II.—*The Sanitary State of Dublin.*—By E. D. Mapother, M D., Fellow and Demonstrator, Royal College of Surgeons, and Surgeon to St. Vincent's Hospital.

[Read Wednesday, 10th February, 1864.

In this paper, for the incompleteness of which I shall at once apologize, I propose to sketch briefly, and as far as my observations have extended, the sanitary state of our city, being convinced that much disease, and many consequent deaths, are avoidable by improvements which may be very readily attained. It is very generally believed that the healths of towns, especially as evidenced by the death-rate, which may be well called the barometer of public health, must be always inferior to that of rural districts; but of late years, owing partly to an admirable system of inspection, and consequent improvements in the former, and partly to ignorance of, or inattention to sanitary matters in the latter, their conditions are becoming equalized. For instance, in the Cavendish district in London, thanks to the labours of that most efficient officer of health, Dr. R. Dundas Thomson, there now die annually but 17 out of every 1,000 living—a rate as low as such districts as that of Glendale in Northumberland and Isle of Wight, which are often held up as models of salubrity, "the standard to which every sanitary reformer now strives to raise the population of his country;" and further, the death-rate in that well-known locality, St. Giles', is but 13·6. Liverpool, of all cities in the empire, suffered most from neglect of sanitary precautions, its death-rate in 1846 being 38; but it was the first to adopt a system of sanitary inspection, and mainly through the exertions of that most successful philanthropist, the late Dr. Duncan, it was but 24, so that a saving of 4,000 lives annually has thus been effected. The causes of preventible diseases and deaths in this city chiefly are, overcrowding, deficient ventilation, imperfect sewerage, and insufficient and improper food, evils which are capable of removal, or, at least, mitigation, by a well-organized system of sanitary inspection and administration.

Another evil due to these causes is the physical degeneracy of the labouring and poor classes in the more crowded parts of Dublin, apparent to any one walking through them. The stunted proportions and listless aspects of the adults, and the pale scrofulous faces, full of precocious knowingness, of the children, contrast more widely than, perhaps, in any other country, with the stalwart build or ruddy cheeks of the surrounding rural population. Those city influences which induce an early puberty, and a consequent arrest of growth, are probably unavoidable in dense populations; but among causes of urban degeneracy which are preventible rank ill-chosen and ill-prepared food, scanty supply of cow's milk, inability for breast nursing, alcohol, impure air, &c Infants are so susceptible to unwholesome influences, that mortality among them affords a most sensitive test of the public health of any district. In 1844,

over 40 per cent. of the children of the labouring classes died under five years. Early mortality is not, however, the only ill-effect of neglect of sanitary conditions, for those who survive linger out an unhealthy life, and propagate for generations their physical defects.

As regards the proportion of persons to each room and house in the overcrowded part of Dublin, I have to borrow much from the vital statistics so admirably put together by Dr. (now Sir William) Wilde, and the investigations of Mr. Willis and Mr. Nugent Robinson. Some years ago, when professional duties frequently called me to these places, I did not note the statistical facts I observed, but I have spent much of last month in verifying the data given by those gentlemen.

The following tables indicate the density of the population and the overcrowding of some of the poorer districts of our city :—

DENSITY OF POPULATION.—*Census*, 1861.

	Population.	Houses.	Average to each house.	Acreage.	Average to each acre.
City of Dublin ..	254,808	23,001	11	3,592	71
St. Michan's	20,085	1,417	14	122	165
St. Nicholas' .. .	11,322	922	12·3	58	195

POORER DISTRICTS.

Streets and Alleys.	Houses.	Rooms.	Beds and Straw.	Inhabitants.	Average to each room.	Average to each bed.
134	2,102	11,214	14,850	40,319	3·59	2·71

Mr. Robinson mentions one considerable place, Cole-alley, off Meath-street, in which there are in 33 houses, or 171 rooms, 915 persons who sleep in 294 beds, including 170 wads of straw, or an average of 27·72 to each house, 5·35 to each room, and 3·11 to each bed or wad, and as there will be competition in the domestic circle for the former, they will be still more crowded. There are many single instances of much greater overcrowding; thus in the room in which I spent two hours last Wednesday, while testing the condition of the air, there were 13 persons, one lying ill with typhus, and four others had within three months been treated for that disease in the same room. An intelligent practitioner has informed me that he attended 5 persons in fever at the same time, and that there were 15 other persons in the same room some years ago in Cole-alley. Many instances have occurred of infants being suffocated by overlying, very often the adults being intoxicated. In the West Middlesex district, London, it is stated on the best authority, that 150 children annually lose their lives by inhaling emanations under the bed-clothes.

The forcible picture given by Mr. Rendle, Medical Officer of Health in London, is most applicable to the condition of our city

poor:—"Let us picture to ourselves the man of the alley come home from his work; the house is filthy, the look of it is dingy and repulsive, the air is close and depressive; he is thirsty, the water-butt decayed, and, lined with disgusting green vegetation, stands open nigh a drain, and foul liquids, which cannot run off, are about it, tainting it with an unwholesome and unpleasant taste, the refuse heap with decaying vegetable matter is near, and the delapidated privy and cesspool send up heavy poisonous and depressing gases." Is not the sumptuous gin-palace a tempting resource?

Mr. Willis draws the following lamentable but truthful account of the inner life of our city poor:—"In some rooms in these situations it is not an unfrequent occurrence to see above a dozen human beings crowded into a space not fifteen feet square. Within this space the food of the wretched beings, such as it is, must be prepared; within this space they must eat and drink—men, women, and children must strip, dress, and sleep. In cases of illness the calls of nature must be relieved, and, when death releases one of the inmates, the corpse must, of necessity, remain for days within the room. Let it not be supposed that I have selected some solitary spot for this description. No, I am speaking of an entire district, and state facts incontrovertible." Incalculable good has been done by the Corporation having closed over 3,000 cellars, which are now illegal if two-thirds of them lie below the level of the street.

The expediency of erecting healthful dwellings for the labouring classes has been so recently and so ably urged before this Society by Mr. Urlin, that I will confine myself to quoting the following facts in vital statistics, which illustrate the diminution in mortality such buildings can achieve. The death-rate per 1,000 among the inhabitants of the "Metropolitan Buildings" is but 7, while in London generally it was 20, and in a particularly insalubrious district, "the Potteries," Kensington," 40. Out of every 1,000 children under 10 years of age, 8, 16, and 52 die in these localities respectively.

In this, as well as in most other cities, the rooms in which large numbers of tradesmen work together are in almost every instance over-crowded and ill-ventilated, and such is the depressing influence of the foul air, that alcoholic stimulants are necessary, and intemperance among the artizan class often may be assigned to this cause. If gas be burned in them, a free supply of fresh air is especially needed, as an ordinary burner consumes five times as much oxygen as one man.

I have visited very many rooms occupied by the poor, and have measured their cubical capacity, and taking the average number of persons to each room, which Mr. Robinson deduced, namely, 3·59, each person will have a breathing space of 1,160 cubic feet. In nearly every one of these rooms the windows do not open at the top, and are almost never opened at the bottom, in many, in which they merely sleep, there are no fireplaces, several are surrounded by high walls, and in not one is there any attempt made at artificial ventilation, so that the air cannot be renewed, and is breathed over

and over again. The poor often regard the air-tightness of the windows as the perfection of house architecture, for thus the foul air of back yards is excluded, and in many instances I am really inclined to agree with them. Every crevice is carefully closed at night. In many parts of the city there are very high houses, especially in neighbourhoods which have declined, and these are extremely unwholesome, by exclusion of sunlight and free circulation of air from other houses around them. The only mode of artificial ventilation which would be practicable would be the insertion of two gratings in the outer wall of each room, such as are now usual in club houses and public offices; in every new house builders should be compelled to adopt them. Their cost could not exceed a couple of shillings.

The element in the atmosphere which above all others is believed to be most beneficial is ozone, or a highly active form of oxygen. It is regarded as a most powerful natural disinfectant, the occurrence of epidemics being even supposed to have some connexion with its absence; but from the rapidity with which it enters into combination with impurities in the air, thereby destroying them, it has been seldom or never discovered in towns. I have tested for it in the manner directed by Mr. Lowe the meteorologist, and have been much gratified by obtaining evidence of its almost constant presence and abundance in the air of Stephen's-green—the test calico being stained in an hour and a quarter, while, to produce the same effect, it took three quarters of an hour at the end of Kingstown Eastern Pier, where, of all places, ozone should be most abundant. In Peter-street, and some crowded places, it was not present.

It is stated never to have been found in the interior of inhabited houses, but when the window of my bedroom in Stephen's-green was raised, I got evidence of its presence in four hours, and in three when the test was placed outside on the window case. With the window closed, the calico slip was never stained.

The belief is gradually gaining ground that carbonic acid is not the most injurious ingredient in confined air, but that mechanically suspended particles, which can be readily seen if a ray of sunlight is let into a darkened chamber, and of which 40 per cent. is putrescible organic matter, emanations from our bodies and those of other animals and from plants are more hurtful. Infectious diseases are supposed to be propagated by such particles. The presence and amount of organic matter in the air of any place can be estimated, as discovered by Dr. Angus Smith, by causing it to pass through a measured quantity of solution of permanganate of potash of known strength, contained in Ure's bulbs, the amount of air being estimated by its displacing the water in a graduated aspirator. The greater the impurity of the air, the less of it will be required to change the colour of the solution. I have found that while it requires 3,000 cubic inches of the air of Stephen's-green to affect a given quantity of the test, 975 cubic inches of the air in a dissecting-room in which there were nine subjects, and 350 of that in a densely inhabited room in Braithwaite-street, Coombe, produce the same effect.

The noxious character of the emanations from the Liffey, especially

at low tide, when its shores are left uncovered by water, but covered with decomposing organic matter, has often attracted public attention, and the river was denounced by Lord St. Leonards in the House of Lords as "an absolute pestilence, in consequence of its being made the channel for the whole sewage of the city." I obtained on February 5th at low tide, and as nearly simultaneously as the distance would allow, some of the water of the Liffey; 1st, at the Metal-bridge, or about the centre of the city; and, 2nd, at Sir John Rogerson's-quay, when nearly all the sewage of the city had been discharged into it. For comparison, I subjoin an analysis of the water of the river at Ballysmuttan by Mr. Plunkett of the Museum of Irish Industry:—

ANALYSES OF LIFFEY WATER.

	Grains of Organic Matter per Gallon.	Inorganic.	Total Impurities.
Ballysmuttan ..	·64	2 88	3·52
Metal-bridge ..	2·33	18·64	20·97
Rogerson's-quay .	83 88	475·32	559 20

These results may give rise to many speculations. The water at the Metal-bridge is as pure as many waters used for drinking, and it may be that for want of flushing, the many large sewers, including the Poddle, which discharge above this point, throw in very little impurity. The large quantity of inorganic matter in the water at Sir John Rogerson's-quay is common salt, showing the effect of tide, which it would seem from the organic matter also throws back much refuse. Both waters were inodorous and pretty clear, and I do not think that any decomposition of organic matter can occur in so large a bulk of water. I believe that all the injurious effluvia proceed from the stuff exposed on the mud-banks at low tide, and I regard it as most desirable that as soon as the new supply renders the city basin, James's-street, unnecessary for domestic use, it should be used to flush the sewers and keep the banks covered at low tide. If the sewage water be all carried in two main streams parallel to the river, as is now being effected in London and proposed to be done for Dublin, greater exposure of the littoral surfaces must result. Into every house, or within easy reach of the poorest, the new water supply will be brought for domestic purposes, steps being taken to place the cost upon the landlord of the premises. At present it is impossible that domestic or personal cleanliness and consequent salubrity can prevail, when the poor have to carry without appropriate vessels the water from a fountain, often at considerable distances from their tenement. As is well known, the consequence is that the one quantity of water is often put through a round of washing operations, and the foul-smelling suds remains for hours polluting the air of the room. The rapid extinction of fires is another advantage of the abundant water supply we are promised; but in fact its advantages are incalculable, and our debt of gratitude is indeed great to the Water Committee of the Corporation, and especially to Sir John Gray. The two mains will diverge at Leeson-street, and after encircling the city, will reunite at its western extremity, sending off in their course numerous inter-

communicating branches. As an anatomist, this arrangement, even to its minutest details, struck me as happily based upon the perfect system of vessels for supply of the brain and other parts of our body.

The sewerage of the city was very insufficient till recent years, when, our present Engineer coming into office, they were thoroughly inspected, improved, and extended. So imperfect were the traps some years ago, that it would have been better to have had no sewerage at all, for nearly every one of them distilled their poisonous gases into the houses, being forced out by the tide from the river entering the sewers. I have seen the Poddle, our main sewer, where it opens in Ardee-street, full to the top of the arch, so that all the gases must have escaped into the air of the streets, through which it passes into the smaller drains and thence into the houses, for the current of gases almost invariably flows in that direction. If practicable, it would certainly be advantageous that the sewers should be flushed down towards the river, and the upward flow of the tide should be prevented. Some years ago, owing to the imperfections of the traps, fever was more rife where there were sewers than in neighbourhoods altogether undrained. I do not know this to be the case at present, but from many of the openings of the sewers issue most abominable smells, as I have found, especially in Back-lane and the alleys off it. There is no doubt that the time is approaching when, by a process of deodorization, the sewage will be rendered innocuous, and will be applied to fertilize the land. The attention of the most able chemists and sanitary engineers is now fixed on the subject, as the pages of the *Journal of the Society of Arts* will testify. Lime and carbon, such as our peat, are efficient and not hurtful to plant-life. The water has been the great difficulty, through its weight and bulk, which makes the cost of its carriage exceed its worth, and it has even been proposed to substitute a complete system of scavenging and immediate deodorization for sewerage, as such matters only become hurtful when putrefactive change begins. In one year 144,414 tons of ash-pit stuff were sold in Birmingham to the neighbouring farmers; but, taking into account all expenses, at a loss of £6,000 to the borough. In the Liberty and other poorer parts of this city such matters are stored up in nightmen's yards to the great detriment of the inhabitants.

As fever is the disease which affords the best indication of neglect of hygienic observances, I have obtained the number of admissions and deaths during the last ten years in the Hardwicke, Cork-street, and Meath Hospitals; but it must be remembered that the return does not show the total number of cases, as many are attended at their residences, and some are treated in the workhouse and in the Adelaide and some other hospitals.

Year.	Admissions.	Deaths.	Mortality per cent.	Proportion of cases to population
1854	4,396	385	8·75	1 in 57
1855	4,492	362	8·60	,, 56
1856	3,721	266	7·15	,, 68
1857	3,534	268	7 58	,, 72
1858	3,108	229	7·35	,, 81
1859	3,466	226	6 50	,, 73
1860	2,848	196	6 95	,, 89
1861	3,310	209	6·31	,, 77
1862	3,218	220	6·84	,, 79
1863	3,564	222	6·23	,, 71
10 years.	35,657	2,583	7·27	,, 7

In some places fever always exists, and with such virulence that 80 cases have occurred in one house in one year, 50 cases have been admitted into hospital from a second, and 15 persons have been lying ill of it at the same time in a third.

The admissions into the Hardwicke, Cork-street, and Meath Hospitals were during last month 299. The maintenances of hospitals to treat diseases, which improved hygienic measures would in most cases prevent, may well be compared to the task of Sisyphus. As proof of the striking advantages of sanitary inspection, I may mention that last year but one case of fever occurred in the 104 registered lodging houses throughout the city. On the subject of insufficient or improper food I will make no remarks on the present occasion, but I feel sure that there is no sanitary subject in which greater reform is required, and which is to be accomplished by the diffusion of plain directions for the selection and cooking of food. That the subject is attracting attention we had proof in Professor Houston's late able paper read to this Society. As evidence of the need there is for the distribution of food among the poor, I may mention that one benevolent establishment alone, the Sick Poor Institution and Nourishment Dispensary, issued, during the month ending January 11th, 1,468 quarts of broth, 226 quarts of gruel, and 496 lbs. of bread.

There is nothing in the climateric or geological condition of Dublin to render it insalubrious. Through the kindness of the Rev. Professor Haughton, M.D., I am able to present a meteorological table for the past month, showing the temperature and humidity of the air each day, as determined in the Observatory, Trinity College.

That philosopher. who has done so much for medicine and its accessory sciences, is about to publish some investigations on the two most important bearings of climate on disease—namely, the cooling and drying powers of the atmosphere upon the human body.

MAGNETICAL OBSERVATORY, TRINITY COLLEGE, DUBLIN.

1864 Jan.	Hour.	Temperature of Air.	Humidity of Air.	
1	10 a.m.	40°.9	*86	
2	,,	35·4	72	
3	—	——	—	Sunday.
4	,,	34·3	72	
5	,,	29·6	82	
6	,,	26·2	85	
7	,,	23·8	87	
8	,,	33·1	84	
9	,,	38·0	83	
10	—	——	—	Sunday
11	,,	44·4	89	
12	,,	40·5	92	
13	,,	33·7	88	
14	,,	39 0	94	
15	,,	48·0	93	
16	,,	45·4	94	
17	—	——	—	Sunday
18	,,	36·6	91	
19	,,	46·5	88	
20	,,	42·1	88	
21	,,	47·5	84	
22	,,	47·0	86	
23	,,	43·9	85	
24	—	——	—	Sunday.
25	,,	46·5	89	
26	,,	52·4	84	
27	,,	49·5	87	
28	,,	45·4	83	
29	,,	46·5	89	
30	,,	51·0	89	
31	—	——	—	Sunday.

* A state of complete saturation is represented by 100.

I have been able, through the politeness of the Registrar-General and the Registrars of Dublin, to prepare the following table of the deaths which have been recorded during the month ending January 31st, stating the ages and causes of death.

MORTALITY OF THE CITY OF DUBLIN—JANUARY, 1864.

Under 5 years.	Causes of Death.	Ages. 0 and under 20.	20 and under 40.	40 and under 60.	60 and under 80.	80 and above	Total.
	I.—ZYMOTIC.						
	Ord. 1.—Miasmatic.						
	Small Pox						
1	Measles	1					1
10	Scarlatina (scarlet fever)	12	1				13
1	Diptheria	1					2
	Quinsy						
5	Croup	5					5
6	Whooping Cough	7					7
	Typhus Fever	9	4	7	2		22
2	Erysipelas (Rose)	2			2		4
	Puerperal Fever (Metria)		6				6
	Carbuncle			1	1		2
	Pyæmia		1				1
	Influenza			4		1	5
1	Dysentery	1			2		3
3	Diarrhœa (Bowel Complaint)	4	1	1		4	10
	Cholera						
	Ague						
1	Remittent Fever	1					1
	Rheumatism			4	1		5
	Ord. 2.—Enthetic.						
2	Syphilis	2	1	1			4
	Stricture of Urethra			1			1
	Hydrophobia						
	Ord. 3.—Dietic.						
	Privation			1	1		2
	Want of Breastmilk	1					1
	Purpura and Scurvy						
	Alcoholism { Delirium Tremens / Intemperance						
	Ord. 4.—Parasitic.						
	Thrush						
	Worms, &c.						
	II.—CONSTITUTIONAL.						
	Ord. 1.—Diathetic.						
	Gout						
	Dropsy						
	Cancer		2	2	4		8
	Abscess					1	1
	Ulcer						
	Mortification						
	Noma						
	Ord. 2.—Tubercular.						
3	Scrofula	3	3				6
5	Tabes Mesenterica	5					5
2	Phthisis (Consumption)	15	37	22	2		76
5	Hydrocephalus	8					8
	III.—LOCAL.						
	Ord. 1.—Nervous System.						
1	Cephalitis	1					1
	Apoplexy		1	5	1		7
	Palsy (Paralysis)	1	4	9	2		16
	Insanity		1				1
	Tetanus						
1	Epilepsy						
32	Convulsions	32					32
2	*Brain Disease, &c.*	2	5	1	4	1	13
	Ord. 2.—Organs of Circulation.						
	Pericarditis	1					1
	Anæmia						
	Heart Disease, &c.	3	6	2	6	2	19
	Aneurism		3	1			4
	Hæmorrhage						
	Ord. 3.—Respiratory Organs.						
1	Spasm of Glottis	1					1
	Bronchocele						
	Laryngitis	1					1
27	Bronchitis	34	20	62	55	12	183
	Pleurisy	3	2				5
2	Pneumonia	3	7	2	3		15
	Asthma			1	1	1	3
1	*Lung Disease, &c.*	1	1		2	3	7
	Ord. 4.—Digestive Organs.						
1	Gastritis	1		1			2
	Enteritis	1					1
	Peritonitis		2				2
	Ascites						
	Ulceration of Intestines			1			1
	Hernia (Rupture)						
	Intussusception						
	Ileus						
1	Obstruction of Intestines	1		2			3
	Fistula						
	Stomach Disease, &c.			2	3	1	6
	Pancreas Disease, &c.						
	Painters' Colic						
1	Jaundice	1	1				2
	Liver Disease, &c	1		1	1		3
	Hepatitis						
	Spleen Disease, &c.						
	Ord 5.—Urinary Organs.						
	Nephritis						
	Ischuria						
	Nephria (Bright's Disease)		1	2	6		9
	Diabetes						
	Stone						
	Cystitis				1		1
	Kidney Disease, &c		1	1	1		3
	Ord 6.—Organs of Generation.						
	Ovarian Dropsy			1			1
	Uterus Disease, &c			1			1
	Ord 7.—Organs of Locomotion						
2	Arthritis	1					1
	Joint Disease, &c.	2					2
	Ord. 8.—Integumentary System.						
	Phlegmon						
	Ulcer						
	Skin Diseases, &c.				1		1
	IV.—DEVELOPMENTAL.						
	Ord. 1.—Diseases of Children						
8	Premature Birth	8					8
	Cyanosis						
	Spina Bifida						
5	Other Malformations	5					5
1	Teething	1					1
	Ord. 2.—Diseases of Adults.						
	Paramenia						
	Childbirth						
	Ord 3.—Diseases of Old People						
	Old Age				13	7	20
	Premature Decay						
	Ord. 4.—Diseases of Nutrition						
5	Atrophy and Debility	7		7	24	1	39
	V.—VIOLENT DEATHS						
	Ord 1.—Accidents or Negligence.						
	Fractures and Contusions			1			1
2	Burns and Scalds	2					2
1	Drowning	1			1		2
1	Suffocation	1					1
	Poison						
	Otherwise						
	Ord. 3.—Homicide.						
	Murder and Manslaughter						
	Ord. 4.—Suicide.						
	Wounds						
	Poison						
	Drowning						
	Hanging						
	Otherwise		1				1
	Not Specified or Ill-defined	5	1	2	1	1	10
144	Total	201	114	154	142	38	649

The burials in the three city cemeteries were 896 in the same period, which shows that despite the utmost efforts of the Registrars many deaths have not been noticed to them.

Although without a registration of deaths no exact statements as to the mortality of Dublin could be given, the opinion has prevailed that it is greater than it should be, considering the absence of many prejudicial branches of manufacture or employment. In the writings of great medical authorities of former days we find that opinion expressed. Short (1750) asserts "that sickly years are more fatal in Dublin than in London." Rutty (1772) remarks "that those who know the situation of the poor here can be at no great loss to account for the frequency and mortality especially of fevers, several families being in one room, which must undoubtedly contribute not only to the propagation but also to the malignity of these diseases;" and Hawkins states that "Dublin appears to have suffered more continually from epidemic fever than any other great city in Europe." When famine is added to such other predisposing causes, as overcrowding or impure air, the mortality through typhus and small-pox becomes truly appalling. For three years ending 1841, the death-rate was calculated as 30 per 1000 in the city and 17 in the surrounding country, but the means of ascertaining the facts were very imperfect.

To show the status of disease in Dublin and the amount of it which is preventible, I may appeal to the census of 1861, by which it appears that in a population of 254,293, out of the 5,646 "persons who laboured under temporary or permanent disease on the night of the 7th April, 1861," 1,763, or over one third, were ill of diseases which were plainly avoidable, or to be much diminished by attention to sanitary conditions, such as fevers and other zymotic diseases, scrofula, consumption, dyspepsia, rheumatism, debility, &c.

Mr. Willis calculated that, out of 100 children of the labouring classes born in Dublin, but 34 live to be 20, 20 to be 40, and only 14 to be 50. Applying these proportions to the male population of the city, it follows that about 20,000 men will die between the ages of 20 and 40, and 10,000 between 40 and 50. Most of these leave widows and orphans, who usually become objects of poor-law relief. These premature deaths cannot be attributed to want of provision of curative medicine, for no city in the empire is more fully supplied with skilful and efficient physicians for the poor; but are, in a great majority of instances, due to ignorance of, or inattention to, preventive medicine. Overcrowding, impure air, insufficient water and sewerage, debility, pauperism, contagious scourges, death, widowhood, orphanage, and excessive taxation are in this city sequential terms.

To demonstrate the national loss and depreciation of industrial and commercial prosperity which we suffer from the high death-rate among the young of our population, I cannot do better than quote the concluding remarks of a paper read by Mr. Wm. Hogan before your society just fifteen years ago:—"Assuming that the English youth under 20 were all as unproductive as the Irish (which every one knows they are not), we have in Ireland an excess over England of 13 per cent. who are not of an age to be productive labourers,

and 13 per cent. less of those who are, making a difference of 26 per cent. in favour of the productive labour of England, *owing to the longer lives of the people.* The advantage in favour of English means of labour is, of course, very much increased, in consequence of the earlier age at which the generality of the population become productive labourers, and the much greater value of the labours of those who are capable of productive employment; but in both countries *early death impoverishes the nation,* and an increase in wealth must ultimately depend on the long and healthy lives of the labouring classes, and that again on their good social and sanitary condition."

It cannot be doubted that the city of Dublin is in a fearful sanitary state, that preventible disease and death most largely occur, and the sacrifice of life would be most enormous if some such epidemic as cholera or small-pox should invade us. The remedy required is an efficient system of health-inspection, which every city in the united kingdom of equal size to Dublin now enjoys. London is divided into 48 districts which are inspected each by a medical officer of health, and when we find names in the list so well known to medical and scientific literature as Dundas, Thomson, Letheby, Lankester, Pavy, Druitt, Holt, &c., the importance of the office and the manner in which its duties are fulfilled may be judged of. I will first sketch the duties they are expected to perform, and then give an example of the work done in one district in one year. The following is a list of the chief acts of parliament by which their duties are defined:—Nuisances Removal Acts, 1845, 48, 49; Baths and Washhouses Act, 1846-7; the Public Health Act, 1848; Common Lodging House Acts, 1851-3; Nuisances Removal and Diseases Prevention Act, 1855; Metropolis Local Management Act, 1855, &c. The last mentioned act declares the duties of the medical officer of health to be, "to inspect and report periodically on the sanitary condition of the parish, to ascertain the existence of diseases, more especially epidemics increasing the rate of mortality, and to point out the existence of any nuisance or other local causes which are likely to originate and maintain such diseases, and injuriously affect the health of the inhabitants; and to take cognizance of the existence of any contagious or epidemic diseases; and to point out the most efficacious mode of checking or preventing the spread of such diseases; also to point out the most efficient modes for the ventilation of churches, chapels, schools, lodging-houses, and other public edifices within the parish or district, and to perform any other duties of a like nature which may be required of him."

Inspection of drainage, water-supply, including its chemical and microscopical examination, appliances for the removal of necessary refuse, and the mitigation or suppression of hurtful employments or manufactories, are also intrusted to him. As an example of the practical improvements which are worked in the means of health by these officers, I select the district of Marylebone, as perhaps a fair average in regard to the number, density, and other circumstances of the population. Dr. R. D. Thomson, F.R.S., the medical officer, in his annual report for 1862 records the deaths to have been 3,771, the births 5,140, in a population of 161,680. Among the deaths

were 165 from scarlatina and 115 from whooping-cough, both of which he shows to be endemic and communicable from person to person, and he demonstrates that many of the cases are preventible. Upon other diseases he makes most valuable observations. He exhibits the mortality and sickness in each part of the district, so that when the exact locality of an evil is determined, means may be taken to remove or lessen it. Within the year he made analyses of the waters from 25 pumps through the streets in his district, and showed their unfitness for drinking. He inspected the construction and improvement of 9,716 feet of street sewerage, and "in prosecution of improved drainage and other sanitary works, 1,913 houses have been inspected, and 169 inhabited stables; 238 cesspools have been abolished; 12,137 feet of new pipe drains have been laid down in inhabited premises; 654 drains have been repaired; 1,336 traps have been adapted to drains; 11 new closets have been constructed; 537 closets have been supplied with water; 65 new water receptacles have been established for the supply of water; 57 water receptacles previously sunk in the ground and subject to be rendered impure by soakage and by insects have been placed above ground, where they can be inspected and readily cleansed; water has been laid on to 21 houses; 67 houses have been wholly, and 130 partly cleansed; 3 houses have been ventilated; 822 yards and areas cleansed and lime-washed; 290 paved or repaired; 24 new dust-bins built, and 1,116 houses improved." Dr. Thomson's report is also immensely valuable as containing tables according to the Registrar-General's classification of all the deaths which occurred in the whole parish and in each of its 6 subdivisions, and of the cases of disease within the year in the 11 charitable institutions in the district.

The sagacity of the legislature and the zeal of Dr. Thomson and the local authorities seem to have been rewarded, for the death-rate of the whole district is but 23 per 1,000, and of one of its subdivisions but 15·75, or $1\frac{1}{4}$ lower than that of such country districts as Glendale in Northumberland and Isle of Wight.

About the year 1842 one-third of the labouring and poorer population of Liverpool were living in cellars ten or twelve feet square, sometimes less than six feet high, often without windows, and these only lighted and ventilated by the door, the top of which was often not higher than the level of the street, and upon this door a back cellar, dark and damp, depended alone for its supply of air. Low lodging-houses abounded in Liverpool more than any city in the kingdom; but, owing to the exertions of Dr. Duncan and his most able successor, Dr. Trench, they have been properly conducted of late years.

Provincial towns, for instance Clonmel, through the exertions of Mr. W. L. Hackett during his two years of mayoralty, are in advance of our city in respect of sanitary inspection and improvement, including gratuitous baths and the free cleansing and lime-whiting of premises. Waterford also owes to its active representative and former mayor, Mr. Blake, such healthful measures as the levelling of several dilapidated and overcrowded streets, and the establishment of a public park.

It has been for many years apparent to me that we possess in this city, perhaps more readily than in any other, the machinery for carrying out an efficient system of health-inspection. There are seven poor-law dispensary stations within the municipal boundary, each of which has two medical officers and a resident apothecary; and although I do not hint for a moment that they are under-worked, yet the attendance of patients at the dispensary stations is very much diminished by the thirteen dispensaries attached to hospitals or ophthalmic institutions, where the poor anxiously apply for medical relief as well as admission. Their most important duty is therefore the attendance of the sick poor at their own homes, and of the scientific knowledge, skill, patience, and practical benevolence of nearly every one of these gentlemen I can speak from personal knowledge; danger is disregarded, sights the most shocking are endured, while in fulfilling their invaluable duties from house to house they do incalculable good.

That they have had time for additional occupation is shown by their universal acceptance of the offices of vaccinator and registrar of births, deaths, and marriages, which the legislature has most wisely entrusted to them. The office of inspector of health would add but little to their engagements, as nearly all its duties could be performed as they visited the sick professionally from house to house. In proportion to the size and population of Dublin, seven officers of health would be sufficient, as a greater multiplication of authorities and reports would be disadvantageous; so that the appointments should be arranged as the registrarships at present are—namely, the senior of the two dispensary officers to be officer of health, and the junior his assistant; or the office should be offered to the senior, and, if he refused it, conferred on the junior. His remuneration should be in the form of a moderate annual salary, proportioned to the amount of population in his district. The combination of the offices of medical attendant of the poor, registrar of deaths, and officer of health, would enable him to direct his attention to any locality where disease, especially of a preventible nature, arose, or where deaths, above the average from any particular cause, occurred, and would lead to well-directed sanitary improvements. The constables of the metropolitan police would form intelligent and reliable assistants to the medical officer of health. I am aware that a few sanitary duties are already performed by these men, but they cannot be expected to be well-directed or grounded on scientific information, and they are not efficient. The officers of health appointed at the Easter vestries have occasionally done good through an inspector, but in the largest parish in the city the funds for his payment were last year appropriated to some other purpose. The corporation are empowered under the Nuisances' Removal and Diseases' Prevention Act to appoint a medical officer, but I contend that in this way the duties could not be efficiently performed, unless there were funds available to secure the entire services of a physician of the highest scientific attainments, who should be recompensed by an adequate salary for the sacrifice of all other engagements. This will be appa-

rent when the subjects which should engage the attention of medical officers of health according to the acts of parliament are considered. They are briefly:—Ventilation and warming of buildings, workshops, or houses; water supply, including its chemical and microscopical examination; sewerage and appliances for removal of refuse; inspection of mews, cow-houses, slaughter-houses, and knackers' yards; the technical supervision of manufactures and certain employments with a view of suppressing or mitigating the evils arising from them; prevention of zymotic diseases and the preparation of a monthly and annual report setting forth the hygienic conditions, diseases, and mortality of each subdivision of his district. I will allude to one more method of diffusing sanitary knowledge, and thereby producing much improvement—namely, the teachings and admonitions of ladies who visit the homes of the poor. The Ladies' Sanitary Association affiliated with the National Association for the Promotion of Social Science, with the Hon. Mrs. W. F. Cowper as its president, and Mrs. Sutherland as its secretary, has done incalculable service in London and elsewhere, by the circulation of its admirable tracts, produced by an editing committee, consisting of Drs. William Farr, Grainger, Marshall, Richardson, Sieveking, and Sutherland—the most eminent of all sanitary reformers. I have laid on the table some of the publications and the last report of the society. It is not generally known that this useful society has established a branch in Dublin, "The Ladies' Sanitary and Industrial Society," which will be soon, I believe, amalgamated with another body with similar objects, instituted at the suggestion of some leading members of the Social Science Association when it met in Dublinin 1861. Useful information in sanitary and industrial matters has been diffused by these societies, which are most completely unsectarian.

Discussion.

Dr. Hancock said that in 1848 and 1849 acts of parliament had been passed regulating public health. So far as England and Scotland were concerned, these were repealed, having been found unsuitable, and new acts had been passed in 1855 or 1856, under which sanitary regulations could be enforced. But Ireland still remained under the old acts.

Mr. Urlin had heard that there was some difference in the rate of mortality in the Dublin hospitals.

Mr. O'Shaughnessy said it was to be regretted that steps had not been taken to make the sanitary code relating to Ireland suitable to the machinery of the local public bodies. The Nuisances' Removal and Diseases' Prevention Acts were practically inoperative in this country; and whatever was done for the benefit of the public health was, he believed, principally under the authority of the Towns' Improvement Act and the local corporate Acts.

Rev. W. Jeremy detailed the good done by the Dublin Ladies' Sanitary Association. Much of this had resulted from personal visits to the poor in their own dwellings.

MR. SHANNON thought the responsibility rested with the corporation to correct what Dr. Mapother had described.

DR. MAPOTHER said that he was not aware that there was any remarkable difference as to the death rate in the Dublin hospitals. If any existed it would, he thought, be found, and not unreasonably, to be against those in the most crowded parts of the city.

III.—*The Debt and Taxation of Ireland.* By Joseph J. Murphy, Esq.

[Read Wednesday, 16th March, 1864.]

MY attention has been directed to the "Report of the Special Committee of the Municipal Council of Dublin on the state of the Public Accounts between Ireland and Great Britain," and I design to lay before you the results of a careful examination to which I have subjected that Report. I take all the figures there stated as correct; but I believe I can show that they do not support the inference which the Committee have drawn from them.

The first statement is, that the financial arrangement at the Union was not just towards our country. That arrangement was that each country should pay the interest on its own debt, as those debts stood at the time of the Union; and that the joint expenditure of the Empire, including the interest of loans contracted after the Union, should be charged to Great Britain and to Ireland in the proportion of 15 to the former and 2 to the latter. This proportion was fixed on as the nearest attainable approximation to the relative means of the two countries. I do not know whether data are now to be found for ascertaining if that proportion was really fair. At present the wealth of Ireland no doubt bears a smaller proportion to that of Great Britain, but Great Britain since the time of the Union has certainly increased in wealth more rapidly than Ireland. The Committee maintain that the means of this country were overrated by the arrangement at the Union; but their chief argument in support of that conclusion is, that we never did pay so large a proportion, and they omit any mention of the fact that our rates of taxation were much lower. They say:—"Taxes were increased and multiplied until the country broke down under their weight, and each new imposition produced not an increase but a diminution of the revenue. No cause, therefore, except inability can be assigned for the alleged failure of Ireland to furnish the quota of the joint expenditure allotted to her; and to say that she was unable to bear the burden is to say that it should not have been imposed upon her." The force of the word "alleged" in the foregoing extract is not very obvious, for it is stated, only a few lines above, that we never paid more than a tenth of the imperial expenditure, instead of the two-seventeenths that the Act of Union required us to pay; but perhaps they mean to reserve the liberty, in some future edition, of endorsing Mr.