. W. .	..	Miner .	83	..	Decay of nature.
M. S. .	..	Tailor .	78	..	Natural decay.
M. B. .	..	Miner .	73	..	Not stated.
M R. .	..	Miner .	72	..	Decay of nature.
S. M. .	..	Miner .	72	..	Decay of nature.
M. T. .	..	Mason .	72	..	Asthma produced from age.
A. V. .	..	Miner .	67	..	Asthma produced from working in mines.
M. L. .	..	Miner .	64	..	Influenza.
A. M. .	..	Miner .	63	..	Asthma produced from working in the lead-mines.
M. S. .	..	Miner .	63	..	Natural decline.
J. P. .	..	Labourer	62	..	Consumption.
H. T. .	2	Mason .	62	..	Asthma.
S. H. .	2	Miner .	60	..	Rupture of blood-vessel.
J. R. .	..	Miner .	60	..	Asthma produced from working in the mines.
H. L. .	..	Miner .	60	..	Asthma.
J. P. .	..	Miner .	60	..	Consumption.
M. T. .	2	Miner .	60	..	Bursting blood-vessel.
A. C. .	..	Joiner .	60	..	Jaundice.
E. K. .	..	Miner .	60	..	Asthma produced from working in the mines,
E. H. .	..	Miner .	60	..	Cholera.
D. J. .	..	Glazier .	59	1	Affection of the liver.
N. D. .	4	Butcher .	59	1	Apoplexy.
M. T. .	..	Miner .	59	1	Inflammation of the lungs.
H. A. .	..	Miner .	59	1	Asthma produced from working in the lead-mines, which terminated in consumption.
J. B. .	..	Miner .	59	1	Asthma ditto.
E. T. .	..	Labourer	58	2	Accident by a coal-waggon.
M. P. .	..	Miner .	58	2	Asthma produced from working in the lead-mines, which terminated in consumption.
H. T. .	..	Miner .	57	3	Consumption accelerated by working in the lead-mines.
M. P. .	1	Turner .	57	3	Consumption.
H. S. .	3	Miner .	57	3	Influenza, terminating in dropsy.
M. J. .	3	Blacksmith	55	5	Asthma.
S. M. .	..	Miner .	55	5	Inflammation of lungs from cold.
R. W. .	..	Miner .	55	5	Asthma produced from working in lead-mines.
M. R. .	..	Miner .	55	5	Asthma from working in the mines
J. W. .	2	Miner .	54	6	Pleurisy.
A. F. .	..	Miner .	54	6	Asthma and rupture of blood-vessel.

Number of Widows, and Children dependent upon them, &c.—*continued.*

Initials of Widows.	Number of Children dependent at the time of Husband's Death.	Occupation of deceased Husband.	Age at Death.	Years' loss by premature Death.	Alleged Cause of Death.
J. L. .	2	Miner .	53	7	Chronic disease of rheumatism.
N. H. .	2	Miner .	53	7	Asthma produced from working in the lead-mines.
A. S. .	..	Miner .	52	8	Asthma and bursting blood-vessel.
M. W. .	6	Miner .	52	8	Asthma produced from working in the mines.
E. W. .	5	Miner .	52	8	Asthma produced from working in the mines, which terminated in consumption.
J. S. .	6	Miner .	51	9	Paralysis.
H. P. .	9	Quarry-man.	49	11	Asthma by working in the lead-mines.
H. P. .	5	Miner .	48	12	Typhus fever.
E. H. .	6	Miner .	48	12	Killed in lead-mines.
M. A. .	7	Miner .	48	12	Consumption by bad air in the pit.
J. C. .	8	Miner .	47	13	Asthma produced by working in the lead-mines.
S. E. .	6	Miner .	47	13	Consumption produced from a continuance of influenza.
M. T. .	8	Miner .	47	13	Consumption and asthma.
E. B. .	3	Miner .	47	13	Affection of the head, caused from an accident received in the mine.
D. R. .	..	Miner .	46	14	Asthma produced from working in the lead-mines.
E. B. .	5	Miner .	46	14	Rheumatic fever, which produced inflammation of the brain.
M. S. .	5	Miner .	46	14	Killed in lead-mine.
M. R. .	1	Joiner .	46	14	Dropsy.
M. F. .	7	Coal Miner.	46	14	Explosion of fire-damp in a coal-mine.
L. T. .	3	Miner .	45	15	Asthma, which terminated with dropsy.
H. P. .	3	Miner .	45	15	Scarlet fever.
H. Y. .	5	Miner .	45	15	Consumption, accelerated by working in the lead-mines.
M. S. .	2	Miner .	45	15	Inflammation of bowels.
M. S. .	5	Joiner .	45	15	Consumption.
A. S. .	6	Miner .	44	16	Dropsy.
A. B. .	6	Miner .	44	16	Asthma from working in lead-mines.
F. C. .	5	Miner .	43	17	Asthma produced from working in the lead-mines.
M. D. .	4	Miner .	43	17	Consumption produced from asthma, caused by working in the mines.
H. M. .	7	Miner .	43	17	Asthma, which terminated in consumption.
A. P. .	7	Superintendent.	43	17	A fall from the "horse" in the engine-shaft.

Number of Widows, and Children dependent upon them, &c.—*continued.*

Initials of Widows.	Number of Children dependent at the time of Husband's Death.	Occupation of deceased Husband.	Age at Death.	Years' loss by premature Death.	Alleged Cause of Death.
P. W. .	4	Miner .	43	17	Pleurisy.
E. W. .	8	Miner .	42	18	Consumption and asthma produced from working in the lead-mines.
J. H. .	4	Minar .	42	18	Consumption.
J. J. .	5	Miner .	42	18	Pleurisy.
A. J. .	2	Miller .	42	18	Found drowned.
M. R. .	..	Shoemaker	40	20	Injury from fall of a cart.
E. R. .	7	Joiner .	38	22	Affection of the liver.
J. B. .	5	Miner .	38	22	Consumption.
A. P. .	7	Miner .	37	21	Asthma.
E. W. .	3	Miner .	36	24	Accident in mine, which terminated in consumption.
E. H. .	3	Miner .	35	25	Killed in coal-pit.
M. L. .	2	Miner .	35	25	Water of the head.
A. S. .	4	Miner .	35	25	Income on leg.
S. H. .	7	Miner .	34	26	Accident in coal-mine.
J. H. .	4	Cordwainer	30	30	Typhus fever.
S. H. .	3	Cartman	30	30	Accidental.
E. A. .	2	Miner .	30	30	Consumption.
M. J. .	3	Teacher .	29	31	Consumption.
M. R. .	3	Miner .	29	31	Affection of urinary organs.
A. W. .	2	Miner .	28	32	Cholera.
M. W. .	3	Miner .	27	33	Inflammation of bowels.
A. H. .	1	Pitman .	25	35	Accident at colliery.
J. M. .	2	Miner .	21	39	Small-pox.
89	242	..	4418	..	
		Average age at death of each below 60 years of age.	45		Total No. of orphans by deaths caused below 60 years of age. 236

A complete analysis of the whole of the causes contributory to the premature mortality displayed in this group of cases would be a work of much labour, and would in nowise affect the soundness of the conclusions derivable from other sources, that a large amount, and probably the great mass of it, is preventible.

It would, for instance, be difficult to decide the precise term of years of life cut short by the effects of the lodging-houses, in producing or aggravating other tendencies to consumption; but the information possessed by persons who have made themselves acquainted with the effects of impure air enables them to pronounce with certainty that the habitual exposure of a body of men to such noxious influences must be attended by a diminution of several years of the definite standard of life. Of the 31 deaths of

miners below 60 years of age, from diseases of the respiratory organs, enumerated in the above return, a part of the causes may be attributable to their occupation, a part to the external circumstances of residence and connected habits. Now we have examples of the separate advantages attendant on the removal of both causes of disease I adduce the following information, obtained through Sir John Walsham, with relation to the effects of an improvement in the external circumstances of the workmen as to residences.

Captain Harland, the chairman of the Reeth union, York (North Riding), in a communication to Sir John Walsham, states, that he has been anxious to ascertain as correctly as possible, first, the average duration of life among the mining population of the respective parishes in that district, and how far it appeared to be affected by their general habits as well as by the state of their domiciles; and he gives the following results:—

"By a careful examination of the parish registers, I find that in the last seven years there have died in—

The parish of Marrick . .	15 miners;	average age,	$47\frac{3}{5}$ years.
The parish of Arkendale . .	70 ,,	,,	$45\frac{12}{13}$,,
The chapelry of Muker, in the parish of Grinton . . .	39 ,,	,,	$45\frac{23}{39}$,,
The remainder of the parish of Grinton, *viz.* Grinton Reeth and Meblecks	40 ,,	,,	$54\frac{32}{40}$,,

Total, 164; general average, $48\frac{13}{164}$ years.

"The prevailing diseases throughout the whole district are bronchial affections and rheumatism, which may generally be attributed to exposure to cold and rain after leaving the close, warm atmosphere of the mine.

"The miners' dwellings in Marrick are small thatched cottages, situated very near their work; they are consequently less exposed to wet and cold on their way home, but (although dry and kept tolerably clean) from the want of room and proper ventilation, the inmates are more liable to contagious disorders than the more comfortably lodged miners in the parish of Grinton. In Arkendale the houses are of a somewhat better description, but the drainage is imperfect; the habits of the people filthy and intemperate; cutaneous disorders very common; and they are frequently the victims of typhus and other malignant fevers.

"In the parish of Grinton the houses are of a decidedly superior description. Forty years ago they were mostly thatched with ling or heath; a thatched house is now rarely seen. The miners are all comfortably lodged, generally well clothed, clean, and orderly in their habits; and I have no doubt to these causes may be attributed the great difference between the mortality in this parish and that of Arkendale in the same period.

"In Muker the mortality, in proportion to its population, has been nearly the same as in Arkendale; but many of the miners work occasionally in coal-mines, are more exposed to storms, by reason of their work being at a greater distance from their dwellings; and those dwellings are also of a description inferior to those of the other townships in the parish of Grinton. From these circumstances I infer that the average duration of a lead-miner's life, and his greater freedom from disease, have increased in proportion to the increased airiness and increased convenience of his dwelling."

I have already referred to the example cited by Dr. Barham of the health of the miners in one mine, the Dolcoath mine, in the parish of Camborne, in Cornwall, where great attention is paid to obviate agencies injurious to the miners. Care is there taken in respect to ventilation in the mines. "The ventilation in Dolcoath is particularly good, and the men are healthier than in most other mines; there are more old miners." Care is taken for the prevention of accidents. "Our ladders," says one of the witnesses examined by Dr. Barham, "are about two fathoms and a half in length, generally with staves one foot apart. We use oak staves; old ship oak we find the best. We formerly used the hafts of the picks and other tools, but found these unsafe, the wood being sleepy and flawed, and sometimes breaking off in a moment, without having shown any outward sign of unsoundness. Iron staves, besides being at times very slippery, are apt to be corroded, so as to cut the hand. We have had no accidents on our footways for a long time." They have introduced the safety fuse, and the witness says:—"Very few accidents now arise from explosions;" "they used to happen frequently formerly." Care is taken of the miners on quitting the mines; hence, instead of issuing on the bleak hill side, and receiving beer in a shed, to prevent chill and exhaustion, they issue from their underground labour into a warm room, where well-dried clothes are ready for them, and warm water, and even baths are supplied from the steam furnace, and, in the instance of this mine, a provision of hot beef-soup instead of beer is ready for them in another room. The honour of having made this change is stated to be due to the Right Hon. Lady Basset, on the suggestion of Dr. Carlyon. "Hence in this mine," says Dr. Barham, "we may fairly attribute to the combination of beneficial arrangements just noticed that in Dolcoath, where 451 individuals are employed underground, only two have died within the last three years of miners' consumption, a statement which could not, I believe, be made with truth nor be nearly approached in respect of an equal number of miners during the same term in any other Cornish district." The sick-club of the mine "is comparatively rich, having a fund of 1500*l*."

When "care" is mentioned as taken for sanitary measures, it is to be remembered that it is care only at the outset, and that when in habitual action the care required is really less, and the measures should be characterized as means for avoiding care and trouble and diminishing pecuniary loss.

The effect of sanitary care in the mines of Camborne is, so far as it has been carried, marked in the following table, made up by Mr. Blee, a medical practitioner in the neighbourhood, from the mortuary registers, showing the average age of death of the

population as compared with the average of death in two other adjacent parishes of Illogan and Gwennap, in both of which some beneficent alterations have been made, especially in Illogan, but the works are stated to be new, and the circumstances not so favourable as at Camborne:—

TABLE showing the average Ages of Persons dying above 30, and registered, in three years in the Parish of Camborne, in two years in Gwennap, and in one year in Illogan.

	Males.		Females.	Proportion per cent. of Miners' Deaths by Mine Accidents.
	Miners.	Not Miners.		
Gwennap .	45	60	64	16
Illogan . .	49	68	64	32
Camborne .	54	60	63	5

The improvement in Camborne had not reached the residences, where the miners kept pigs, in sties close behind the house, and a dungheap is carefully fostered in a catch-pit adjacent. Dr. Barham, and the medical men practising in the vicinity, attribute to the decomposition of vegetable matter in the "soaked soil from the receptacles near the dwellings a form of fever which has been hanging about Camborne, and has often passed into the typhoid condition, and has been attended with great prostration of strength."*

I have obtained through Mr. Baker, of Leeds, who, as superintendent of factories, has had good means of making an accurate comparison, the following contrast of the results as shown in the state of mortality amidst the population of two contiguous manufacturing districts employed in similar proportions in the same description of work, and differing only in the state of the atmo-

* Where so much independent provision is made, as by clubs, only a part of the consequences of premature deaths appear on the poor's roll. The population of Camborne is less exclusively mining than is Gwennap; but the records of pauperism in the office afford marks of a general difference in the condition of the population of the two parishes.

Parish.	Ratio of Paupers to the whole Population.	Ratio of Widows and Women whose Husbands have deserted them, or are transported, to the whole Population.	Cost of Relief per Head on the whole Population.
			s. *d.*
Gwennap	1 in 25	1 in 186	3 2
Illogan	1 in 35	1 in 346	2 2¾
Camborne	1 in 34	1 in 401	2 4¾

sphere in which they lived. The districts are the townships of Great Bradford and Horton, in Yorkshire, both in the parish of Bradford, and contiguous, differing only in elevation and atmospheric influence.

"The town of Bradford lies in a hollow formed by the high land of the surrounding country, a part of which forms the township of Horton, and both populations, in about an equal ratio, are employed in worsted-mills, built about the same period of time, in the same kind of architecture, with the same appliances for ventilation and purification in every respect, differing only in comparison as to numbers both of population and mills.

	Population.	Births.	Deaths.
Bradford . .	34,560	1 in 25·8	1 in 37·3
Horton . .	17,618	1 in 28·0	1 in 47·0

The difference between the two localities will at once be seen, and can only be accounted for by the difference in atmospheric influences, the former population being resident in ill-conditioned dwellings, without sufficient ventilation; the latter residing in localities which, though undrained in many instances, are yet open to pure air and breezes which never reach the town without the most perfect contamination."

Dr. Barham mentions, as an example of the benevolent foresight which economizes the strength and life of workmen, and perceives that there is a profit as well as humanity in so doing, that at Tresavean, a great copper mine in Gwennap, as a substitute for the ladders, before universal, machinery has been erected for the raising and lowering of the miners. This, he states, will be effected at the cost of 2000*l.* at the least, but this sum, it is calculated, will soon be repaid by the saving of the time and fatigue of the men.

Such evidence as that above given, and as will be submitted in other instances, will leave little doubt that, by a combination of practicable sanitary regulations comprehending the economy of the residence as well as the place of work, the enormous suffering and waste of life which at present depresses large masses of the working population may be rendered comparatively inconsiderable. The amount of such depression on the mining population, in making it consist of young persons and more transient, is marked in a return prepared by Mr. R. Lanyon, the medical practitioner acquainted with the locality, and which was read at the Polytechnic Society in Cornwall.

On examining the ages of 2145 *men* engaged in mining, it was found that their average age was 30 years, and that the average period they had been engaged in work was 15 years. On examining the condition of 1033 *men*, artisans, agricultural labourers, living and working in the vicinity, it was found that their average age was 40 years, and that their average period of work then completed was 25 years. Of the mining population one-third only had reached 50 years of age, whilst of the non-mining population one-third had attained 70 years of age.

I might submit these two examples, the one as a young and comparatively weak population, the other as a comparatively mature and strong population. The adult mining population of 30 years of age is not, I apprehend, a population advancing to a further stage of maturity, but one kept down by noxious agencies and premature mortality to that limit of age, with no chance for them or for other generations to pass beyond it whilst in this employment, except through the operation of sanitary measures in removing the causes of depression.

The difference in the proportions of ages between a depressed and unhealthy and a comparatively long-lived and strong population, is shown in the following comparative view of the ages of the miners and of the 1033 non-mining labourers who were living and working:—

—	30 Years of Age and under 40.	40 Years and under 45.	45 Years and under 50.	50 Years and under 55.	55 Years and under 60.	60 Years and under 70.	70 Years and under 80.	80 Years and upwards.
Miners. . . 1651	772	377	239	125	56	29	1	..
Labourers . 1033	695	422	Not given.	284	Not given.	144	48	7
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Miners	47	23	14	7½	3½	1½	..	..
Labourers	67	41	..	27	..	14	4½	½

So that whilst in every 100 men of the younger population of workpeople there would not be 2 men of the experience beyond sixty years of age, not 8 above fifty, or not a fourth passed forty; in the older population there would be 14 beyond sixty, 27 beyond fifty, or a clear majority of mature age, and, it may be presumed, of the comparatively staid habits given by age. Dr. Scott Allison found that the average age of the living male heads of families of the *collier* population at Tranent whose condition he has contrasted with that of the agricultural population, and whose ages he could ascertain, was 34 years; whilst the average age of the living male heads of the agricultural families was 51 years and 10 months. He considers that the like proportions would be found to be more extensively prevalent, and would serve as fair indications of the relative condition of the different populations.

Whenever the adult population of a physically depressed district, such as Manchester, is brought out on any public occasion, the preponderance of youth in the crowd and the small proportion of aged, or even of the middle aged, amongst them is apt to strike those who have seen assemblages of the working population of other districts more favourably situated.

In the course of some inquiries under the Constabulary Force

Commission as to the proportions of a paid force that would apparently be requisite for the protection of the peace in the manufacturing districts, reference was made to the meetings held by torchlight in the neighbourhood of Manchester. It was reported to us, on close observation by peace-officers, that the bulk of the assemblages consisted of mere boys, and that there were scarcely any men of mature age to be seen amongst them. Those of mature age and experience, it was stated, generally disapproved of the proceedings of the meetings as injurious to the working classes themselves. These older men, we were assured by their employers, were intelligent, and perceived that capital, and large capital, was not the means of their depression, but of their steady and abundant support. They were generally described as being above the influence of the anarchical fallacies which appeared to sway those wild and really dangerous assemblages. The inquiry which arose upon such statements was how it happened that the men of mature age, feeling their own best interests injured by the proceedings of the younger portion of the working classes, how they, the elders, did not exercise a restraining influence upon their less experienced fellow-workmen? On inquiring of the owner of some extensive manufacturing property, on which between 1000 and 2000 persons were maintained at wages yielding 40*s.* per week per family, whether he could rely on the aid of the men of mature age for the protection of the capital which furnished them the means of subsistence? he stated he could rely on them confidently. But on ascertaining the numbers qualified for service as special constables, the gloomy fact became apparent, that the proportion of men of strength and of mature age for such service were but as a small group against a large crowd, and that for any social influence they were equally weak. The disappearance by premature deaths of the heads of families and the older workmen at such ages as those recorded in the returns of dependent widowhood and orphanage, must to some extent practically involve the necessity of supplying the lapse of staid influence amidst a young population by one description or other of precautionary force.

On expostulating on other occasions with middle-aged and experienced workmen on the folly as well as the injustice of their trade unions, by which the public peace was compromised by the violences of strike after strike, without regard to the experiences of the suffering from the continued failures of their exertions for objects the attainment of which would have been most injurious to themselves, the workmen of the class remonstrated with, invariably disclaimed connexion with the proceedings, and showed that they abstained from attendance at the meetings. The common expression was, they would not attend to be borne down by "mere boys," who were furious, and knew not what they were about. The predominance of a young and violent majority was general.

In the metropolis the experience is similar. The mobs against which the police have to guard come from the most depressed districts; and the constant report of the superintendents is, that scarcely any old men are to be seen amongst them. In general they appear to consist of persons between 16 to 25 years of age. The mobs from such districts as Bethnal Green are proportionately conspicuous for a deficiency of bodily strength, without, however, being from that cause proportionately the less dangerously mischievous. I was informed by peace officers that the great havoc at Bristol was committed by mere boys.

The experience of the metropolitan police is also similar as to the comparatively small proportion of force available for public service from such depressed districts. It is corroborative also of the evidence as to the physical deterioration of their population, as well as the disproportion in respect to age. Two out of every three of the candidates for admission to the police force itself are found defective in the physical qualifications. It is rare that any one of the candidates from Spitalfields, Whitechapel, or the districts where the mean duration of life is low, is found to possess the requisite physical qualifications for the force, which is chiefly recruited from the open districts at the outskirts of the town, or from Norfolk and Suffolk, and other agricultural counties.

In general the juvenile delinquents, who come from the inferior districts of the towns, are conspicuously under size. In a recent examination of juvenile delinquents at Parkhurst by Mr. Kay Shuttleworth, the great majority were found to be deficient in physical organization. An impression is often prevalent that the criminal population consists of persons of the greatest physical strength. Instances of criminals of great strength certainly do occur; but speaking from observation of the adult prisoners from the towns and the convicts in the hulks, they are in general below the average standard of height.

Reverting to the observations as to the influence of adverse physical circumstances on the morals of the population, I must here include in the observation the younger portion of the population.

I might adduce the evidence of the teachers of the pauper children at Norwood to show that a deteriorated physical condition does in fact greatly increase the difficulty of moral and intellectual cultivation. The intellects of the children of such inferior physical organization are torpid; it is comparatively difficult to gain their attention or to sustain it; it requires much labour to irradiate the countenance with intelligence, and the irradiation is apt to be transient. As a class they are comparatively irritable and bad tempered. The most experienced and zealous teachers are gladdened by the sight of well-grown healthy children, which presents to them better promise that their labours will be less difficult and more lasting and successful. On one occasion a comparison was made between the progress of two sets of children in Glasgow, the one

set taken from the wynds and placed under the care of one of the most skilful and successful infant schoolmasters, the other a set of children from a more healthy town district and of a better physical condition, placed under the care of a pupil of the master who had charge of the children from the wynds. After a trial for a sufficient time, the more experienced master acknowledged the comparative inferiority of his pupils, and his inability to keep them up to the pace of the better bodily conditioned children.

The facts indicated will suffice to show the importance of the moral and political considerations, viz., that the noxious physical agencies depress the health and bodily condition of the population, and act as obstacles to education and to moral culture; that in abridging the duration of the adult life of the working classes they check the growth of productive skill, and abridge the amount of social experience and steady moral habits in the community: that they substitute for a population that accumulates and preserves instruction and is steadily progressive, a population that is young, inexperienced, ignorant, credulous, irritable, passionate, and dangerous, having a perpetual tendency to moral as well as physical deterioration.

The group of cases of the mining population from Alston and Garrigill, it appears to me, will, when considered, afford an example of the powerful nature of the physical elements of deterioration. In that district the employers and persons of the higher classes have paid great attention to maintain the means of moral improvement. They have only not been made aware of the practicability or of the importance of sustaining the physical condition of the workpeople, as exemplified in respect to the same description of labourers at Camborne.

The duration of life amongst the mining population of the lead-miners at Alston and Garrigill, and the adjacent district, is about 14 years less than that given by the Swedish tables. Their physical condition was depressed. "The young men appeared very healthy, but exceedingly few of them," says Dr. Mitchell, "were of a large size; and in general it may be said they are of a small size." He states that in moral condition they are most exemplary:—

"The means of education in Alston parish are extensive: there is the grammar-school, the master of which must be acquainted with Latin, but he gives a general education; there is a charity-school, and a school kept by a master on his own account; there is the school of the London Lead Company at Nenthead, at which other children besides those of their own workpeople are allowed to attend. There is a school at Garrigill Gate, and one at Tynehead, and another at Leadgate; there are also many dame schools and 10 Sunday schools. * * * I procured the catalogues of several libraries, and the books are such as to convey valuable information, and are far superior to most of the works which are found in the catalogues of the institutions called literary and scientific in and about the metropolis. * * * As to the intellectual condition of the people, it is decidedly superior to that of any district of

England of which I have any knowledge. The witnesses uniformly manifested a clearness of comprehension of the inquiries made of them, and gave distinct replies, and added of themselves other information bearing on the subject. Almost all of them could sign their evidence, and most of them wrote exceedingly well. * * * The evidence of the employers and the parochial authorities, as well as of the men themselves, fully proves that there is a very general sobriety, and that the contrary practice is exceedingly rare. * * * Offences against property are very rare. It may be doubted whether we may consider it a proof of the honesty of the people, that pigs of lead may be seen lying by the road sides and in the fells as much exposed as so many stones. There is no magistrate nearer to Alston than a distance of 14 miles. Offences against the law are very rare."

Instances have been frequently presented in the course of this inquiry of the moral degradation of the children of workpeople, and of the workpeople themselves, who have once been what those miners now are in moral condition; but the cases taken from the pauper roll of the union will serve to show that even a good education will not, of itself, sustain such a body of workmen against the physical causes of depression. The group of cases of widowhood, when considered, will serve to show that the causes in question create the evils of which they are supposed to be natural correctives.

With such an educated class of workmen, the obtainment of a place and the wages of an adult must be the necessary preliminary to a marriage, and unless such place or wages were obtained, he young workman would either remain single or seek employment further a-field. But we will suppose, for illustration, that a casualty occurs, such as the last death on the list, J. M., where a young miner who has married and has a wife and two children is prematurely swept away by an epidemic at 21 years of age, leaving a widow and two destitute orphan children dependent on poor relations, or on the ratepayers. The first mentioned, say S. H., then takes the vacant place of work, marries, and is killed at 34 years of age by "an accident in the mine," leaving a widow and seven orphan children. This third vacancy in the place of work is occupied by another miner H. Y., who marries and works until he is 45, when he is killed by "consumption," leaving a widow and five children.

Such casualties do not of course actually so fall on any one place of work, but the vacancies so created in different places at the younger periods of life must be and are supplied by new hands coming into the employment, and marrying as a consequence of that employment, and the succession will fairly represent the mode in which the vacancies created by the various causes of death displayed in the last table and in the other tables of the causes of premature widowhood and orphanage occur.

In works where the average period of working ability is extended to the natural period of superannuation, which the evidence

shows that a combination of internal and external sanitary measures may be expected to give, namely an average of full 60 years, the account for one place would be one superannuated workman and one widow, and a family of four or five well-grown children, who, having received parental care during that period, will probably all have obtained, before its termination, the means of independent self-support. Whereas with a population of only 15 or 20 years of working ability, the same place of work may during the same period have been filled by two generations and one-fourth of workpeople, not one of which has brought all the children dependent on it to maturity or a condition for self-support; and the account of widowhood and orphanage will frequently for the same place of work stand thus:—

Workmen prematurely Dead.	Orphan Children.	Years' loss of Support.
J. M. 1 widow . .	2	39
S. H. 1 „ . .	7	26
H. Y. 1 „ . .	5	15

That is to say, three widows instead of one, and three sets of stunted and unhealthy children dependent for such various periods, as those above specified, and competing for employment at the same place, instead of one set of healthy children arrived at the age of working ability for self-support. The occupation of the places of work by a comparatively young and procreative population, brought forward by the premature removal of the middle aged and the aged workers, by the various causes of premature deaths—the acceleration of births by premature deaths in infancy as stated in a preceding note—will, I apprehend, sufficiently clearly account for the generally increased proportions of births in those districts where the rate of mortality is high; and it will scarcely be necessary to give further illustrations of the dreadful fallacy which tends to an acquiescence in the continuance of the causes of pestilence and premature mortality as "correctives of the pressure of population."

Though the deaths from accidents bear only a small proportion to the deaths from disease, yet registries show that the scattered deaths from various descriptions of violence amount to an average of about 12,000 yearly, in England and Wales alone, or more than aroused the national attention in the late massacre of the troops of the empire during the war in India. The position which this class of causes occupy, in the production of destitute orphanage and widowhood, is shown in the previous tables; but these do not comprehend the whole of the effects; another class of which appear on examining the causes of pauperism: namely, the injuries which occasion permanent disablement. In an analysis of the causes of pauperism, by *Mr. Simkiss*, the auditor of the Wolverhampton union, the cases of which the subjoined is a list were apparent on the pauper-roll.

No. of Cases.	Previous Occupations of the Paupers.	Nature of Accident.	Respective Ages.
18	Miners	Hurt in mines . .	21, 23, 27, 30, 34, 34, 40, 40, 43, 44, 47, 49, 50, 50, 51, 53, 60, 60.
2	Ditto	Burnt in mines . .	40, 60.
1	Locksmith. . .	Lamed by accident .	30.
1	Wheelwright . .	Accident by waggon.	69.
1	Single woman . .	Lost her arm by accident.	23.

On examining the individual cases of deaths that are classed as incident to the pursuit of the chief branches of mining or manufacturing industry, or in transport whether by land or water, it has always been satisfactory to find that for the future, by care, the greater proportion of them are preventible. In the case of the mining accidents, one part of them appear preventible by care of the superior managers of the mines—in arrangements over which the individual workman has no control; the other portion, by intelligence and care on the part of the workmen; and this last class of cases again reverts back to the power, and therefore to the means of imposing responsibility on the employers in the selection of educated and intelligent workmen—of habits of sobriety, and care to qualify them for works of danger. But at present they are, in a great measure, relieved from responsibility by the charge incurred by the want of care being thrown on other funds raised from persons who have as yet no practicable means of protection or prevention. When continued and dreadful losses of life take place, in the face of examples of successful prevention such as might be collected from every part of the country, it is impossible to avoid the conclusion that if the branch of industry were charged with the pecuniary consequences of the losses assumed to be necessarily incident to it, generations would not be allowed to pass away in fear, recklessness, and misery without the early adoption of those means of prevention which self-interest would then stimulate. A frequent suggestion made upon the view of such casualties is that government inspectors should be appointed to inspect and direct and regulate machinery.

This subject was brought under consideration in the course of the proceedings of the Factory Commission of Inquiry, and it was then agreed that such a measure as that of inspection would only give an imperfect security, and would occasion vexatious interruptions, and that the least objectionable mode of interference, as well as the most efficient and just as a means of prevention, would be to charge a portion at least of the cost of such casualties upon the branch of industry. Subsequent observation, especially of the causes of pauperism, have strengthened my convictions of the

soundness of the principle of prevention as stated in our Report, a passage from which I have submitted in the Appendix.*

In illustration of the pecuniary cost of disease, as shown in the cost of remedies in Scotland, there are several documents. The late *Dr. Cowan,* the professor of Forensic medicine at Glasgow, gives one in which he states—

"If any arguments were wanting to arouse the community to the investigation of this important subject, they might be drawn from the heavy pecuniary tax which fever entails on the benevolent of our city, from the poverty, misery, and crime which this disease engenders. It is not possible, from the data before me, to give anything like an accurate calculation of the sums spent for the treatment of fever in Glasgow during the last twenty years. The following calculation intentionally falls considerably under the amount, to prevent every suspicion of exaggeration:—

	£.	s.	d.
1. Cost of the fever hospital	8,566	7	9
2. Temporary hospitals, and maintenance of patients in them	5,000	0	0
3. 21,691 patients at 1*l.* 10*s.* treated at the expense of the infirmary	32,536	10	0
	£46,102	17	9

To this amount fall to be added the expense of treating the poor in their own houses under the district surgeons of the burgh, and any sums expended by the heritors or the gorbals and barony parishes for similar purposes. But this sum must have been greatly increased by the demands of pauperism produced by fever, on our poor's-rates, and on the private benevolence of our citizens; for the duration of the disease, and the period of convalescence which must elapse before an individual can resume his work will average rather more than six weeks, and when to this is added the difficulty of again finding immediate employment, we may safely assume that the 12,895 individuals treated in the fever hospitals during the last seven years, all, with few exceptions, depending on their daily labour and extending the benefit of that labour to others, were out of employment for a period of at least six weeks."

The *Rev. G. Lewis,* the minister of St. David's parish, Dundee, who has answered the queries issued by the Board, and very powerfully addressed the inhabitants on this subject, in the course of one of his addresses, observes that—

"Apart altogether from the waste of human life, and the indescribable suffering and sorrow which annually fall upon the working classes of Dundee from this periodical scourge, and viewed only as a mere matter of profit and loss to the mercantile and monied interest of Dundee, it were easy to demonstrate, that the expenditure of several thousand

* I am informed that regulations on the principle of those we recommended, under the Factory Commission for the Protection of Adult Workmen from the consequences of Accidents, are now adopted in the Prussian code, and practically enforced.

pounds per annum, in providing the means of cleanliness to this town, in the better cleansing of its streets, but, above all, of its back closes, courts, and lanes, and the clearing away of those pestilential masses of building which lie concealed from view behind the front lines of some of our principal streets, would have been rewarded by a saving to the community of a vast sum, which the ravages of disease and death have been, for the last few years, compelling Dundee to pay in a way its inhabitants think not of. That this may appear, I have brought into one table the number of cases of fever during the last seven years.

"Cases of Fever in Dundee during the last seven years, from 1833 to 1839, inclusive, calculated from the Bills of Mortality according to the proportion of nine cases to each death :—

Year.	Cases.	Deaths.
1833	1,188	132
1834	1,521	169
1835	1,179	131
1836	2,673	297
1837	1,881	209
1838	1,773	197
1839	1,593	177
	11,808	1,312

"Thus, in seven years, fever has fallen on much more than a tithe of the inhabitants,—choosing its victims here, as elsewhere, in the manhood of life, and compelling the citizens of Dundee to pay a tax frightful in the amount of personal sufferings and family bereavements.

"But it were a mistake to imagine that the sufferings and death of so many citizens are the only *tithes* which fever has compelled us to pay during the last seven years. Put wholly aside the details of domestic woe and personal suffering which 11,808 cases of fever have introduced into the families of Dundee in these seven years—omit all reckoning of the watching, want, and wretchedness, wrapped up in so many cases of acute disease, and the family bereavements implied in these 1,312 death—and let us view for a moment our fellow-creatures but as so many machines suspended from work by the derangement or destruction of the human machinery, that we may learn something of the probable money loss incurred by fever in these seven years.

"From Dr. Southwood Smith, the highest authority on these subjects, we learn that fully one-half of the cases of fever occur in the prime of life, when men are most useful either to their families or to society. Deducting then the 1,312 deaths from the whole number of cases, there will remain 10,496 cases of fever, the one-half of whom, at least, were adults,—that is, 5,248 persons in the prime of life, very many of them heads of families, had fever in these seven years. Now, the average period fever detains a patient from work, according to the same authority, is six weeks. Let us take the earnings in health of these adults at the average of 8*s.* weekly; and the loss of wages to these 5,248 adults, by six weeks' fever, amounts to 12,595*l.*; and this, after excluding all under age, and all the deaths. But these cases, whether treated at home or at the infirmary, must be also loaded with the expense of medical treatment,

which is estimated in our infirmary reports at 1*l.* to each case, that is, 5,248*l.* must be added to the loss by wages. But 5,248 cases of those under age remain to be accounted for; and, as fever rarely attacks mere children, but chiefly those either in manhood or approaching manhood, we may estimate the loss of their labour at the one-half of the adults, or 6,297*l.* 12*s.*, and the expense of attendance and recovery at one-half also, or 2,624*l.*

"But how shall we estimate the pecuniary loss of 1,312 deaths? It seems a strange thing to go about estimating the money value of that which money did not give, and cannot restore when taken away; yet as there are those who understand better a profit and loss account than the arguments of religion and humanity, we shall attempt to estimate the money loss of these 1,312 deaths by fever.

"At least one-half, or 656 of these deaths, were deaths of adults, and very many of them heads of families, of which the 337 widows in St. David's parish afford melancholy evidence."

He then refers to an estimate made by *Mr. M'Culloch,* who, viewing a human being as a productive machine, reared to last a certain time, and to return so much more than he costs, estimates a full-grown workman just arrived at maturity as having 300*l.* of capital invested in him. At the actual cost of maintaining and training a pauper child in England at the school in Norwood, 4*s.* 6*d.* per week, he will have had expended upon him at 21 years of age, 245*l.*, or at 30 years, 350*l.*; but he supposes—

"The money value of these male and female adults to be just the one-half of this, or 150*l.*, which makes the loss, by the premature death of these 656 adults, to be 98,400*l.*; and, if the remaining 656 under the age of maturity, yet approaching it, be taken at the half of the adults, or 75*l.* each, we have a loss of 49,200*l.* more; to which, if we add 1*l.* a-piece, or 1,312*l.* in all, for attendance and medical expenses, the Fever Bill of Dundee, during the last seven years, will stand as follows:—

Fever Bill of Dundee from 1833 to 1839.

	£.	*s.*	*d.*
Loss of labour for six weeks of 5,248 adults, at 8*s.* a-week	12,595	0	0
Attendance, medicine at home or infirmary, at 1*l.* each	5,248	0	0
Loss of labour for six weeks of 5,248 under age, at 4*s.* a-week	6,297	12	0
Expense of treatment of the above at infirmary or home, at 10*s.* a-piece . . .	2,624	0	0
Loss by death of 656 adults, at 150*l.* each .	98,400	0	0
Loss by 656 deaths under age, at 75*l.* a-piece	49,200	0	0
Treatment of 1,312 cases, at 1*l.* each. . .	1,312	0	0
	£175,676	12	0

Or 25,096*l.* 13*s.* per annum.

"The poor, we are told, we shall always have with us, and so with disease and death. Yet the evils, both of poverty and disease, come in

very different measures to different communities. As there is a poverty that is self-inflicted, and may be self-removed, so there is a certain amount of disease and annual mortality in every city that is self-inflicted; and the community that does not strive, by every available means, to reduce its disease and mortality bills to the lowest sum of human suffering, and the lowest rate of annual mortality, is as guilty of suicide as the individual who, Judas like, takes with his own hands the life God has given, and hurries unbidden into the presence of his Judge. The fever bills of the Scottish towns, contrasted with those of the English commercial towns, declare too plainly that man has not yet done his part in Dundee to avert this scourge of society; and, while fever is undoubtedly to be regarded as the visitation of God, it is also to be regarded as the visitation of God for the sin of neglecting a population fallen in character and habits.

In the following table are given the deaths in Dundee in seven years, and the rate to the population,—supposing the inhabitants in 1831 to have been 45,355 souls, and to have increased about 2000 annually, until 1839, when from bad trade the increase was checked :—

Years.	Deaths.	Population.	Proportion of Deaths to the Population.
1833	1,482	49,355	1 in 33·3
1834	1,650	51,355	1 in 31·1
1835	1,673	53,355	1 in 31·9
1836	1,923	55,355	1 in 28·8
1837	1,963	57,355	1 in 29·2
1838	1,511	59,355	1 in 39·3
1839	1,763	59,355	1 in 33·7
	11,965	385,485	1 in 32·2

Thus, the average mortality in Dundee, during the last seven years, was 1 in 32 annually. * * * Here, then, in Dundee, the deaths annually are at least one-fourth more than over the rest of Scotland, Glasgow excepted, which seems to surpass Dundee in the waste of human life. If the deaths are a fourth greater, those diseases which are its harbingers must be many times greater than the deaths; and to this extent, at least, it was in the power of human means to have provided a remedy,—to have abated by one-fourth the physical suffering and mortality of Dundee, saved 2,952 persons from fever, and 328 persons from premature death, and reduced by a fourth part the pecuniary loss incurred during the last seven years,—in other words, to have saved 43,919*l.*, or 6,274*l.* annually, to the profit and loss account of this city in the single item of fever.

"The statistics of small-pox in Dundee might be added to this bill of charges. It is sufficient, however, to allude to it. Last year, the deaths by small-pox were 77. In 1838, they were also 77; and in 1837, they amounted to 126. The number of cases, of course, must have been many times the deaths; by far the greater number under age and unvaccinated,—a neglect no longer confined to the Irish population.

* * * * * *

"Though I am no medical authority, yet I am sure that I have every medical authority with me when I connect, as foremost amongst the causes of the enormous Fever Bill of Dundee that monstrous Tavern Bill, which last lecture I showed you was the worm in the bud of the happiness and well-being of its working classes. That Tavern Bill, according to the mean of three different estimates, amounts to 21,234*l.* a-year in my parish alone, and to 180,000*l.* a-year to all Dundee. In vain we cry out against the taxation of Government. While the words of complaint are on our lips, here is a vice of continual tasting and tippling in strong drink,—a private self-imposed tax, but heavier far than any public tax. It is this besetting sin that has been not only devouring the substance of the poor, but every year sowing the seeds of that enormous Fever Bill which for the last seven years has been taxing us, not only in purse but in person,—compelling every tenth man in Dundee during that period to pay the wages of six weeks' labour, and to suffer all the langour, sickness, and oppression of six weeks' fever, besides the bereaved widows and orphans, and the fatherless and motherless children it has left in Dundee."

I now proceed to submit the reasons for believing that the immediate expenditure of so much money as would be incurred by the adoption of such of the remedial measures as appear to be available by the agency of any public administration would be sound measures of immediate economy, and of ultimate public gain: and also the grounds for believing that the same conclusion is applicable to the cost of those measures of prevention which, though directly or indirectly controllable by legislative authority, are within the province of private individuals to execute, such as the construction of the dwellings of the labouring classes.

VI.—EVIDENCE OF THE EFFECTS OF PREVENTIVE MEASURES IN RAISING THE STANDARD OF HEALTH AND THE CHANCES OF LIFE.

On viewing the evidence, which shows that in most situations higher chances of life belong to the middle and higher classes of the population, an impression may be created that the higher standards of health are essentially connected with expensive modes of living. The highest medical authorities agree, however, that the more important means for the protection and advance of the health of those classes must be in still further reductions than those which it is the present tendency in the higher classes of society to make of the use of highly stimulating food. The evidence already adduced with respect to the labouring classes in the rural districts and those living on high wages in towns, will have gone some way to remove the erroneous impression with respect to them, and it admits of proof that a higher standard of health and comfort is attainable for them even at a less expense than that in which they now live in disease and misery. The experience of the effect of sanitary measures in the royal navy may be adduced as evidence of the practicable standards of health consistent with great labour and exposure to weather