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I.—*Address by the Vice-President, SIR ROBERT KANE, at the opening of the Twentieth Session.*

[Read Tuesday, 27th November, 1866.]

WHEN acceding to the request of the Council of the Statistical Society to open this session by delivering the Annual Address, I did not conceal from myself the difficulties which that task presented to me. I was quite aware that the subjects with which the Society has hitherto been principally occupied, have only an indirect relation to the branches of science with which I have been more specially engaged, and that I could not presume either to comment upon the proceedings of the Society, or to indicate the path which our members should pursue during the coming session, with that authority which attached to the opinions of the eminent persons who in the late years have occupied the position which I now have the honor to fill. The gradual development and extension of the objects of this Society has, however, recently brought within its scope subjects of statistical and economic inquiry, of not less scientific interest than any included within our earlier limits, and certainly of not less practical importance to the well-being of the people. Having commenced originally with the object of collecting, arranging, and discussing purely statistical facts, and avoiding the thorny questions of economic science, which was then scarcely considered separable from party politics, it has been only by degrees that the principles of political economy were admitted to the position of scientific truths, even so far as regarded the laws of population, of capital, and of commercial interchange. It has required still longer time and still further discussion before it was allowed, that the distribution of wealth as well as its creation, that the

condition of a population as well as the laws of its diminution and increase, could be considered upon purely scientific grounds, and could be extricated from the mire of political discussion. Even that advance has been, however, made; and in the expanded objects of statistical and economic science, the relations of capital to labour, of rich to poor, of the governing to the governed, can be impartially examined from the one as well as from the other point of view; and thus, animating and directing the agencies of an enlightened philanthropy, may help to realize as a scientific law the noble sentiment of Bentham, that the true aim and object of society should be the greatest happiness of the greatest number of the people.

This remarkable development in the nature and objects of economic science has been fully represented in the proceedings of our Society for some time back, and our transactions will be found to contain many interesting papers suggesting or recording matters of social amelioration. A remarkable result of this new tendency of economic inquiry has been the establishment of the Social Science Congress, of which a very successful meeting took place in this city a few years back, and which in turn has given a still further expansion to the objects of this Society, which now embraces within its scope not merely Statistics and Political Economy, according to the older definition of those sciences, but includes also what is now understood by the name of the Social Sciences; in fact admitting as proper material for its labours almost every question affecting the material interests of society, the security of property, the health and education of the people—all, of course, treated upon purely scientific grounds, and independently of every personal or political consideration.

The scope of our Society has thus been extended far beyond its ancient bounds, and has necessitated a formal subdivision, which, although not strictly carried out, is yet as far as possible observed in arranging for the business of our meetings. Our objects are now declared to be the promotion of the study of Statistics, Jurisprudence, and Social and Economic Science, and those objects are arranged in three departments, to wit:—

- 1st. Jurisprudence and the Amendment of the Law, including the Punishment and Reformation of Criminals.
- 2nd. Social Science including Education, and Political Economy including the principles of trade and commerce.
- 3rd. Public Health and Sanitary Reform.

We have had, at our last anniversary meeting, the condition and prospects of the first of those three classes of subjects most ably and most eloquently discussed by Mr. Justice O'Hagan, who then occupied this chair. On the preceding anniversary, that second class of our objects which occupies itself with the more material interests of social life, was considered in relation to that question of such paramount gravity in this country—the tenure of land—by Judge Longfield, the person above all others the best qualified by position and experience to express an authoritative opinion on that difficult subject. It has therefore appeared to me most

beneficial, as well as most simple, that your attention should be called on this occasion to the third branch of our objects, to wit, that of Public Health, a subject which although but of recent introduction, is now recognised as of vast importance to the individual as well as to the state, and in regard to which, the nature of my own pursuits, having had some practical connexion with many of the subjects which it includes, I may feel myself enabled to appreciate more accurately what the Society has accomplished within that field, and to indicate with more confidence the direction in which, as I believe, the labours of our members may be most usefully directed.

The importance of enquiries into the sanitary condition of the people, and the necessity for provisions being made on the part of the state for the preservation of the public health, has until lately been recognised only on occasions of the threatened invasion of some plague or other violent epidemic, and the preventive measures which the science or rather the ignorance of the times could devise, consisted in an elaborately futile system of quarantine, and a form of destroying the contagious matter by fumigations, which had more resemblance to the magical ceremonies of an Eastern tale than to any real or scientific action. The true conditions upon which the maintenance of health depends, whether of individuals or of masses, were but very imperfectly known even to the best informed, and not at all to the common people. and it is a lamentable fact that the education still given even to the highest classes in our public schools and colleges, leaves the pupils but too often ignorant of the most elementary principles of physiological and chemical science; whilst the most valuable years of life are occupied with the minute details of Greek and Latin versification, a subject which to the great body of the learners can be but of very inferior importance. Within the last few years the necessity for a proper knowledge of sanitary laws, and the observance of sanitary conditions in the life of the people, has been recognised by the governing classes, and it is now generally understood that violent epidemics, such as that from which we are not as yet quite free, although creating great alarm and attracting universal attention by their rapidly destructive effects, yet, like the transitory though violent disturbances of our atmosphere, exercise but a subordinate influence on the real value of human life, or the true conditions of human happiness, as compared with the silent but continuous action of those preventible sources of disease which are every where and at all times in operation, and by which a much larger number of lives, that might have been saved to their families and to the state, are lost by ignorance and inertness. Under this stimulus, however, considerable progress has of late years been made in every department of Sanitary Science, and various legislative provisions have been devised to meet the more positive and prominent necessities of society. This increased attention to the subject has mainly sprung from those epidemics affecting both man and the lower animals, which have within the last few years assumed such national importance. This cause will, as I hope, prove temporary; the good

effect will, as we may trust, be permanent, and will be the origin of improved social arrangements better calculated to maintain the true conditions of health among the people.

The basis of all questions concerning the public health must be the rate of progress of the population, its increase in number, and the average value or duration of life. In regard to our population there is no doubt but that it continues to show a decided diminution, as the tide of emigration which still pours from our shores more than counterbalances the natural rate of increase, from the excess of births over deaths belonging to a normal state of population. Our system of registration of births, deaths, and marriages, is still of such recent introduction and is still so imperfectly observed in many districts, notwithstanding the exertions of Mr. Donnelly the Registrar-General and his assistants, that we cannot attempt to deduce absolute conclusions from our own returns; it is not probable, however, that the true value of life in this country differs sensibly from the average of Great Britain, and by applying the co-efficients obtained from the more matured returns of the sister kingdom we shall arrive at results in which I believe we may place confidence. Taking, therefore, the mean birth-rate at 1 in 31, the mean death-rate at 1 in 45, and the population of Ireland in September 1865, as 5,626,471, we find that the births were 181,499, the deaths amounted to 125,033, giving an excess of births which should have increased our numbers by 56,466, in September, 1866; but that within the twelve months there had emigrated 107,053 persons, being an excess of 10,352 over the number which had emigrated during the preceding year, and converting our natural and proper increase into a most unnatural decrease of 50,587, by the loss of that number of the industrious and energetic members of the labouring classes, leaving behind them a burthen upon the land—the idle, the imbecile, and the diseased. It is not within my province to refer otherwise to this stream in which the life-blood of the nation is annually poured forth, or to consider how it could be arrested or diverted. A considerable diminution in the rate of loss is shown by the returns of the last quarter of this year, and the hope may be suggested that its greatest intensity has passed away. Many members of our Society are well qualified to discuss this question, and I have no doubt but that during the coming session it will receive proper attention.

I have mentioned that in calculating the above numbers, I employed the values for the birth and death rates as obtained from the British returns, those being, as I believed, the most accurate. This merely arises from the more recent introduction of the system here, which renders it necessarily for some time incomplete. In every year greater exactness will be attained, and already we can trace in the returns of the present year, greater completeness than in those of the year preceding.

The value of life at birth, that is to say, the number of years which the life of any healthy individual of the community is likely to endure, is in these countries forty-one years. The great problem of civilization should be to increase the value of life, and to prolong that time during which the individual can be of service to himself,

to his family, and to the state. But to be of service, mere existence is not enough; a population of fever-stricken, consumptive, or imbecile individuals could not support a state or constitute a nation, and it is therefore the necessary condition for human progress and civilization that proper provision should be made for maintaining the population in a state of health, so far as such can be done by human means. To this end, several important legislative measures have been adopted of late years in the sister kingdom, and within the last few months, under the pressure of the alarm caused by the advent of the epidemic from which this country is not as yet quite free, we have obtained a consolidated and improved Sanitary Act for Ireland, organising under the direction of the public authorities an admirable system of control and supervision, through which it may be hoped that those agencies, whether of commission or of omission, by which disease might be generated or conveyed, may be, if not absolutely removed, at least materially narrowed in their range of influence, and mitigated in their force. We are indebted to our able and energetic Honorary Secretary, Dr. Hancock, for an excellent report and digest of the enactments belonging to this subject.

The most indispensable requirements for the maintainance of health are personal and domestic cleanliness, full access of light, and proper supply of air. Without these conditions being fulfilled, a population will necessarily be short lived, and even whilst living will be so deficient in vital force and energy as to fall rapidly under the influence of any miasmatic or contagious virus which may happen to be generated or introduced. This subject has been well-treated of by my friend Dr. Mapother, in his excellent Lectures on Hygiene, delivered at the Royal College of Surgeons, in the reports which he has made officially as Officer of health to the Municipal Council, and in papers which he has read before this Society. He has called special attention to the evils of overcrowding in the abodes of the poorer classes; to the entire violation of all sanitary laws in which their wretched existence pines away. In every large town the tendency to overcrowding of the poorer classes of the people arising from their natural instinct of association, from the necessity for living near their work, from their ignorance of the dangers to which they are exposed, and the indifference or dislike to improvement which that ignorance engenders, has always been one of the most powerful agents in the spread of contagious diseases. In Dublin, owing unfortunately to the decay of a large portion of the city, by which mansions, once the residences of the rich and great, have become the tenements of the miserably poor, the evils of overcrowding do not take precisely the same form as in the manufacturing towns of Great Britain, where the constantly growing numbers of of workmen accumulating within the same space has produced such bad results. Even in Dublin, however, and even in our provincial towns, Dr. Mapother has shown that tenements occupied by our working classes present some of the very worst features as to disease and filth that could occur, and it is fortunate that the lately increased powers which the legislature has conferred upon the civic

authorities will lead to the establishment of a standard of minimum accommodation, which must be provided in all tenement lodgings, under a direct and unavoidable penalty. By such means a great deal of this evil may be abated.

In the prevention of disease, therefore, so far as hygienic measures are concerned, you will observe that I place foremost those means which have for their object to elevate the standard of living, and to increase the vital force; to raise the life-energy of the people: 1st, to enable, by cleanliness, the skin to perform those functions by which a proper equilibrium of the solid and liquid constituents of our system and the healthy constitution of our tissues is preserved: 2nd, by a proper supply of air to afford to the lungs the requisite means for aerating the blood, and supporting that combustion of the carbonaceous elements of the food by which the temperature, necessary for the existence of animal life, is maintained: and 3rd, to obtain full access of light, the true vivifier, the great source of energy in nature, without which neither chemical nor physiological action can be duly carried on. If those beneficial agencies are present, the influence of contagious miasma may be comparatively little dreaded. Those sources of disease of which we are only now beginning to have any real or scientific knowledge, are repelled by the energetic vitality of a healthy frame, and exercise their fatal powers in preference on weakened organisations.

The special means of cleanliness for the people must naturally be, a copious supply of pure and well aerated water, not merely in such quantity as may suffice for domestic use, for the exigencies of personal purification and for public baths and washhouses, but also what may be necessary for the complete removal of the debris and refuse materials which must accumulate wherever animals collect, and the decomposition of which proves often the most dangerous source of moral degradation and disease. Cleanliness is truly next to godliness; and there is no duty more imperative on those who have charge of the public administration of large cities, than to provide abundant means for the removal of all collections of sewage materials from the inhabited places, and to afford even to the poorest portion of the population the means of personal and domestic purification. You are all aware of the great scale on which the proposed new water supply of Dublin is now being organized; the cyclopean reservoirs, the gigantic pipes, the successive stages of whose slow construction have been festively celebrated. Let us hope that before very long the expected water supply shall be actually placed at the disposal of the citizens, and that the promised advantages to the security of life and property against fire, to the health, the cleanliness, and the safety of the people, may be realized.

The progress of investigation of late years has rendered it probable that many if not all of the diseases which we describe under the term contagious, from their being in some way or other communicable from one person to another, are produced by organic germs capable of rapid reproduction, which, emanating from one diseased individual, may be carried, through the air, or by means of clothing, or of another person himself not affected, and may generate the

disease elsewhere, when they find a suitable situation. Such maladies constitute the class now known as zymotic or ferment diseases, as the contagious matter is believed to be analogous to the bodies termed ferments in their power of rapid reproduction and development, where they find suitable material to act upon. It would be out of place, even if time allowed, were I to enter here into any detailed account or discussion of those interesting questions of contagion. The phenomena are so varied, and apparently so contradictory, that, until lately, the question of the contagious or non-contagious nature of various diseases was keenly debated. Those questions have lost much of their importance now that we understand more accurately in what contagion really consists, and that the means of avoiding or counteracting its influence are better known.

Some general observations on the nature of the matter of contagion and the processes by which it is spread, so far as the subject admits of popular explanation, may, however, not be considered irrelevant to the general sanitary question with which we are engaged.

Mysterious and complicated as are those phenomena, analogous to fermentation, by which it is supposed that certain contagious or zymotic diseases are produced, that process does not suffice to explain all the circumstances under which disease is communicated, and we are obliged to admit that in many and in some of the gravest instances, morbid influences are propagated through the agency of beings of a higher organization. Science has demonstrated that man and other animals are themselves the material means and pabulum of existence to myriads of beings more or less minute, and of which in many cases we can only infer the existence from their lamentable effects: that probably every living organism is itself truly a microcosm, a world in itself, in which infinite series of lesser organisms live and die, carrying in their life or in their death the elements of disease and inevitable decay to the being in which they have been formed. We thus may recognize among the maladies which are known as infectious or contagious the two groups of fermentative and of parasitic diseases; of the former we may regard small-pox as the characteristic type, with probably oriental plague and the cattle disease from whose ravages this country has so far fortunately escaped. In those the virus may be transferred by inoculation, and acting on materials naturally existing in the blood generates by a fermentative action matter of the same kind, which often tends to eliminate itself from the system under various external forms. Not so easily explained as results of fermentative action are the phenomena presented by the spread of the contagion of Asiatic cholera and typhus fever. Those terrible pestilences appear to inflict their ravages by other means, and many phenomena appear to lead to the belief that those and some similar forms of disease are generated by means of minute beings which being diffused through the atmosphere, settle down on certain places, or on certain individuals, in a most irregular and anomalous way, although in all cases favoured by want of cleanliness, of drainage, and of ventilation, and often directly supplied through water and through communica-

tion with diseased persons or places. Such diseases do not admit of being directly reproduced by inoculation, nor can in most cases, any distinct virus be exhibited; but this is probably due to the imperfection of our means of investigation, and not to any real distinction in the two classes of disease. The transference of such organic germs is illustrated by the curious form of fever which has been epidemic for the last few years in Central Germany, and which has been traced to the development in the muscular tissue of the human body of a microscopic worm, the *trichina spiralis*, which obtains entrance from diseased meat, especially pork, having been used as food. In this extraordinary disease, every part of the muscular tissue becomes infested with this minute animal, and a small bit of diseased muscle if inserted in the muscle of a healthy animal transplants the parasite, which then lives and multiplies in its new position, to the imminent risk of the individual who has afforded it a home. It may interest some of my friends here to know that this little worm, although showing utter indifference to every kind of drugs, has an intense dislike to alcohol, and the only individuals in Central Germany who have been latterly able to eat diseased meat with impunity have been those reckless individuals who washed down their roast pork and sausages with copious libations of corn brandy.

From the more definite knowledge of the nature of contagious influences which these observations will serve to indicate, it is apparent that in placing cleanliness, personal and domestic, at the head of the means for preventing or checking the spread of disease, I but carried out the strict principles of science. Every collection of filth, every space occupied by stagnant water or often respired air, becomes a favourable position for the growth and diffusion of those germs of infection. By their being diluted and removed by fresh currents of air, by frequent ablutions, and by drainage, their power to do evil is abated if not destroyed, whilst the freshened energies of life conferred upon the system by the action of those sanative means, enable the organs to resist and to reject those morbid influences to which otherwise they might have succumbed. To those means of resisting disease, however, we need not be necessarily restricted; we may call in the assistance of science in another form, and not merely removing the infectious matter, we may altogether destroy and decompose it by means of suitable disinfecting agents.

Under the name of disinfectants are, however, often confounded two different classes of agents which it is very important to distinguish: Those which merely disguise, and those which really destroy the morbid matter. So invariably are filth and disease associated, that the foetid emanations which cleanliness and ventilation would soon remove, are often confounded with the actual substance of contagion, and it is thought that by perfumes and fumigations which can overpower by a stronger smell the foetor of dirt and sickness, the danger of infection can be removed. This has often proved a fatal mistake, although often also it has acted beneficially by inspiring confidence and exalting the vital force which then was able to escape occasions of disease, under which otherwise the system might have sunk.

Nothing can be considered as really a disinfectant but what can actually destroy the organic germs upon which the propagation of disease depends. Of such bodies chlorine is by far the most available, and the most powerful. The direct decomposing action which it exercises on all organic bodies, and the consequent destruction of all vitality in organic germs, such as might propagate disease, renders it the most valuable agent for sanitary purposes that we possess; whilst the facility with which it can be applied in various forms, as gas, as liquid, and in solid combination enables it to be adapted to the most varied circumstances. It is only necessary to avoid the liberation in any confined space of such a quantity of chlorine gas as might affect respiration, or produce irritation of the lungs: and this is easily done. Gaseous chlorine when respired has no other injurious effect: it is not in any way poisonous. Many other chemical agents which combine with or decompose organic bodies are also excellent disinfectants, as sulphurous acid, and especially permanganate of potash: this body, which is a very powerful oxidizing agent, is now very frequently employed to detect the presence of abnormal quantities of organic matter in air or water. In fact, any substance which is capable of arresting fermentation by destroying the vitality and energy of the organisms which constitute an active ferment, will, for the same reason, arrest and destroy the matter of contagion.

These disinfecting agents, chlorine especially, have the property of destroying foul smells by the same process, of changing the nature of the fetid material, and generating other bodies which are free from practical inconvenience. They are therefore very usefully employed for the purpose of deodorizing or disinfecting, those words being popularly considered synonymous, the sewage and other similar materials which would otherwise become offensive nuisances. It is, however, very necessary to distinguish between these two actions: an atmosphere apparently pure and bright, may be loaded with typhoid emanations; a water clear, fresh-tasting, and sparkling may be infected with the cholera poison derived from drainage through the soil from the neglected sewage of neighbouring infected places. On the other hand, the air of a chemical laboratory, or of a manufactory, may be offensive from the escape of ill-smelling gases or vapours, and yet be totally incapable of producing contagious disease. An atmosphere may, however, be injurious to life from the presence of directly poisonous gases independently of any power of producing contagious disease; and may thus be vitiated by overcrowding, by exhalations from cellars and pits; by the proximity of lime or cement kilns, which diffuse the poisonous gases, carbonic acid, and carbonic oxide. Such air may be rapidly fatal if respired, and yet present no sensible indication of the danger. On the other hand, although sulphide of hydrogen is extremely poisonous when respired; such is the disgusting smell and taste of air containing even one ten-thousandth part of its volume of that gas, that attention is at once called to its presence, and the danger may be avoided. By means of chlorine this poisonous gas is at once destroyed, other compounds being formed which are free from any injurious properties.

A very interesting subject has been discussed lately in relation to the salubrity of the atmosphere, in which a peculiar material termed ozone has been supposed to play an important part. You will find an excellent resumé of what has been suggested regarding this ozone in the lectures on public health delivered by Dr. Mapother. It is certain that the free open air of the country and particularly near the sea, presents to re-agents many of the characters which belong to ozone, or rather to the presence of an oxidizing agent, for the ozone itself is believed to be a modification of the natural oxygen of the atmosphere, and that this oxidizing or ozonic re-action of the air is lost or absent in air which has been often breathed, or that is vitiated by the emanations of decomposing organic matter. It is hence pretty certain that air presenting the re-actions of ozone is purer and better suited to support energetic life than the air more or less foul which does not show this re-action; but whether this oxidizing re-action in the air is in reality due to the presence of ozone has been latterly more and more called in question. The same re-actions are produced by the presence of minute traces of nitric and nitrous acids. These bodies are continually generated in the air by the unceasing disturbances of electrical equilibrium. The gradual oxidation of organic matter which takes place on the surface of the soil, and in the air itself, also generates those acids, and their quantity in the atmosphere is usually such as to fully explain the re-actions which have been attributed to ozone. I do not myself express an opinion on the subject; I only give the results of chemical enquiry so far as it has as yet been carried on. It is, however, certain that the air itself is constantly and powerfully converting the effete organic residues of animal and vegetable life into the materials from which new forms of animals and plants are to be produced, and that thus the never-ceasing cycle of vitality ordained by an all-wise providence is harmoniously carried on—the close of one phase of physical existence supplying the materials from which the substance of the plants and animals of a succeeding generation are to be formed.

This is no merely abstract or speculative principle. The successive utilization of the same material elements in the formation of successive phases of organic life is the basis of practical agriculture; on it rests the whole science of the application of manures. It has the most direct influence on the economy of large cities and on the prosperity of nations; for there is little doubt but that after allowing for the moral and political agencies which contributed to the destruction of the great empires of antiquity from Babylon to Rome, no insignificant element is to be found in the impoverishment of the neighbouring territories, the produce of which was consumed within the great cities without any equivalent being returned to the soil. Hence those lands became finally incapable of supplying food, and the population became dependant on the produce of distant countries, with which a political connexion unstable and precarious could not permanently be maintained.

On a smaller scale the same process is going on in modern nations, and indeed with an accelerated pace among ourselves. Every

country which is an exporter of food, diminishes by so much its power to produce food. The mineral elements of food, the earthy phosphates of which the bony skeleton is composed, exist in the soil, but only to a limited extent, and the supply should soon come to an end if not compensated for by the restoration of as much of the same material under the form of manure. In new countries according as the soil of one district becomes exhausted, the cultivation passes to another, but even in America this can no longer be easily done. With us, it is of course impossible, and we must bear in mind that for every ton of bone that we send out of the country we are so much poorer in capital unless we replace it by a ton of bone brought from some other source. Hence the influence of a large city like Dublin is necessarily to impoverish the soil of the surrounding districts, unless means be taken to restore to the soil the residual materials of the food which has served for the support of the inhabitants. The question of sewage to which I have already referred in connexion with the means of health and cleanliness, assumes thus additional importance when considered in relation to restoring the productive powers of the soil. The utilization of town sewage, however, must depend for its practicability on many complex conditions as to form and locality, upon considerations not merely of chemical and engineering skill, but also of financial prudence. Into those matters it would be impossible for me to enter; as regards this city the subject is in the hands of the municipal authorities, assisted by eminent professional opinions, and from what I have seen of the plans recently under consideration, I have no doubt that before very long we shall see our river and its quays restored to their primitive salubrity, whilst what is now a source of defilement and disease, will afford the means of reclaiming new lands to profitable cultivation, and afford new sources for the supply of food.

I have thus endeavoured to explain in a simple form the general principles of Sanitary Science, as constituting the third branch of the business of this Society. We have seen that a large class of those diseases which are most destructive, especially to the poor, are in a great degree preventible, by the adoption of simple hygienic means, by cleanliness, by ventilation, and by the use of those disinfecting agents which science teaches us to employ. In the foregoing remarks I have not adverted to that which lies at the basis of all sanitary requirements: the means of providing for the people a proper supply of food. Good and sound nourishment is in itself a powerful sanitary agent, enabling the system to resist tendencies to disease, under which, with a lower standard of living, it would have sunk. So direct is the connexion between zymotic disease and want of food that the term famine-fever has been adopted in medical classification for that form of epidemic of which in 1847 we had in this country so fearful an example—we must not, however, now enter into that subject. The means for providing the people with good and abundant food is to be found in facilitating the access of the people to industrial employment, and rendering that employment grateful by securing that the worker shall enjoy the product of his toil. In such form, however, the question touches upon matters

belonging rather to the practical statesman than to the statistical enquirer, and on which it would be unsuitable for me to dwell.

In another aspect, however, the influence of sanitary conditions on the material and financial conditions of the working classes may legitimately be considered here. In no way is the suffering from sickness more severely felt than in the destitution which almost invariably attends the protracted illness of the bread-winner of a family; and the consequent loss of the weekly wages upon which the support of a wife and children usually depends. The inevitable reduction in the amount and quality of food; the absorption of any little fund of savings which the providence of better times had formed; the pledging of the little stock of furniture and clothing; the gradual sinking into destitution, and the loss of energy and hope which throws the family into the conditions most conducive to the still further propagation of disease. It is true that in most of the trades benevolent societies are organized, from which, when properly conducted, great benefits are derived, and much assistance is afforded to their members suffering from sickness; but the sphere of action of such societies is still very limited, and the actual loss of money capital, not to speak of physical suffering and moral depression, consequent upon the spread among the working classes of preventible diseases, presents proportions well calculated to arrest attention when we submit it to enquiry.

My friend Dr. Mapother has very kindly obtained for me some returns illustrating the proportion of time lost through sickness by the working men in various employments in this city. Those estimates, into the details of which I need not enter here, as I hope the subject will be brought fully under the notice of the Society at another time, represent the proportion of illness under the circumstances which render it a minimum, as in those employments no absolutely sickly person would be retained. It appears, however, that the average time during which a workman is prevented from earning by illness is from four to twelve days in the year, or as we may take it $2\frac{1}{2}$ per cent. of the whole period. Now as there is estimated to be in Dublin of the classes living upon wages 100,000 individuals we may judge how great, even when taken at its lowest average rate, must be the actual loss in money to the working classes, and consequently to the state, from illness of which, as one fifth of the total deaths are estimated to result from zymotic diseases, a large part could be avoided by the adoption of sanitary precautions.

But the amount of money measured in this way represents but a very small part of the injury to society, and loss of capital which results from the spread of disease among the working classes. I have mentioned in the early part of this address that the mean value of life in this country is forty one years, which signifies that every child born may be expected in average to live so long. But if the perils of childhood have been escaped, then the value of life becomes much greater, and a person who has arrived at manhood in health, may be expected in average to survive to the age of sixty-three years. This should allow of marriage, and of the children

being reared until the youngest was able to earn its subsistence, and under those circumstances, the family is self-supporting: it is a strength and stability to the state as an element of population: but if from exposure to contagion, or other influence of disease, the provider for such a family dies before the children have attained such power of independent existence, then the family is thrown upon its friends or upon the poor rates for support, and hence we have in our workhouses such numbers of widows and orphans hopelessly supported at the public charge. Contrast with these sources of unproductive expenditure, the cost of any or all the sanitary provisions which have been or may be proposed, and it will be seen that whether we regard our water supply, our sewage arrangements, or other means for bringing cleanliness and comfort to the dwellings of the poor, not merely do the dictates of philanthropy and of Christian charity direct them to be carried out in an abundant and liberal spirit, but the narrowest instincts of self-preservation, and the practical calculation of ultimate economy teach us the same lesson.

In this city, where the excellence, the numbers, and the importance of our medical charities are so well known, it is not necessary for me to refer to the subject of medical assistance in connection with sanitary reform. Medicines, and even the most sedulous care on the part of the physician, do not suffice to alleviate the mental and bodily sufferings of the fever-stricken father, or console by timely and appropriate assistance the anxious family. For such aid a more tender and sympathising helper must be sought, and whether we look to the wards of our splendid hospitals, or to the crowded lanes and alleys of our town, we find on this sacred mission the nursing Sisters of Mercy and of Charity, defying all that is repulsive to our weaker nature, all that is most dangerous in pestilence and death, to bring to the bed of sickness whatever can tend to physical relief; to the pillow of the departing the words of heavenly peace and hope. That holy ministry of truest charity is fortunately not limited to the members of one country or of one creed. The name of Florence Nightingale honoured everywhere and loved by all, typifies the same burning charity which kindling in other breasts a similar ardour, has given origin in London, in Liverpool, and in other cities, to the missions of trained district nurses among the poor, and to the formation of schools for educating nurses for hospitals, and for private requirements. By such means a want will be supplied which every physician and every person conversant with the necessities of the sick, rich as well as poor, has felt to be of great importance. To such enterprises, most useful auxiliaries to the progress of sanitary reform, we can give our entire approval. Let us hope that we shall before long see still farther extensions of such practical beneficence among ourselves, bearing in mind the words of the Apostle, that of the three things which abide amongst us, faith, hope, and charity, the greatest of all is charity.

I feel that I have occupied this assembly to an unseemly length, and perhaps exhausted your patience: but the subject was one which from its scientific interest and its practical importance, car-

ried me further, almost against my will, than I had at first intended. I thank you for the kind patience with which you have heard what I had to say, and I hope that this meeting will prove a good augury of the session which the Society has now commenced.

II.—*Report of the Council at the Opening of the Twentieth Session.*

[Read Tuesday, 27th November, 1866]

At the commencement of this, the Twentieth Session of our Society, we feel much pleasure in congratulating you on its continued progress, and the success which has attended its efforts in promoting the great social and scientific ends contemplated by its founders. The number of members and the amount of our finances are each year steadily increasing.

During the recent session several valuable papers were read, some of them devoted to a consideration of subjects of present interest—all of them dealing with questions of vast social importance. Early in the session, Dr. Mapother read a paper on the important subject of Sanitary Reform, in which he called attention to the unhealthiness of Irish towns, and the evils arising from the want of sanitary legislation, and the defective and insufficient powers of the local authorities. Since then this subject has received the attention of the Legislature, and, by the Sanitary-Act of 1866, the central and local authorities in this country have been invested with all the same powers and authorities as are now possessed by similar bodies in the sister kingdom, and are enabled to take effective measures towards remedying that unhealthy condition which Dr. Mapother, in his valuable paper, has shown to distinguish so many of our towns.

The period having arrived when the Government, by the Act of 1844, would be enabled to treat for the purchase of railways, and a Royal Commission, before which several of our members have been examined, being engaged for some time in investigating the matter, the subject of Railway Reform and Management has become one of the great questions of the day. On this subject three papers were read, which led to very interesting discussions. One was on "The Relation of the State to Railways," by Mr. Joseph J. Murphy; another by Dr. Hancock, on "The Financial Position of Irish Railways"; and the third, on "The French System of Railways," by Mr. Alexander McDonnell.

Upon the question of affording government security to the savings of the poor by life insurance and annuities, Mr. Michael J. O'Shaughnessy contributed a paper, in which he called attention to the Government Assurance and Annuity Acts of 1853 and 1864 (16 and 17 Vict. cap. 45; 27 and 28 Vict. cap. 43), and the great advantage of having their provisions brought into operation in Ireland, and we have much pleasure in being able to state that