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REPORT
ON
ALCOHOL AND LONGEVITY.

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REPORT
ON
ALCOHOL AND LONGEVITY.

OF late years the connection between the consumption of alcohol and duration of life has excited great interest, and many attempts have been made to discover whether the evil effects were caused only by excess, and, if so, where moderation passed into excess, or whether alcohol was always injurious, the amount of injury caused being proportionate to the quantity consumed.

Intemperance has by medical opinion been long recognised as a cause of death, and even in old writers this is seen. I shall only quote two sentences which show that the fallacy of arguing from individuals and the heredity of alcoholic habits have long been known. Bishop Berkeley^a illustrates the first point—"Albeit, there is in every town or district in England some tough dram-drinker set up as the devil's decoy to draw in proselytes."

Erasmus Darwin^b alludes to the second point—"It is remarkable that all the diseases arising from drinking spirituous or fermented liquors are liable to become hereditary even to the third generation, gradually increasing, if the cause be continued, till the family becomes extinct."

Avoiding many other tempting quotations, I shall endeavour in this paper to present an account of the various efforts which have been made from time to time to estimate the mortality caused by alcohol, and the evidence which can be given in support.

It will be seen that the chief useful sources of information are—
(1). Direct investigation into the causes of a number of deaths.
(2). Experience of benefit societies. (3). Experience of insurance societies. I have endeavoured to present them clearly and concisely, using the original words when possible, and giving the reference where the original can be consulted. I have myself carefully examined the original before making any quotation, and any statement which could not be traced to its exact source I

^a Essay on Tar Water.

^b Botanic Garden. Part II. Note on *Vitis*.

have omitted. My object has been to arrange my facts so that they might speak for themselves.

The first statistics deal chiefly with the intemperate use of alcohol.

MORTALITY OF THOSE ENGAGED IN THE LIQUOR TRAFFIC.

In Table L of the 45th Annual Report of the Registrar-General for England, the mortality of those connected with the distribution of drink is compared with that of other classes, with the following result:—

Average mortality of all males taken as	. . . . .	1,000
„ „ Clergy was	. . . . .	556
„ „ Brewers was	. . . . .	1,362
„ „ Innkeepers, Publicans, and Beer Dealers		1,521
„ „ Public House and Hotel Servants	. . . . .	2,205

Dr. Ogle wrote ^a:—“The mortality of men who are directly concerned in the liquor trade is appalling.”

This is supported by the experience of the Scottish Amicable Life Assurance Society, from 1826 to 1876, which shows that the mortality amongst males occupied in inns and public-houses was 68 per cent. in excess of the Actuaries' or Healthy Males Table, and 49 per cent. in excess of the English Life Table (No. 2. Males).^b

VITAL STATISTICS OF THE INTEMPERATE.

Mr. Neison, in his well-known work on Vital Statistics,^c threw a flood of light on the question. He obtained particulars as to age, habits, &c., of a number of persons, and by an ingenious plan of arranging the particulars of each case upon a card whose colouring divided the cases into various classes, he was enabled to arrange and rearrange his facts until he had worked out an immense number of averages.

The first table^d of all ages taken together shows:—

The number who ought to have died, according to general rate for England and Wales	. . . . .	110·2
The number of intemperate who died	. . . . .	357·0

Mr. Neison remarks^e—“Throughout the whole range of the

^a Supplement, p. 36.

^b On the Mortality amongst Publicans, &c. By John Stott. Journal of Institute of Actuaries. 1876.

^c Contributions to Vital Statistics. By F. G. P. Neison, F.I.A.

^d Neison, *op. cit.* 3rd Ed. London, 1857, p. 201, et. seq.

^e *Op. cit.* P. 204.

table it will be seen that the rate of mortality is frightfully high, and unequalled by the results of any other series of observations made on any class of population of this country. Sanitary agitators have frequently excited alarms about the wholesale havoc in human life going on in the badly conditioned districts of some of our large cities; but no collection of facts ever brought under attention has shown so appalling a waste of life as is exhibited by the above results."

Mr. Neison contrasts the death-rate of the intemperate with the general death-rate (which, of course, includes the intemperate, and must be raised by them above the death-rate of the temperate).

Equation of Life, being the period of years of which there is an equal chance of living.

Ages	General Population of England and Wales	Persons of Intemperate Habits	
20	44·212	15·557, being 35 per cent.	} Of the duration of life in the General Population.
30	36·482	13·800 " 38 "	
40	28·790	16·627 " 40 "	
50	21·255	10·860 " 51 "	
60	14·285	8·947 " 63 "	

The above Table shows how fearfully the expectation of life is lessened at all ages by the contraction of intemperate habits.

Dividing the cards into "Occupation Groups," Mr. Neison found:—

The average Duration of Life, after the Commencement of Intemperate Habits,

Among Mechanics, Working, and Labouring Men	. . . . .	18 years.
Among Traders, Dealers, and Merchants	. . . . .	17 "
Among Professional Men and Gentlemen	. . . . .	15 "
Among Females	. . . . .	14 "

INQUESTS AND INTEMPERANCE.

Coroners, from the nature of their work, have long recognised alcohol as a frequent direct cause of death, but they have also recognised its indirect action—for instance, so early as 1759, Mr. Corbyn Morris stated that as a consequence of the very general use of ardent spirits there was "a loss of 80,000 infants in the course of 20 years—a mortality unequalled in the annals of human misery and woe." ^a

^a Observations on Bills of Mortality in London, 1759. By Corbyn Morris.

At an inquest held in June, 1839, the coroner, Mr. Wakley, said:—"I think intoxication likely to be the cause of one-half the inquests that are held." Mr. Bell, the clerk to the inquests, observed that the proportion so occasioned was supposed to be 3 out of 5. "Then," said Mr. Wakley, "there are annually 1,500 inquests in the Western Division of Middlesex, and according to that return 900 of the deaths are produced by hard drinking." Not long afterward, at another inquest, Mr. Wakley, said—"I have lately seen so much of the evil effects of gin-drinking that I am inclined to become a teetotaller. Gin may be thought the best friend I have; it causes me to hold annually 1,000 more inquests than I should otherwise hold. But besides these I have reason to believe that from 10,000 to 15,000 persons die in this metropolis annually from the effects of gin-drinking upon whom no inquests are held."^a

THE REGISTRAR-GENERAL'S RETURNS.

It might be thought that in the return of the Registrar-General the true mortality arising directly from alcohol might be found. This is not, however, the case. I believe that the yearly deaths from intemperance entered in the returns of the Registrar-General for England have never been higher than between 1,400 and 1,500. This would not be enough to account for even the extra deaths amongst drink-sellers; much less would it account for the deaths amongst the whole community. At present alcoholism is only given as the cause of death when present in some acute form, such as *delirium tremens*. In most other cases there is some other disease (possibly caused or rendered more fatal by the alcoholism), and it is this disease which is registered. The fact that the certificate is not treated as a confidential document prevents medical men entering alcoholism if they can possibly help it.

DR. NORMAN KERR'S RESEARCHES.

Guesses have frequently been made as to the mortality arising from alcohol, but the first careful and sustained attempt to arrive at a correct estimate of the mortality ascribable to alcohol, and the different effects caused by its moderate and excessive consumption, was made by Dr. Norman Kerr, who communicated his results in a paper read at the Social Science Congress.^b The

^a "Bacchus." By Dr. R. B. Grindrod. 1839. P. 132.

^b Cheltenham Meeting. October, 1878.

author combatted the extraordinary opinion enunciated by Dr. Farr, in a letter addressed to the Registrar-General, that the deaths from alcohol were rapidly decreasing, and were very few in number—less than 1,500 persons being returned as dying from alcohol in 1876; and went on to show how very different was the true state of matters.

In order to arrive at an approximation to the truth Dr. Kerr kept a careful record of all deaths occurring in his practice. In one period of twelve months he either certified to the registrar, or testified before the coroner, to the causes of death of 55 persons; and he knew that 13 of these had died either from their own intemperance or from disease or accident arising from the intemperance of others. As there were some 16,000 practitioners of medicine in the kingdom, after deducting a proportionate number of cases for the unusual extent of his practice, and the increased mortality he had experienced in his Poor Law work, this gave a total annual mortality from alcohol, for the whole country of 128,000. Astounded at these terrible figures, Dr. Kerr endeavoured to check their accuracy by a variety of methods. He examined his entire death-roll for seventeen years, and found that the average annual alcoholic fatality, calculated as before, during that whole period, was 120,800. Dr. Kerr then gave a summary of the cases of deaths from drink in the practice of twelve medical men in different parts of the country, showing a considerably higher death-rate than even his own had done.

Not satisfied even with this corroboration of the moderation of his estimate, Dr. Kerr proceeded to calculate the mortality on a wholly different basis. Taking Mr. Neison's death-rate of drunkards,^a there being admittedly 600,000, the number of the intemperate dying annually was 40,500. If to these were added one-fourth of the infant mortality, as due directly or indirectly to alcohol—65,000—there remained, say of 120,000, only the very small number of 14,500 for the deaths from violence and accident, other deaths from excess, and the great multitude of wives, and children beyond the age of five, dying from their own drunkenness or the drunkenness of others.

Dr. Kerr made still another estimate, based on a totally different calculation. More than 70,000 persons died every year in public institutions, such as hospitals and workhouses, and of these deaths at least a third, or 23,627, were the effect of intemperance. Fully

^a *Cf. ante.*

12,000 engaged in the liquor traffic died annually, and more than 11,500 succumbed to violence consequent on drinking. If to these were added the alcoholic infant mortality, only 7,873 remained for all other alcoholic causes of death, to reach the previous reckoning of 120,000. Dr. Kerr gave as his own opinion that if the truth were fully disclosed the number of deaths annually arising directly or indirectly from drink would be found to be nearer 200,000.

When Dr. Kerr's paper was read Dr. Farr occupied the chair, and seemed astonished at the figures, but Dr. Hardwicke^a stated that in his opinion Dr. Kerr's estimate would be ultimately found to be under the truth, and before the close of the proceedings Dr. Farr admitted that perhaps between 30,000 and 40,000 persons might die directly from alcohol every year, which was not far from the 40,500 contended for by Dr. Kerr.

At the meeting of the Sanitary Congress^b in the following year Dr. Kerr returned to the subject, correcting his figures, as he had found there were 18,000 medical men practising in the country, and not 16,000, as he had assumed in the previous year. This brought the numbers to 45,562 dying from personal intemperance and 89,437 from the intemperance of others, making a total of 134,999.

In the succeeding nine years Dr. Kerr found a steady decrease in the premature mortality from alcohol. In his treatise on Inebriety,^c published in 1888, he estimated the number of persons dying annually from personal intemperance at 40,000. The number of those who had succumbed indirectly from the intemperance of other individuals he put at 80,000.

DR. MORTON'S STATISTICS.

The next investigation was made by Thomas Morton, M.D., who collated the result of his own personal experience and that of nineteen medical friends, and got 39,287 as the deaths wholly or partly due to alcohol in England and Wales. This was equal to 52,640 for the United Kingdom. In his calculation he included only about half the deaths which occurred in workhouses and none of those occurring in hospitals or asylums.

^a Coroner for Central Middlesex.

^b Croydon, 1879.

^c Inebriety: its Etiology, Pathology, Treatment, and Jurisprudence. London: H. K. Lewis. Pp. 379, *et seq.*

Dr. Morton brought the result of his investigations before the Harveian Society,^a and showed how, in his opinion, the deaths appeared in the Registrar-General's return. He suggested that a committee should be appointed to investigate the matter in the same way, but on a more extended scale. This proposition was seconded by Dr. Norman Kerr, and carried unanimously, the appointment of the committee being left to the council.

THE HARVEIAN SOCIETY'S INVESTIGATION.

The Committee, after a careful investigation reported to the Society.^b They stated that they had confined themselves to the metropolis, and had got information from medical men as to the habits of 10,000 cases (above twenty years of age) whose deaths had been registered. Of these 7,505 were certified by private practitioners, 1,183 in workhouses, infirmaries, and lunatic asylums, 646 in hospitals, and 666 inquests. The following was the result:—

A. Deaths in no wise due to alcohol	-	-	-	8,598
B. Deaths accelerated or partly caused by its abuse	-	-	-	1,005
C. Deaths wholly due to it	-	-	-	397

This "gives 1,402 deaths—as nearly as possible 14 per cent.—in the causation of which alcohol appears to have played some part. If this part were in all cases a leading one it would correspond to an annual adult mortality of about 5,870 from alcohol in London, or 38,971 for England and Wales, assuming for the moment that the metropolitan figures would apply to the whole country."^c This would make the figures for the United Kingdom about 52,000.

Of course in some of the cases in Class B, the influence of alcohol must have been much less than other cases of the same class, but in all the cases alcohol was stated by the medical man who had certified to the death to have partly caused or accelerated the death.

The proportion of cases occurring in Class C varies with the source of the information.

In hospitals it equalled	-	-	1.55 per cent.
In private practice it equalled	-	4.317	„
In infirmaries	„	-	2.133 „
In inquests	„	-	5.6 „

^a November 21st, 1878.

^b November 16th, 1882. *British Medical Journal*, January 20th, 1883.

^c Report.

The small proportion amongst the hospital cases is explained by the previous history of the patient being so often unknown, and by the regulation of the committee that in the case of hospital returns no case was entered in Class C without verification by a *post-mortem* examination.

The committee did not deal with the deaths caused indirectly by alcohol.

THE COLLECTIVE INVESTIGATION.

The next systematic attempt to arrive at the alcoholic death-rate was made by the British Medical Association. Circulars were issued to the members of the Association, on May 9th, 1885, asking them to fill in from the counterfoils of their death-certificate books particulars of each case, noting whether they were—

- A. Total abstainers.
- B. Habitually temperate.
- C. Careless drinkers.
- D. Free drinkers.
- E. Decidedly intemperate.

In case of doubt as to which of two classes a patient should be considered as belonging, he was to be placed between the two by joining the letters, as AB, CD. In case of still further uncertainty a blank was to be left.

The Report^a was presented by Dr. Isambard Owen, at the Annual Meeting of the British Medical Association in Dublin, August, 1887.

Of the 4,234 males over the age of twenty-five reported on, about 45 per cent. were habitually moderate in their alcoholic habits, 25 per cent. were careless, and 30 per cent. more or less distinctly intemperate (15 per cent. decidedly so).

The following are the only paragraphs in the summary of the Report which deal with longevity:—

“1. That habitual indulgence in alcoholic liquors, beyond the most moderate amounts, has a distinct tendency to shorten life—the average shortening being roughly proportional to the degree of indulgence.

“2. That of men who have passed the age of twenty-five, the strictly temperate, on the average, live at least ten years longer than those who become decidedly intemperate (we have not in

^a British Medical Journal. June 23rd, 1888.

these returns the means of coming to any conclusion as to the relative duration of life of total abstainers and habitually temperate drinkers of alcoholic liquors)."

"12. That total abstinence and habitual temperance augment considerably the chance of a death from old age or natural decay, without special pathological lesion."

An attempt was made (as Dr. Isambard Owen says, "founded on certain statistical figures contained in the Report, which are systematically quoted apart from their context, and in defiance of the explanations therein given") to argue that these figures showed that total abstainers died at an earlier age than moderate or even excessive drinkers, and flyleaves to this effect have been largely circulated by what terms itself, *par excellence*, "The Trade." Dr. Isambard Owen and others have written to show how unjust any such deduction is. The following are the figures:—

The average age at death of

122 total abstainers was	51 years 80 days.
1,529 habitually temperate was	62 ,, 50 ,,
977 careless drinkers was	59 ,, 246 ,,
547 free drinkers was	57 ,, 216 ,,
603 habitually intemperate was	52 ,, 14 ,,

Thus the less alcohol consumed the longer the people lived, but apparently those that took none lived the shortest of all—a manifest paradox!

The fact is that out of the 4,234 cases whose deaths were analysed there were only 122 deaths of total abstainers—a very small proportion, indeed. That their average age was not high is explained by the fact of widespread total abstinence being a comparatively recent thing, and the average age of abstainers is consequently not as high as the average age of non-abstainers; consequently, when the deaths of abstainers are analysed the average age must be comparatively low. To take an extreme comparison—if an inquiry was made into the relative healthiness of medical men and medical students it would be found that the students died at a much lower average age than medical men did. It would not be fair to conclude that the life of the medical student was therefore a more hazardous one. The difference in ages of the two classes would have to be remembered, and the fact that no matter how low the death-rate amongst medical students was, the average duration of life could not be high owing to the individuals composing the class being young.

The check required is to see the relative incidence of deaths out of equal numbers at similar age, but the returns could not provide this.

The *British Medical Journal* wrote^a:—"Rarely has any document been the subject of such extraordinary misconception and misrepresentation as have fallen to the lot of Dr. Isambard Owen's Report of the Collective Investigation on the Connection between Drink and Disease. All over the kingdom Dr. Owen has been represented as laying down, from the returns sent in to this committee, that total abstainers do not live so long as moderate drinkers, or even as those who are actually intemperate. We need hardly say to our readers that Dr. Owen has never said anything of the kind. On the contrary, he distinctly stated that no conclusion could be drawn from the returns as to the relative longevity of teetotallers."

In the account of the Sceptre Insurance Statistics further light is thrown on this fallacy.

PATHOLOGICAL SOCIETY'S DISCUSSION.

Another investigation into the connection between alcohol and disease may be mentioned, although it gives no light on the numerical aspect. On Dec. 4th, 1884, the Pathological Society of London had a discussion on the morbid anatomy and pathology of chronic alcoholism, which was continued on Dec. 18th and Jan. 15th, 1885. One of the most important points established was the intimate connection between alcoholism and tubercle. The work of the Pathological Society will help in one way to check the Registrar-General's return. If the relative rate of mortality amongst the intemperate and temperate from diseases of the various organs can be learned, as the returns of the Registrar-General give the distribution of deaths from diseases of these organs, the approximate number of deaths from alcohol can be calculated.

LONDON TEMPERANCE HOSPITAL.

The London Temperance Hospital should be mentioned, although its experience is neither long nor extensive enough to admit of any certain deductions being drawn. For nearly eight years it was situated in Gower-street, and ten years ago was removed to a specially built building in Hampstead-road. It contains accommodation for

^a September 1st, 1888.

120 patients and is built with all modern sanitary improvements. From its foundation to the end of 1888, 5,390 in-patients were treated, with 333 deaths, the average death-rate being 6.18. As particulars of the cases treated are regularly published, the severity of the class of cases treated can be tested, and it will be found to be about the same as in other general hospitals. It may be mentioned that 2,782 of the in-patients were abstainers and 2,608 non-abstainers.

FRIENDLY BENEFIT SOCIETIES.

A most important assistance in determining the relative health and death-rates amongst abstainers and non-abstainers belonging to the same class, and selected after a similar examination is afforded by the careful actuarial reports on the various Friendly Societies which have lately been published.

Three societies, whose members are drawn from the same class, have recently had their returns carefully analysed—the Ancient Order of Foresters,^a the Manchester Unity of Oddfellows,^b and the Independent Order of Rechabites.^c The years of lives observed in both the Oddfellows and Foresters was very large, being over a million and a quarter in each. In the Rechabites the numbers of years of lives observed were 127,269, but the inquiry in their case had the advantage of extending over ten years.

Before giving Mr. Neison's tables it may be interesting to mention that the Independent Order of Rechabites was founded in 1835 as a friendly benefit society, the members of which should be persons not taking intoxicating drinks, "except in religious ordinances or when prescribed by a physician," and who for weekly payments should be entitled to "sick pay" during illness and "funeral money" at death. The payments vary according to the age at entrance, and from 5s. to 15s. per week, and from £5 to £20 at death can be subscribed for according to the number of shares taken. An analysis of 37,802 members was returned to Mr. Neison on the forms he drew up. Nothing could exceed the care with which Mr. Neison tried to avoid error, and conclusions based on insufficient grounds.

^a The Rates of Mortality and Sickness, according to the Experience for Five Years, 1871-1875, of the Ancient Order of Foresters Friendly Society. By F. G. P. Neison, F.I.A., &c.

^b 1866-1870. Quoted by Neison. Op. cit.

^c The Rates of Mortality and Sickness, 1878-1887, of the Independent Order of Rechabites Friendly Society. By F. G. P. Neison, B.L., F.I.A. Manchester, 1889.

The following table shows the relative rates of mortality for the three societies :—

Ages	Rate of Mortality per cent. per annum		
	Oddfellows, 1866-70	Foresters, 1871-75	Rechabites, 1878-87
Under 25	·632	·753	·603
25	·788	·807	·509
35	1·094	1·174	·619
45	1·647	1·802	1·119
55	2·877	3·286	2·325
65	5·911	6·510	5·815

With regard to the first table Mr. Neison remarks^a:—"The low rate of mortality appears to run through the table, and is not confined to one period of life. To test whether there might be anything in the occupations of the members which would throw light upon this subject, though time would not admit of a thorough investigation in this respect into the records for the whole experience, a number of the cards, taken indiscriminately, were examined, but nothing of an exceptional character disclosed. Thus I was brought back to the fact that, certainly in one respect, all the members were supposed to be on a common basis—viz., total abstainers."

The next table is of great interest :—

The Number that would survive until Age	Of 1,000 persons all aged 18		
	Oddfellows, 1866-70	Foresters, 1871-75	Rechabites, 1878-87
25	957	950	962
30	922	915	938
35	884	873	914
40	840	828	888
45	791	776	856
50	764	714	815
55	636	641	760
60	584	552	687
65	483	453	590
70	370	335	461
75	245	218	306
80	134	118	165

^a Rates of Mortality of Rechabites. Neison. P. 22.

It will be seen that the survivors at all ages would be most numerous amongst the Rechabites.

The following two tables also are of interest, and show how the Rechabites have the advantage:—

Age	The number living out of whom one dies in the year		
	Oddfellows, 1866-70	Foresters, 1871-75	Rechabites, 1878-87
20	166	137	179
30	125	124	195
40	89	83	155
50	59	54	83
60	31	30	40
70	15	14	15
80	7	7	7

Age	The after-lifetime is at		
	Oddfellows, 1866-70	Foresters, 1871-75	Rechabites, 1878-87
Years	Years	Years	Years
20	41·3	40·2	45·1
30	34·0	32·9	37·3
40	26·7	25·8	29·1
50	19·9	19·1	21·2
60	13·6	13·2	14·2
70	8·5	8·3	8·5
80	5·0	4·9	4·9

Mr. Neison remarks^a:—"Thus, at age twenty, the expectation of life among the Rechabites is more by about four years than the experience of the Oddfellows and Foresters. For the reasons already alluded to, however, a better comparison would be attained by taking at age twenty, for example, the difference between the "probable lifetime" of, say, the Foresters and Rechabites. If this be done, an average increment in lifetime of no less than 5·7 years would be shown for the Rechabites."

Although figures for other periods show the advantage much more largely on the side of the Rechabites, I have preferred to give only those which have passed through the most searching tests of the actuary.

^a Op. cit. P. 39.

INSURANCE STATISTICS.

In 1840, a Quaker, named Robert Warner, wanted to insure his life; but, being a teetotaller, the company he went to wanted to charge him 10 per cent. extra on his premium. Warner thought it ought rather to be 10 per cent. less; so, getting some friends to join him, he started a Mutual Society for Abstainers only, and took out policy No. 1 for £200, and up to the end of 1886 at all events was alive.

In 1847, a section for moderate drinkers was added. This was called the "General Section," and the office has since been known as "The United Kingdom Temperance and General Provident Institution." Since 1866. careful actuarial examinations have been published. From the subjoined Table it will be seen that in the 24 years, 1866-89, 6,894 deaths were expected in the General Section, and 6,645 occurred; whilst in the Temperance Section 4,542 were expected, and only 3,198 occurred. These figures are drawn from an experience of 84,000 lives (the number of policies in force during 1885 were 29,831), and payments of policies amounting to £2,700,000, and afford the following comparison:— Out of each 100 deaths expected, 96·388 occurred in the General Section, and 70·409 in the Temperance Section. In other words, out of each 100 deaths expected, the gain in the Temperance Section, as compared with the General Section, is 25·979.

United Kingdom Temperance and General Provident Institution.

	Temperance Section		General Section	
	Expected Deaths	Actual Deaths	Expected Deaths	Actual Deaths
1866-70 .	549	411	1008	944
1871-75 .	723	511	1268	1330
1876-80 .	933	651	1485	1480
1881-85 .	1179	835	1670	1530
1886-89 .	1158	790	1463	1361
	4542	3198	6894	6645

The Sceptre Life Association made a very important contribution to the knowledge of the effects of alcohol on longevity by the publication of the Report of the valuation, made so carefully by Mr. H. W. Manly, F.I.A. This valuation was a "Pure Premium Valuation based on the Institute of Actuaries' H.M. Mortality

Table, and $3\frac{1}{2}$ per cent. rate of interest." I take the following from Mr. Manly's Report:—

"The Board has requested me to apportion the share belonging to the policy-holders between the 'General' and 'Temperance' section, according to their separate contributions to it.

"In order to arrive at a fair division on the present occasion, I have compared the actual claims in each section during the past five years with the claims that might have been expected according to the Institute of Actuaries' H.M. Table. The result is as follows, and will, no doubt, prove interesting:—

"*Mortality Experience, 1884–88.*—General Section—Expected, 466; actual, 368; percentage, 79. Temperance Section—Expected, 195; actual, 110; percentage, 56.

"Adding in 1889, the experience for the six years was:—

"General Section—Expected, 569; actual, 434; percentage, 76. Temperance Section—Expected, 249; actual, 143; percentage, 57.

"Out of the 3,338 policies issued during 1886–89, 1,928 were on the lives of total abstainers, or nearly 58 per cent.

"The actual deaths are very low in both sections. The Company explain it thus:—

"'This highly favourable result is traceable to the fact that, through the special connections of the Association, by far the largest portion of the business is obtained from persons who are members of some Christian Church, and, if not total abstainers, are very abstemious and regular in their habits.'"

The result of Mr. Manly's investigation aroused general interest. One quotation may be made:—

"Once again, the 'Temperance Section' wins. And it certainly does appear singular that, in regard to the single factor of the use or non-use of intoxicating liquor, so marked a difference should arise, and especially in an association where the great bulk of the assured belong to the religious class, and among whom, therefore, it may be presumed, if intoxicants are used at all, their use will be strictly within the limits of moderation." *

By the kindness of Mr. Bingham, I am able to give some figures which throw light upon Dr. Isambard Owens' figures. Mr. Bingham has given me the age at which insurers died during the five years covered by Mr. Manley's valuation, dividing them into the two sections. By these figures I find that the average age at death in the general section was 51.3, and in the temperance

* The Commercial World, March 15th, 1889.

section only 44·2; and yet, in the former, the mortality was 79 per cent. of the expectation, and in the latter only 56 per cent. This shows how impossible it is to argue from the ages at death without having the number of those living at each age, which was what was attempted with Dr. Isambard Owens' statistics.

The Whittington Life Assurance Company was established in 1855. Both sections pay at the same rate. In 1866 the assurers in the temperance section got 6 per cent. more bonus than the other policyholders; in 1869, nearly 7 per cent.; in 1872, 14 per cent.; whilst in 1881 it had risen to 23 per cent.; and in 1884 to 25 per cent. higher than in the other section. The next valuation is to be declared at the end of the present year.

The Marine and General Mutual Life Assurance Society took over the business of the Briton Life Association (Limited) in 1877, and continues by agreement to issue policies to total abstainers at an abatement of 10 per cent. An annual declaration as to "abstaining from the use of intoxicating beverages" is required.

The Scottish Temperance Life Assurance Company (Limited) was established seven years ago. It gives 10 per cent. reduction to total abstainers. At the annual meeting, held 7th March, 1890, it was stated by the chairman that already policies for over a million had been issued.

The Blue Ribbon Life, Accident, Mutual, and Industrial Insurance Co. (Limited) restricts its business to total abstainers. It charges lower premiums than other companies. It is also doing a large business, and its statistics will be of value.

The Lancashire and Yorkshire and the Scottish Temperance issue accident policies to total abstainers at 10 per cent. reduction. The Blue Ribbon also has an accident department. The reduction would be larger were it not that total abstainers are liable to accidents caused by the intemperance of others.

Such are the chief sources from which information can be derived bearing upon the effects of alcohol on longevity. It will be seen that the effect of alcohol in shortening life is very great when the alcohol is taken in large quantities; but it is also apparent that if a large number of people who consume alcohol in moderate quantities are compared with a number similar in other respects, but not taking alcohol at all, the longevity of the latter will be superior to that of the former. In the case of benefit societies the intemperate use of alcohol probably causes some of the higher mortality, but in insurance societies of old standing, only taking

selected lives that have passed medical examination, the great advantage in longevity enjoyed by the abstainers cannot be accounted for by any probable—I might almost say possible—incidence of intemperance in the non-abstaining branch.

That the exact effect of alcohol on longevity is not yet known is plain, but the figures and opinions I have given show that a great mass of information is gradually being accumulated. To arrive at a more certain answer it is important that further investigation should be made. The chief ways in which this may be done are:—

1. The statistics of insurance societies and benefit societies will, as time goes on, become more and more valuable as their extent and duration become enlarged.

2. Further investigation can be made into the action of alcohol in the causation of death, in the way done by Dr. Kerr, Dr. Morton, the Harveian Society, and the Collective Investigation Committee. But in future investigations medical men should not be asked to look through back certificates, but a future period of one or more years should be selected for the investigation, and medical men should be supplied with forms and asked to fill in particulars of each death as they certify it. By this means the forms would be filled whilst the case was fresh in the mind, and when needful inquiries could be made. Statistics so procured would be much more reliable than those founded on an analysis of the blocks of old certificate-books. Medical men interested in the subject would do well to commence at once noting these particulars which would then be ready for future investigations.

3. Much would be learned by investigating the effects of alcohol in causing various diseases and then seeing in the Registrar-General's returns the numbers registered as dying from these diseases. Something has been done in this way in the investigations already described here. Much more remains to be done. The great advantages of this method are that concealment of the alcoholic habit is not so easy as it is in the direct investigation, and that the field of investigation is not limited, but includes all the deaths registered in the United Kingdom.

Of the importance of the investigation nothing need be said. The evidence so far goes to prove that the deaths arising directly or indirectly from alcohol are as numerous as all other preventable deaths put together. Surely the medical profession, as sanitarians, are not only justified in doing, but are called upon to do, what they can to trace to its source and lessen this sacrifice.

