

I have carried to perfection the grisoumètre of Coquillion, and I had an instrument constructed by Golaz, which is so exact and sensitive, that in an atmosphere containing only $\frac{1}{100}$ part of fire-damp, the record on the instrument is equal to ten divisions; and $\frac{1}{1000}$ part of fire-damp can be detected by a record equal to one division.

The same instrument may be used for estimating carbon monoxide, and I often use it in my researches. I will presently show you this instrument in action, in another amphitheatre which is supplied with electricity, gas, and water.

Before concluding and giving place to Prof. Corfield, the President of this meeting of the Sanitary Institute, I will have thrown upon the screen the portraits of the honoured savants who have preceded us in this work. Among these you will recognise some of your own countrymen, all great men, whom we are happy to remember gratefully, because they have opened up new horizons, so to speak, unlimited horizons for the benefit of mankind. It is in the Congresses, brought about by our brilliant Universal Exhibition of 1900, that the scientific men and the workers of all countries learn to know and to esteem each other, and to lay the foundation for the re-establishment and maintenance of universal peace.

ADDRESS

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(VICE-PRESIDENT OF THE INSTITUTE.)

PRESIDENT OF THE MEETING.

IN the first place it is my duty to thank you, Sir (Professor Gréhan), as President of the Société Française d'Hygiène, and through you that Society, for inviting the Sanitary Institute to hold a Conference this year in Paris in connection with your Society, and to thank you personally for your cordial address of welcome.

It having been decided, for various reasons, not to hold a Congress of the Sanitary Institute this year in England, the Council had the greatest pleasure in accepting your kind invitation, especially as the meeting could be arranged to take place immediately before that of the Tenth International Congress of Hygiene and Demography.

I think that nothing more appropriate or of happier omen could happen in connection with the two Societies, and I hope it is only the beginning of more continuous and intimate relations between them.

I consider that cordial intercourse between scientific men of various countries is a most important, and will in future times be a still more important factor in forming cordial relations between different countries. The interchange of visits between the French and the British Associations for the Advancement of Science last year was a most happy beginning in this direction, and I am glad to think that we are following it so soon, and I hope that the Sanitary Institute will soon welcome the Société Française d'Hygiène in London.

It was with great pleasure that I acceded to the wish of the Council of the Sanitary Institute that I should be the English President on this occasion, and I may be permitted to think that there is some appropriateness in the choice of the Council. My study of Hygiene began in Paris in 1868, when I attended the lectures on Hygiene given by Bouchardat, and worked at Hygienic Chemistry in the Laboratory at the Collège de France under Berthelot. It was while I was working in Paris that I was elected at University College to the first Chair of Hygiene established in London, and dear old Bouchardat used to address me as "le jeune Professeur," while we students affectionately called him "le père Bouchardat." I was very much impressed by his teaching, and I feel that his lectures have an influence on my own even at the present time. He has gone from us, but I am happy to know that my old master, Prof. Berthelot, is still with us.

But to return to my subject.

Many of you know the Sanitary Institute by name, and perhaps some of you know something of its work; but it has been thought well that I should on this occasion draw your attention to the history and working of this by far the most important Sanitary body in the United Kingdom.

Attention was prominently called to the importance of sanitation in England in 1844 by the Reports of the General Board of Health, of whom Mr. (afterwards Sir Edwin) Chadwick was the guiding spirit; but sanitary work in London may be said to have commenced in earnest in 1855, when the Nuisances

Removal and Diseases Prevention Acts were consolidated and amended, and when the Metropolis Local Management Act, which required the appointment of Medical Officers of Health and Inspectors of Nuisances in London, was passed. Under that Act those officers were appointed by the Sanitary Authorities in London, and under that Act I am proud to say that I have been a Medical Officer of Health for nearly twenty-nine years.

From 1855 to the present time, medical officers of health and inspectors of nuisances, now more properly called sanitary inspectors, have been at work all over London searching out the causes of diseases and preventing them, abating nuisances of all kinds, and educating the public, with a result which I will explain later.

In 1866 the Sanitary Act was passed, but although some good was done by it, it did not provide for the appointment of medical officers of health and sanitary inspectors throughout the country. This defect was remedied by the Public Health Act of 1875, which required local authorities all over the country to appoint such officers.

The effect of this has been most beneficial, and I will refer to it later on, and also to the effect which has been produced in the health of London by the carrying out of the Public Health (London) Act, 1891.

It was in consequence of the Public Health Act of 1875, that The Sanitary Institute was founded in 1876, and one of its first acts was to originate an examination for persons who wished to become Sanitary Inspectors. These examinations it has continued ever since, and in doing so has performed a great work for many years, and one which alone would entitle it to the gratitude of all who are interested in sanitary work! And who are not? for "*Salus populi suprema lex.*" From 1877 to 1889 no less than 5,401 candidates were examined, and 3,073 of them obtained certificates.

The Parkes Museum of Hygiene was also founded in 1876, in memory of Professor Edmund Parkes, the great English hygienist, and was incorporated with the Sanitary Institute in 1888; these two Societies had been working together for five years previously, but since that date have been one institution, the Parkes Museum having become in fact the museum of the Sanitary Institute. Our Patron is H.R.H. The Duchess of Albany; the past Presidents of the Parkes Museum and of The Sanitary Institute have been H.R.H. Duke of Albany, the Duke of Northumberland, and the Duke of Westminster; and our present President is H.R.H. Duke of Cambridge.

Besides the examinations for Sanitary Inspectors, which are

now carried out by a conjoint board formed of representatives of various sanitary societies in London, the Sanitary Institute also originated examinations in practical sanitary science and examinations for inspectors of meat. It has also instituted a system of training for these various officers consisting of lectures of which forty-eight were delivered last year, with a total attendance of 2304 students, and practical demonstrations for sanitary officers and meat inspectors. No less than ninety-seven classes, with a total of 2154 students, were brought to the Museum last year, while the number of other persons visiting the Museum is estimated at 7,500. These examinations are not only held in London, but at various provincial centres, and the Council has recently arranged for an examination to be held in Sydney, N.S.W., and negotiations are in progress for another to be held in Canada.

It would occupy your time too much for me to explain the work that has been done by the Sanitary Institute more in detail. Suffice it to say that in addition to the training and examination of inspectors and others, the interest of the public in hygiene has been aroused by annual congresses held in various cities and towns in the United Kingdom, and by meetings held in London for the discussion of important sanitary matters.

This leads me to add that at the invitation of the Sanitary Institute, in which invitation the Society of Medical Officers of Health joined, the International Congress of Hygiene and Demography was held in London in 1891. That as recently as last week the Institute held a conference in London on the housing of the working classes, a subject of the highest importance to all large communities, and that next year a very important congress on the question of the prevention of Tuberculosis is to be held in London.

The total number of members of the Institute has increased from about 530 in 1888 to 2324 in 1899. Among these there is a class of Honorary Fellows, men of the highest distinction in sanitary work in all countries. There are now thirty-five Fellows in this class, and I have the greatest pleasure in informing you that Professor Gréhan has been duly proposed as an Honorary Fellow.

The good that has been done by the various agencies I have mentioned is seen in the marked diminution of the general death-rates in the latter half of this century, not only in London but also throughout England and Wales. Thus for instance as shown in Table I, the death-rate in London from 1851 to 1870 averaged 24.1 per thousand, from 1871 to 1890 it had gone down to 22.5, from 1891 to 1895 it averaged 22.2,

and from 1896 to 1899 it actually went down to an average of 18·8.

I may be allowed here to refer for a moment more particularly to the district of London for which I have been medical officer of health for twenty-eight years. This is in the west-end of London and has a population of rather more than 80,000. The death-rate of this district during the last four years has averaged only 13·67, or if corrected for age and sex distribution only 15·13 per thousand per annum. This I take it is a very remarkable result for a population of over 80,000 persons in the middle of a city which, including the near suburbs (Greater London), has a population of over six and a half millions.

TABLE I.—LONDON.

Years.					Average death-rate per 1000 per annum.
1851 to 1870	...	...	...	...	24·1
Nuisances Removal Act, 1855.					
Sanitary Act, 1866.					
1870 to 1890	...	...	...	...	22·5
Public Health (London) Act, 1891.					
1891 to 1895	...	...	...	...	20·2
1896 „ 1899	...	...	...	...	18·8

TABLE II.—ENGLAND AND WALES.

Years.					Average death-rate per 1000 per annum.
1849 to 1875	...	...	...	...	22·4
Public Health Act passed in 1875.					
1876 to 1880	...	...	...	...	20·8
1881 „ 1885	...	...	...	...	19·4
1886 „ 1890	...	...	...	...	18·9
1891 „ 1895	...	...	...	...	18·7
1896 „ 1898	...	...	...	...	17·4

In England and Wales the death-rate for some years before 1875, when the Public Health Act was passed, was 22 per 1000. It has gradually gone down until from 1896 to 1898 it was only 17·4 per 1000 (see Table II.).

The Registrar-General calculates that the total saving of life in the decade 1881–90 over that of 1871–80 is equal to 2,192 lives annually per 1,000,000 of the English population, and of course the life saving in 1881–90 over that of 1861–70 is far greater still.

But I must now refer to a special Act which has been productive of the most beneficial results. I refer to the Act

for the Notification of Infectious Diseases, passed in 1889. For some years before the passing of this Act the notification of certain infectious diseases had been compulsory in some towns, and in 1883 I prepared, at the request of the Council of the Sanitary Institute, a report on the working of the Local Acts in those towns. The result of my investigations convinced me that the compulsory notification of infectious diseases "is a very important sanitary measure and a great boon to the community to whom it has been applied," and the successful results obtained in the towns which had adopted such a measure brought about the passing of the general Act in 1889.

This Act extended to every sanitary district in London, and to any Urban, Rural, or Port Sanitary District which chose to adopt it. At first there was some opposition on behalf of a portion of the medical profession, who held the view that it would be a breach of professional confidence for them to certify to the public authority the fact that their patients were suffering from infectious disease, and it was no doubt to a great extent owing to this opposition that the system of dual notification under which not only is "every medical practitioner attending on or called in to visit the patient" compelled under penalties to certify the fact of infectious illness to the medical officer of health, but also the head of the family is required to notify it.

I have always been opposed to dual notification, and have maintained that all that was necessary was that the medical man should certify the fact of infectious illness to the medical officer of health, and the working of the Act has shown that such is the case.

As a matter of fact, none of the disadvantages which were foretold have been experienced. The Act works perfectly smoothly, medical men loyally carry it out, and the difficulty which it was anticipated would arise between them and their patients has proved to be a myth. At the same time the futility of dual notification has been made manifest by the fact that the sub-section of the Act requiring householders to notify the fact of infectious disease in their houses to the medical officer of health is to all intents and purposes a dead letter.

This Act has, I am satisfied, been productive of great benefit and assisted materially in the great diminution of the death-rate from certain of the infectious diseases in England and Wales. Thus on glancing at Table III. we see that the death-rate from Scarlet Fever, which was reduced by general sanitary measures from 972 per million persons living in 1861-70, to 716 in 1871-80, was still further reduced to 334 in 1881-90, to 182 in 1891-

95, and to 146 in 1896-98, and that the numbers for continued fevers (chiefly Enteric Fever) were 885, 482, 235, 185 and 174 per annum during the same periods. With such results it is not to be wondered at that the whole country has now been put under the operation of the Act. I have put in the same table the notable reductions that have taken place from general sanitary improvements in diarrhœa and Phthisis, although neither of these are notifiable diseases. (The increased average death-rate from diarrhœa in 1890-98 was due to the excessive heat during the summer of 1897 and 1898.) It will be noticed that the greatest reduction of all has taken place in continued fevers (chiefly Enteric) where the death-rate has been reduced to less than a fifth of what it was in 1861-70 (a most remarkable result), and this is to be expected, as the influence of sanitary improvements can be brought to bear upon them, perhaps, more directly than upon any other disease.

TABLE III.—ENGLAND AND WALES.

Annual Death-rates per million persons living.

		1861-70.	1871-80.	1881-90.	1891-95.	1896-98.
Scarlet Fever	...	972	716	334	182	146
Continued Fevers } (chiefly Enteric) }		885	482	235	185	174
Diarrhœa	...	1076	935	674	630	769
Phthisis	...	2475	2116	1724	1464	1321

M. A. JOLTRAIN, General Secretary of the French Society of Hygiene, congratulated Prof. Corfield on his interesting address. The figures which he had given as to the regular decrease of mortality in London were evidently interesting; but what struck him most in the statistics was the decrease of deaths from phthisis. For many years past hygienists had recognised that tuberculosis had made most distressing progress in all European countries, and a campaign had been entered upon to try and arrest the march of this fatal disease. Now Prof. Corfield had just shown that the decrease of mortality from phthisis had been from 2,475 to 1,321 during the last forty years. It seemed then that Great Britain furnished the only exception to the general rule. The popularising and the rigorous application of hygienic principles had evidently contributed to these happy results, but in other countries of Europe the principles were popularised and also rigorously applied, and still the ravages of tuberculosis grew greater.

M. Joltrain therefore asked Prof. Corfield to what other causes he could attribute this remarkable exception in favour of Great Britain.

Prof. CORFIELD replied that, in his opinion, the great decrease in the mortality from phthisis was due to many causes: 1, notably to the lowering of the subsoil waters in towns caused by drainage operations; 2, to the clearing of unhealthy areas by the demolition of old insanitary houses; 3, to the prevention of overcrowding; 4, to the construction of new houses with improved sanitary arrangements, and to the widening of streets.

After this important communication, M. le Prof. Gréhant showed a series of portraits of the savants of the century.

The last portrait, that of Dr. Pietra Santa, founder of the French Society of Hygiene, was received with applause, and all present rendered homage to the memory of him who was in France one of the first to popularise the science of hygiene.

The members of the Congress then adjourned to the amphitheatre of comparative anatomy, where M. le Prof. Gréhant, assisted by M. Nicloux, showed an interesting series of experiments on the estimation of alcohol, and of carbon monoxide in the blood, and of fire-damp in mines. This was the first of the great discoveries made during the last few years by the eminent Professor of the Museum and his distinguished colleague.

M. Nicloux showed in a satisfactory manner that, according to recent observations founded on the researches of his master, it was established as an absolute certainty that all the alcohol imbibed by the mother was found in her milk and in the blood of the fœtus.

M. Gréhant explained in a few words how, after patient research and numerous experiments made in his physiological laboratory at the Museum, he had been able, with Felix Le Blanc and Claude Bernard, to make good progress in toxicology in measuring the quantity of carbon monoxide that was found in the blood of an animal which had breathed a mixture of air and this very poisonous gas from a proportion of 1 in 1000 to 1 in 10,000.

He showed also the marvellous success he had attained in bringing to perfection the grisoumètre of Coquillion, thanks to the exactness and sensitiveness of which there could be discovered in an atmosphere containing only $\frac{1}{100}$ part of fire-damp a variation of $\frac{1}{1000}$ part of this gas by a record equal to one division.