

provided with similar facilities in the same way, and all are subject to the provisions of the Public Health Act, which, in the greater part of Lancashire, is doubly effective, as the sanitary districts are mostly of an urban character.

In fixing their Congress at Leicester the year before last, the Sanitary Institute was not afraid to beard the lion of Anti-Vaccination in his den; (to little purpose, I fear, if the statements of a letter in the *Times* of September 19th, 1887, are well founded). Let it not be said that we come only to prophesy smooth things at Bolton. We know the energy and capacity of the Lancastrian population. We must not shrink from holding up before them the highest ideal; and I may add, the material advantages which are involved in determined efforts after sanitary improvements. Thus our visit to the north may become, as we should desire, a useful stimulus locally, as well as a signal manifesto of the principles we profess, and of the great national objects we have in view.

SECTION I. SANITARY SCIENCE & PREVENTIVE MEDICINE.

— ADDRESS,

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PRESIDENT OF THE SECTION.

THE causes of disease, with which preventive medicine has to deal, are so numerous and so various that it is, first of all, necessary to arrange and classify them in some logical order. This I have attempted to do in the scheme which follows, premising that it is of provisional character only, and may be found useful as a working assistant until something better is propounded to take its place.

1. The first division is between those which are inherent in the individual and those which are brought to bear upon him from outside. In the former category are to be found hereditary constitution, sex, age and temperament; in the latter, all those influences which disturb the balance of income and expenditure of both material or ponderable, and of immaterial or imponderable elements.

Every one has his life conditioned by the former. There is no possibility of eradicating the conditions, or of modifying them, when once developed in an individual; but their effects may be prevented from becoming disease, by timely recognition and counteraction. Every one, on the other hand, requires for the healthy performance of vital functions, an equilibrium between the income of material—in the form of food, air, and the like—as well as the income of heat, light, and other forces, and the expenditure or excretion, or going out of material, and of energy.

Income may be wrong in quantity, or unwholesome in quality, while outgo may be at the same time defective; and so to the introduction of new poison from without is added retained poison from within. It is by the recognition of these causes of disease, and the employment of all our antagonistic powers,

that preventive medicine may presume to be scientific in its method, and successful in its results.

The first of the inherent causes of disease is—

A. HEREDITY. There are many conditions passed down from one generation to another that are not morbid, such as configuration, height, mental and moral qualities, which are said to "run in families," but with which we have nothing to do here. But there are others which are morbid, the influences of which we have to cope with, and if possible to intercept. They may be arranged under the heads of (1) redundancy or (2) deficiency of organs; (3) arrests of development; (4) unhealthy conditions of function or structure of particular organs, or systems of organs; (5) disturbances of the whole body, diathetic, constitutional diseases, the tendency to which does or does not show itself until different epochs of life, when specific trophic changes occur; and (6) special proclivities to "take diseases" coming from outside; and conversely, insusceptibilities of analogous kind which latter cannot be regarded as morbid, but which may sometimes prove traitorous if relied upon too implicitly.

Speaking generally the power which the physician has to diminish hereditary disease lies in two directions (*a*), the forestalling of morbidity by the prevention of ill-assorted marriages; and (*b*), the special guidance of tainted children, by all measures that can be used or devised for the purpose, by controlling moral, mental, social, and physical education, and regimen of life. This must be commenced before birth, continued in the nursery and schoolroom, and maintained during manhood, and even to declining years.

a. Marriages of consanguinity, even when there may be the very rare event of freedom from all taint on either side, are well known to become, in the second, third, or fourth generation, the source of much deformity and misery; and this in spite of all special statistics to the contrary. Marriages of consanguinity unfortunately "run in families," and so intensify the evil; and they are doubly difficult to circumvent, first because of the primary bias to their contraction, and then because the poor creatures thus produced are specimens of Nature's workmanship in its most untidy mood; features have rarely been duly chiselled; the sense of beauty has long been dead; while gauche figures and manners often render the victims little short of repulsive to all but those who, born under like conditions, have their faculties of perception so maimed and blunted that they know no better, and are also debarred by their own defects, from making any higher choice.

This is but a feeble account of what occurs too frequently

when some distinct hereditary taints do exist in a family, and where marriages among its members have been permitted. Definite disease, as well as deformity, is the too frequent result; and the result is both persistent and aggravated until, happily, sterilisation may set in. No one can doubt the power of "artificial selection" in the production and perpetuation of advantages or peculiarities that may have been accidentally or artificially brought about. No one can doubt the force of "natural selection" along the lines of utility and the most consummate art; and no one can fail to see, or ought to fail to see, that there exists in man the power to modify the race to which he belongs; and acting up to his highest light, in all the paths of knowledge, to use his art to diminish or destroy that which has within it, at its beginning, the seeds of its own inherent decay, being assured that if he does his work well, nature will internally perform the rest. Conversely every change, accidental or inherited, which limits the capacities of life, is liable to become fixed by transmission through successive generations.

But (*b*) there are marriages taking place daily, not those of consanguinity, but of unhealthy people, and of those who are actually suffering from developed disease, of marked hereditary character, or from as yet undeveloped taint, and this often happens when the taint is very strongly exhibited in other members of the family. Let it always be remembered that hereditary taint, although undeveloped, is in itself disease, and then the grave character of the responsibility of propagating it may be, if not duly, approximately gauged. The function of the physician is to examine carefully, and advise discreetly. He must weigh *all* the parts of the family history,—and here he will meet with the greatest difficulty, for often the facts are not known, or, when known, are either concealed or misrepresented. He must form an opinion of the intensity of the hereditariness in each particular malady, and also in the family under consideration; and he must have the courage of his convictions. This may make him unpopular or hated, but he must be strong enough to do his duty, and find, in doing it, his reward.

But it is in a very small minority of cases that preventive medicine is ever called into operation in this early stage. The minority is as small as the majority is vast in which the physician is consulted before disease has advanced into open and obvious activity.

The devices that must be employed to prevent the development or further progress of inherited disease, are as manifold as the affections themselves, and some further insight into the

prevalence of the latter may be gained by a simple enumeration of those which are the most familiar. But here let me make two remarks by way of caution. First: there is no disease that has yet been shown to be *always* hereditary in its origin, so that, *e.g.*, when we meet with insanity or phthisis in an individual we are not, at once, to conclude that it was "inherited" by him because a parent had been epileptic, or a grand-parent had died of consumption. A large proportion of hereditary diseases can be traced to no hereditary source in particular individuals, therefore we must allow that, in a large number of cases where the possibility of inheritance is patent, a certain number may have developed the disease *de novo*. Secondly, with regard to many people the anti-hygienic conditions and habits which have led to disease in their ancestors may be persistent as cherished heirlooms, and be effective for mischief now. Especially is this the case with regard to the large group of diseases of the nervous system. There is much more than the mere physical contamination by descent in the etiologic conditions of a boy or girl, who may be brought up in constant association with an idle, self-indulgent, hypochondriacal or drunken father; and it is quite impossible to over-estimate the dire misfortune to a girl of being educated by an hysterical mother. No high powers of the microscope are needed to discover the *modus operandi* of the *materies morbi* of the contagium of "bad example."

I pass now to some special examples: 1st, the redundancy; 2nd, the deficiency; as well as 3rd, the arrested development of certain organs afford scope for the teratologist rather than the physician. They furnish illustrations of curious facts in heredity, and in this way are interesting and instructive, and may be useful. Hare-lip is so often the result of a mental impression made upon the mother, that the sequence of events cannot be confined to the chapter of accidents; the same is true with regard to supernumerary fingers or toes, and these peculiarities are liable to recurrence through successive generations. Observe here that the original cause of the deformity was not hereditary but accidental, and yet that it became hereditary. This question of the hereditary transmission of acquired habits or conditions is still *sub judice*, but to my mind many of the facts recorded by Darwin are susceptible of this interpretation, notwithstanding the very strong evidence afforded to the contrary by the history of the habits of the Mahometans and Hebrews.

4. Morbid conditions of function or structure of particular organs or sets of organs, and such as do not affect the *general* health, are very commonly met with, and for some of them

much may be done. These may be resolved mainly into organic changes which limit, derange or destroy, functional activity. (a) The organs of special sense furnish the best examples of this class. Almost every variety of limitation or perversion of the sense of sight, from slight myopia to absolute amaurosis, seems to run in families. Sometimes the defects are congenital, sometimes they appear in adolescence, and again they may be deferred until declining years. It is in the early recognition of these maladies that the main hope of amelioration is to be found. Ophthalmic science is a growth of our own day, and its powers are now being used for the education and strengthening of the healthy eye; in the timely correction or removal of some sources of deficiency; and the supply of optical instruments to reduce to a minimum the disabilities with which some are born and which others acquire. Whatever may have been the prescience of our forefathers and their skill in surgery, it has been reserved for the latter part of this century to see "the blind receive their sight," and these not only among the favoured few but among the multitude; and still further, not as the result of any painful operation, or in the face of any risk, but simply by adding to a profound and scientific knowledge of the structure and functions of the eye the aid yielded by a mastery of the sister science of optics.

(b) Deaf-mutism, again, may be hereditary, congenital, or acquired, and some of the most astounding results of training have been witnessed in this field. A congenital deaf-mute, if left alone, becomes as a rule an imbecile; one who has been born with language and hearing but has lost them both in early life, may become the same, if nothing be done to educate him, while the results of due teaching are marvellous. Two boys, brothers, were brought to me at about three and five years of age; they were congenital deaf-mutes and imbeciles, and examples of the same miserable condition were found in other members of the family. A very clever, most patient and persevering tutor was found for these boys, and when the elder was between eleven and twelve years of age he had been taught to read, write, and speak with accuracy.

He could read not only from books but from the lip or from the hand; could articulate very well; could parse a sentence in English and translate it into French or German! There are thousands in this country who have no advantage of this kind, and so they remain to the end of their days mere vegetating boys and girls, or men and women, a burden to their relatives and a disgrace to the community.

5. The fifth group of hereditary diseases is one so large that it seems to include almost all the maladies that flesh is heir to,

except those that are the result of direct introduction of poison from outside. They are as numerous as the organs of the body, and as various as the possibilities of change. Such inherited ailments agree however, in their consisting of a general tendency to disturbance of varied functions and structures, and in their becoming expressed in the form of so-called diathetic or "constitutional" disease.

If there are, on the one side, occasional examples of hereditary "nervousness," or simple epilepsy; there are, on the other, tubercle, scrofula, Bright's disease, and others about which it may be truly said, "the whole head is sick, the whole heart is faint, and there is no soundness in it." Yet, even in extreme cases, preventive medicine has its work to do.

(a) The condition of ill health most frequently met with in hereditary diseases of the nervous system, is one of undue liability to disturbance;—given in any one of the antecedents of a particular individual, either insanity, epilepsy, hysteria, tendency to excesses, great nervousness, or what not, the outcome may be any other of the maladies mentioned, and not at all necessarily a reproduction of the initial disease. It is by bearing this fact in mind that the physician will see the necessity of being armed at all points. It is not enough to avoid or counteract the tendency to convulsions in the first dentition, the second, or the third, but other diseases such as chorea, hysteria, wilfulness, tricky ways, cruelty, and deceit must be borne in mind. No routine practice will be useful; it is often worse than useless. For example a child at twelve becomes nervous and restless, his father had fits when he was young, and is an odd man now; some other members of the family had convulsions, an uncle was epileptic, and therefore this is regarded as a case for bromine, a diet restricted to insipid inefficiency, books are to be put aside, school abandoned, the boy petted and pampered at home in the bosom of his family, several of whom are somewhat queer, and so—in spite of bromide and of a redundancy of counsel—he becomes a victim to the very malady from which so much was done with the intent to protect him; and this and the like has happened scores of times in my experience, when the boy was simply anæmic, wayward, underfed, and not quite straightforward in his ways, and really required iron, not bromine; good food and plenty of it; the discipline of school, as well as its work; the companionship and the sports of his own sex, instead of the petting of his sisters, and little brothers, over whom he tyrannised in secret, and so escaped the thrashing he deserved.

Another illustration of the like mistake is seen often in girls, whose mothers have passed through an early life of indulgent

petting into one of hystero-mania, or egomania, and gradually into that of chronic silliness and self-absorption, and then follows the sacrifice of parent, husband, child, or friend to each and all of her foolish whims. "No one has ever opposed her," "She has always had her own way;" this is what we are told, therefore she must go on as she has been doing, and her daughter must follow suit. There is nothing the matter with the girl except occasional migraine, from some real or hypothetical fasting, or from sitting up at night without food poring over a trashy novel. She can sit a horse, but she cannot sit upright in a chair; she can play lawn-tennis, but she cannot walk; she cannot sit out "morning church," but she can dance for five consecutive hours. "She is just like her mother," her relatives exclaim; "we dare not thwart her, or she will become as bad," and so she goes her own ways and fulfils their worst predictions. These are but common illustrations of the fault of thinking that hereditary disease must take its parent form; or of acting upon the presumption that, as the form is the same, there is nothing to be done. On the contrary, much may be done by taking patients from home, and all its evil ways; giving regular employment of useful sort; exercise of mind and body; fresh air, good food, plenty of rest at reasonable hours, and utterly declining to admit the existence of anything but a slight malady that needs, however, definite treatment, and that of the kind described.

(b) Of gout, rheumatism, tubercle, scrofula, syphilis, cancer, Bright's disease, and many others, it is only necessary to observe that to be forewarned is to be forearmed: and that, when there may be a strongly marked hereditary taint, its development into disease may often be delayed or eradicated by timely care. We lose more lives through carelessness than through ignorance. May not the thin limbed, and thin faced boy, with pink and white complexion, over tall for his age, who easily perspires and passes lithates; whose temperature and pulse run up quickly; who declares that he is very well until some general languor or local pain compel him to give in,—might he not often be saved from attacks of acute rheumatism, by careful habits, food, clothing, and medicine, and so spared all the troubles of a damaged heart? We have to look for these things, not have them thrust upon us. The day may be yet distant, but it will surely come when regulated physical examination of the bodies of the young will be as necessary and as common as examination in the Latin grammar, or the multiplication table, or other matters.

6. But there is another group of hereditary conditions, not common, but well marked, viz., a proclivity to "take diseases,"

sometimes of several sorts, sometimes of one only, for, *e.g.*, such as scarlet fever or whooping-cough. The converse condition of insusceptibility cannot be regarded as a morbid condition. Caution as to exposure is almost as important in the one case as in the other, for rashness is not without its victims, and to this allusion has been made already. Many precautions must be taken on behalf of those who have hereditary taint, for the conditions may be multiform, which come together to produce from it the fully developed disease. As an example of popular knowledge on this point I quote a paragraph from *The Times* of Sept. 12th, in its review of Mr. Colvin's recent "Life of Keats." The writer says, after alluding to the eminently pugnacious character of the poet in early life, "It was not till the hereditary taint of consumption, which had already killed his brother, became developed by the over-exertion of a walking tour in Scotland, that pecuniary troubles, caused by a stupid and stolidly unsympathetic guardian, combined with the hope deferred of a long engagement to Fanny Browne, and perhaps to some extent the disappointment of literary ambition, fostered a certain morbid tendency of his nature, if the term 'morbid' can fairly be applied to a turn of mind to which literature owes some of its greatest masterpieces."

B. SEX has always found its place among the "predisposing causes of disease"; and if general etiology were the theme of this address there is very much that ought to be said regarding it. But as the physician has no power to direct the production of boys or girls respectively, all that preventive medicine can do is to guide the development of each. Organs must be present to take on morbid action, but the *differentia* of sex are far wider than the possession on the one hand of ovaries, and on the other of testicles. The moral, mental, and physical conditions and aptitudes of the two sexes differ; and while civilisation has intensified, through generations, these *differentia*, the tendency of much recent fashion—I cannot call it civilisation—has been to diminish them: so that we encounter on every hand manly or "masculine" women and effeminate men. In uttering its protest against this perversion of nature, this devolution instead of evolution of the race, preventive medicine may be of service.

There is nothing to my mind more simply silly than the "cant" or "slang" that has been uttered about the "superior" and the "inferior" sex. Each may be perfect in its way, but each is spoiled when it apes the other. In rough conditions of life women may have been, and are now, better fitted for physical labour than are those whose very configuration and faculties have been modified by social habits of refinement; and it

certainly is not the aim of the obstetric physician, either man or woman, to encourage the development of the "masculine pelvis."

It is worthy of note, here, that it is not the highest qualities of man that young women imitate, but rather, on the one hand, the roughness of the youth, his bravado, and uncouth language; or on the other, the lackadaisical *nil admirari* tone of the pedant and the fop; with, it may be, an occasional dash into imitation of excessive learning, and the habits of the ascetic or recluse. The men who mock women's ways also mock their foibles, not their strength; and lisp and sigh or groan out their unsatisfied longings in vapid admiration of sentimental nonsense, whether it be in poetry, music, or painting, and find out something "quite too lovely" in a line, a strain, or a daub, that no sensible man would care to hear or see again.

The brain of women is not improved by being roughened or over-strained; and the emotional nature of man is enfeebled by this reversal of the order of Nature; and we find the tendencies to disease inverted without any advantage to either. The physician may, I think, do much in counteracting this tendency of the present day; protesting, on the one hand, against all foolish pruderies, mock-modesties, and the like; and, on the other, encouraging healthy habits of body and mind, always bearing in mind that the highest type to aim at is the perfection of woman and the perfection of man, and not the production of moral and mental hermaphrodites which, thank Heaven, are usually sterile.

Let it not be supposed that I do other than admire the great strides that have been made of late years, in the higher education of women, both for intellectual and practical work. These may be readily overdone as they are in men, and very frequently the results of over-strain are seen in illness, incapacity, and distress. Their exhibition, however, is less painful than the frivolous inaptitude and idleness of men, who, with all social and educational advantages, do nothing, never occupy themselves with any calling or pursuit, but are content to "bide or loaf about" and live upon their incomes, or their friends as the case may be. Over-strained women often become sour and cynical, and morbid, as do briefless barristers and unpopular parsons, who may have much laboriously gathered learning in their brains, but no congenial work to do. They complain of like discomforts, "diminished brain-power," as the favourite expression goes, and entire dissatisfaction with everything and everybody. Under-occupied men become hysterical and silly, and the prey to every form of hypochondriacal misery. It is the highest sphere of man and of woman to be the complement of

each other, and to combine in the work of home first, and then of all around it; but the work of the one should be a woman's work, and of the other, "all that may become a man." It is in the imitation of the ways of the other sex that women become repulsive, and man despicable.

With regard to sexual proclivities to organic diseases, there is something for the physician to do in being forearmed. For example, the greater frequency of simple ulcer of the stomach, of erythema nodosum, goitre exophthalmica, and the like in women; and of angina pectoris, carcinoma ventriculi, locomotor ataxy, and other maladies in men, may be of service not only in diagnosis and prognosis, but in treatment.

There is, however, much that prevention may do by regulating the habits of boys and girls. In healthy exercise, the avoidance of over-strain of muscles and prolonged fatigue; in wholesome food and sufficient rest; and in a score of ways many a trouble which might easily become developed into disease may be avoided. Many cases of heart and lung disease originate in the rough games of schools; many of the troubles of women in their indolent and unwholesome school-room and after life, in the follies of their dress, and the hours they keep.

C. AGE. We know much, but understand little, of the time-ordered events of life. There is an average pulse and respiration time; there is the incubative period of life as well as of the exanthemata; dentition, puberty, climatic changes, and decay have their relations, more or less fixed, with time; and a knowledge of the predispositions attending various ages may be of service in the prevention of disease. In infancy the thermogenesis is low and the capacity for digestion limited to certain kinds and quantities of food; so that danger lurks in defective clothing, and defective feeding. There is rapid development, and the reflex functions are over-active, so that there is undue proclivity to spasm, not only of the voluntary muscles, but of the vessels; for spasm may cause infantile paralysis as well as infantile convulsion. Febrile conditions are common, and so are local disturbances of the circulation, such as internal congestions, and other forms of congestion not internal, such as chilblains. It is by regard to the nursery, the clothing, the food, and the surrounding conditions of domestic kind, that the physician will ward off much disease.

In dentition—whether the 1st, 2nd or 3rd—the nervous conditions which precede as well as accompany the eruption of the teeth must be duly regarded and foreseen, and so, many troubles averted before local discomfort of the gums has taken place.

At puberty it is by guiding the *general* habits of the individual, rather than by looking after possible *local* troubles; by maintaining a healthy tone of domestic life rather than by special treatment, that the physician will do his best to prevent disease. We are too often disposed to be looking for some special sign of change, forgetting that "change" is always going on; and so, sometimes, we may let golden moments or months pass by unused. The follicle of the wisdom tooth may be found in the embryo jaw; and many of the evils of all the so-called "changes of life," exist long before any special events have made them obvious. Bearing these thoughts in mind we may always see much to guide us in advising those upon whom "age" is stealing, but who have as yet had no warning that it is so, for they are "younger than their years." Those who are "older" often come quite soon enough, but rarely too soon, for help. The horizon of thought and work ought to be made smaller when memory becomes treacherous, arteries rigid, and the heart's impulse low. Timely caution, based on facts which only the doctor knows, or from the revelations made to him in his confessional—although carefully concealed at home—might save hundreds of "shocks," or more slowly growing and increasing griefs, when some unlooked-for "break-down" occurs, and relations and friends exclaim, "This is quite too terrible; he seemed so young a man, and was only yesterday quite busy at his work, and full of life and schemes." He ought *not* to have been busy at his work.

As in babyhood we are exposed to the wills and whims of others, to carelessness, stupidity, or over-fussing; to bad feeding, neglect, or exanthemata; to tumbles, broken legs, or other frivolities; so, later on, when the romantic period of youth—be it for learning or for play,—has done its best or worst, and *early middle life* begins, the exposures fraught with danger are those of over-excitement and over-work, and against these the physician knows only too well how much he could do if the patient would but hear and follow. We pass on to *middle life*: sometimes a wholesome table-land, but often a still arduous, too arduous climb, or a slow decadence of failure and dismay; and we see success leading to excess on the one hand, or failure plunging into dishonesty or despair upon the other, and here too we must again warn in time; and as the life goes on to its *second infancy*, through an emotional epoch of pitiful weakness, a senile hysteria, the physician has again to use all his care to see that he, who has outlived all those who gave him joyous welcome to his cradle, is yet tended as he should be, and piously cared for to his shroud.

There is no stage of life at which we are not wanted, no age

when we are without anything to do, and let us be ever mindful of our high responsibility of foresight, being assured that in the vast majority of instances we, in spite of many prejudices, shall find ready adjutants thankful for any hints that we may give; and, by doing our work well, be spared having to frame an answer to the terrible question sometimes, quite fairly put, "Why did you not tell me this before?"

D. TEMPERAMENT is a word more frequently used than analysed; and although its striking forms are known to all, it sometimes happens that its influence on the tendency to disease is disregarded until the disease is brought about. The physician, however, should be on his guard, and try to prevent the "sanguine" youth or man from relying too complacently on his energy—which may not always mean strength—and so protect him from the consequences of undue hopefulness, carelessness, and from many troubles he had not in the least degree anticipated. On the other hand, the "phlegmatic" may have their morbid proclivities lessened or removed by timely warning, and rousing to a sense of duty; while the "nervous" may be strengthened against their trouble by the wise counsel of the physician, who may have the art of obtaining confidence, and speaking with authority.

II.—I come now to the *second* great group of "causes of disease," to which I alluded at the outset, viz., the disturbances of the equilibrium or balance between the necessary elements of income and expenditure, whether these be of matter or of force. It is absolutely necessary for health that we should "take in" certain things and forces, and that we should "give out" others. It is also essential that what we "take in" should be wholesome, and conducive to healthy life.

This range of subjects is so wide and varied that I can but enumerate some of them, and point out, generally, wherein the physician can act in the prevention of disease.

A. Income is both material and immaterial, or ponderable and imponderable; we need food and air, light and heat on the one hand; excretion of material, and exertion of nerve and muscle on the other. These should be balanced, or we are not in health.

1. The *income* of matter involves all that is included under the head of "Food,"—solid, liquid, and gaseous,—which may be either defective or excessive in quantity, or wrong in quality. The absence of certain elements, such as vegetables, for example, has its entail of scurvy; while deficiencies of either the albuminous, amylaceous, oleaginous, or saline elements produce their

specific morbid changes. Deficiency of food of all kinds is often, too often, sadly, the cause of multiform maladies; associated, as it almost invariably is, with other anti-hygienic conditions, such as over-work, over-crowding, and intemperance. Excessive feeding, on the other hand, which at last brings its own remedy in loss of appetite, may on the way to that stage, produce a hundred maladies of every organ in the body.

But the great source of disease, against which preventive medicine has shown its strongest powers, and with which it now wages war the most vigorously and incessantly, is the introduction of noxious matter, either with food, by the air we breathe, or by direct inoculation.

The appliances of science have done much to diminish the evils that arise from the metallic or other poisons, such as lead, mercury, antimony, steel, phosphorus, and the like; and the mode in which good has been obtained is by the prevention of their entry into the organism, and also by rendering assistance in their excretion. In like manner those more subtle poisons, which are the physical bases of all zymotic disease, are to be robbed of their power for mischief mainly by being kept out of the body. The physician has found out the sources of many of these poisons, as well as the modes by which they enter the body, and having done so has devised means for their arrest. The *materies morbi* has been separated from much that had surrounded it, and measures for its modification or destruction have been discovered and applied. Our knowledge of the definite importation of cholera, typhoid, and more recently of some outbreaks of scarlet fever, by means of water and of milk, and further, the knowledge that by simply boiling these fluids the poisonous material is deprived of its power for mischief, afford grounds for hope that, by increased observation, the sources of other maladies may be found, and means for their destruction be devised.

The magnificent results that have been obtained and demonstrated with regard to vaccination and variola have stimulated the zeal of many enthusiastic workers, and raised—as almost all beneficial discoveries have done before—a perfect tempest of opposition, misrepresentation, and frivolous and irrelevant talk. The questions of syphilisation and of inoculation for rabies must be regarded as still *sub judice*; but a sufficiently strong case has been made out in regard of both these poisons, not only to justify, but to demand further enquiry.

2. There are certain imponderables, such as heat, light and electricity, that we require for healthy life, and the deficiency in the income of which is the frequent cause of disease.

(a) We all need external warmth, and at the extremes of age the need is greatest. Many follies of habit may be rectified by the physician, even although in some individuals the constitution is so marvellously elastic that it can bear an amount of illusage that would kill many a race of animals. Whatever may be said of the process of "hardening" by exposure, it surely cannot be a universal advantage to undress under the trees of Hyde Park, in an east wind and drizzle, at 7 a.m. in the winter months, plunge into the half-frozen Serpentine, and get home to breakfast cold and blue, with chattering teeth, and exclaim with a mixture of pharisaism and apology in tone, "It is when it is cold as this that it does you all the good in the world!" There is much "tubbing" and bathing in the present day that is excessive, unphysiological, and mischievous, and there are endless follies in the form of clothing that the physician can do little to cope with simply because there are two much more popular preachers than he, viz., fashion and fad.

Excessive heat has some injurious effects in itself, but the really active sources of heat-disease in hot climates are the malarial or other poisons which are there, and the injudicious clothing, eating, and drinking which in too many places are habitual. The occupations which expose stokers, furnace-men, and the like to intense heat may be rendered nearly if not quite innocuous by attention to clothing, to the length of exposure, to the full supply of water and of fresh air, and to the alternation of work done with periods of due freedom from exposure; these things to be arranged with knowledge of the wants entailed by special kinds of labour in individual cases. To the philanthropy of employers, and the zeal for all sorts of social improvements in a rapidly growing class of men, as well as to the labours of the men of science, are we indebted for the prevention of much of the evil that excessive heat might bring about.

(b) The absence or deficiency of light, and especially of sunlight, shows its morbid effects in the impaired health of miners, navigators, workmen in cellars, in city offices, and in the night. The night-working to which I refer is such as must limit the income of sunlight to a considerable degree. Those who suffer most are the reporters, literateurs, printers, writers, and many others whose work is nocturnal exclusively, and who require some distinct changes to be made in their habits.

Anæmia is the prominent mischief brought about by deprivation of light, and anæmia means very much—very much more than mere pallor of the skin. There is no organ in the body which it does not affect; it cannot be uprooted by iron or food, or fresh air, or any other means save that of light; and we do

well in prescribing this early in the anæmia of night-working men.

The exposure to excess of light may be mischievous to the eye in many ways, but the prevention of such trouble is obvious, viz., the avoidance of such exposure. But the great majority of cases of "insolation," are to be traced to the co-operation with exposure to light, of excessive heat, bad air in tents, and barracks, unfit clothing, and irregularity of habits, together with over-exertion, and early neglect of symptoms.

(c) Electrical disturbances of health, such as occur in electric and magnetic storms afford much interesting matter for examination, but they are of comparatively rare occurrence, and are often susceptible of explanation by mental and moral rather than physical conditions.

(d) There is, however, another very common source of discomfort and disease increasing year by year in this restless age: I mean that of physical concussion of the body as a whole, or of its parts. "Accidents" show us what violent concussion may effect in one moment; but daily life points out a more serious danger than accident can do. A great amount of shaking and knocking about may be borne by some with impunity, but there are hundreds, nay, even thousands, who are now steadily, slowly but surely damaging themselves by constant travelling, and especially by railway. Such travelling is often accompanied by hard work, much worry, and exposure to the changes of temperature, which make up what we are pleased to consider as, and call, "our climate." But beside and above all these the mere recurrence of shaking or "shock" is observable enough. The most prominent effects are irritability of temper, restless fatigue, want of power of application, defective memory, want of confidence, and want of judgment, with insomnia or uneasy sleep, and depression of spirits. The jar of frequently stopping suburban trains is more commonly and quite as seriously damaging as are the occupations which lead men to travel many hundreds of miles per week. Crying children, who will not be rested by a gentle rhythmic movement, may be shaken to something like sleep by a vigorous nurse; and so may the busy man who, paper in hand, jumps into a first-class carriage at the end of a day of work and worry, and is concussed into a sort of coma by six to seven minutes of the train. In the early stages of such troubles, some modification of the daily mode of transit may be of service; but when the discomforts have gone to the point of destroying sleep, appetite, and relish for work, nothing but an absolute cessation of the travelling is of the smallest service.

B. The next great group of causes of disease may be put under the one head of modified expenditure as compared with income. There must be in health an outgoing of both material and of energy; and disease is actually present, lurking near, or very easily brought in when arrest of excretion is present.

1. The excretion of *material* is as essential as its introduction. (a) Arrest of "excretion" introduces "local" troubles, which tell back and limit "secretion," and this latter limitation becomes at once a "general" or "constitutional" disease. Retained cutaneous excreta produce acne and miliaria; arrested secretion may be followed by pleurodynia, sciatica, local paralysis, pleuritis, or any other inflammation. So with the urinary organs. Arrest of excretion affects the bladder, and the kidneys by a backward action, but the non-action of the kidneys places life in imminent peril from toxæmia of most urgent sort. So with the bowels,—habit, laziness, shyness, or what not, may lead to hernia, or apoplexy, by the straining they induce; but more frequently hemorrhoids, accumulations of fecal matter, and their consequences, are the immediate result; but if the intestinal secretion be either arrested or misdirected then grave constitutional disturbance is present or at hand. The same principles hold good with regard to all the systems of the body. The physician has to guide with regard to "excretion"; but common sense, about matters that are mere "pathological pap" to himself, he will find absolutely wanting, and it dictates quite unappreciable by otherwise well-informed and capable men and women, as well as by boys and girls. Want of attention to "excretion" may be long concealed, but a suppressed "secretion" at once places the patient in the doctor's hands. General medicine may do much for both, but its true rôle is in prevention.

But (b) evacuations may be excessive, and these of either blood itself, or of other fluids containing it, or its main elements in large proportion. It is enough to mention the drain of hæmorrhoids, or of menorrhagia, the exhaustion of chronic diarrhœa, diuresis, or diaphoresis, and leucorrhœa to indicate the directions in which preventive medicine may do its best; only again emphasising the common fact that these things have often to be looked for to be discovered, and then some considerable discount allowed as to the accuracy of statements made from either delicacy, the wish to be let alone, ignorance, or the "little knowledge" carried to the point of "danger," conceit, caprice, or stupidity.

2. In controlling the amount, quality, and conditions of

"expenditure," in *mental, moral, and physical* directions, the physician has a wide range of work. The elimination of force is as important as is that of matter.

There is, on many sides—mental, moral, and physical—a tendency to meet excesses of one kind with excesses of another. There is a "polarity," so to speak, in society, to be seen in the way and degree to which overwork goes along with—I cannot say begets—underwork; mental strain is associated with mental idleness; eager attempts to solve moral and social questions by something more rapid than a motto of mere "solvitur ambulando" impotence, side by side with the lazy "nil admirari," provoking egotism and uselessness of full-blown or unripe swiftness; while at the same time the training of the physical athlete is seen in heightened contrast by glancing at the waxy, cumbersome, dull stupidity of those who take no bodily exercise beyond that of lounging in the carriage or the club, diversified only by the too-frequent cigarette.

(a) Defective mental occupation begets—by way of bad hours, alcoholism, a love for poor literature, and self-indulgent habits—silliness, self-consideration, egoism, hysteria, hypochondriasis, and progressive feebleness of mind, memory, and understanding. Ten talents may earn another ten; or, *per contra*, they may be abused or lost, with character to boot, by simply being laid aside or hid in a napkin; for it is not the man with *one* talent only that may call upon himself the strong disapprobation of his Lord. To use the powers we have, and incite others to do the same, is a part of our work in the prevention of disease.

Again, the moral nature of man and of society may be stunted, misapplied, or blotted out by simple indolence. How often do we not meet with people who care nothing for anything or anybody but themselves; who read both sides of a debate, a philosophical dispute, or a police report, with a languid indifference, and without ever caring to exercise their own thought as to which is right or wrong, "because it's such a bore to make it out, don't you know,"—until, by steady practice of not using the brains he has, his one little talent has shrivelled up, and when he may, perchance try, to turn it to some account, he finds that somebody or some conditions have put a brass farthing in its place. This don't-careism of young people so common now may be somewhat improved by parents and tutors, but it is the physician who will do more than either if he uses his opportunities aright.

The mere allusion that I have made to the deficiency of "physical" exertion, is enough to point out the true line that preventive medicine has to take. It is not so much in youth

as in middle life that its effects are shown, and our powers are often limited to the diminution of troubles as they occur, rather than to their prevention beforehand.

(b) In this part of "the Nineteenth Century" we come into contact with excess of work,—mental, moral and physical—on almost every hand. But let us, so far as consequences to health are concerned,—at once distinguish between work with worry and work without; which comes almost to mean voluntary and involuntary exertion. Work does not hurt much, worry does. Some are put to learn or do things that they are unfit for, and they suffer. The work may be of the kind that they cannot do, or the amount required may be out of proportion to their strength. Some men can no more learn mathematics than others can music. There is a *Pons Asinorum* somewhere, not only in Euclid, for almost everyone, and much trouble of school, and college, and after-life might be entirely spared if relatives and tutors would recognize the fact.

Mental work is not excessive if the appetite be good and the sleep sound; if these be interfered with, the student or the athlete (in muscle) is doing too much. Work for its own sake is beneficial, but under the pressure of an examination looming in the distance, or of some panic in business, work, to get over the difficulty, is often made excessive, and then worry comes on, with its train of physical troubles that attend loss of appetite and loss of rest. The functions of all organs are damaged, and well is it for the man who has the physician for his friend to help him how to arrange his life.

The effects of sudden moral shock are known almost as well as those of physical concussion; but the long continued wear and tear of a life, distracted by a conflict of emotions, is often unsuspected or unrecognised until it is too late.

Hysteria, melancholia, paralysis agitans, a confusion of ideas and purposes when any attempt is made to use them—what I have called a mental and moral chorea—through incapacity of mind, and loss of all decision and precision of thought are the most common events; but, with this, there often comes as well, some strange moral perversion, taking the form of extreme melancholia and self-accusation most frequently, but occasionally running into another, still more lamentable state, viz., that of general paralysis of the insane.

The only excess of physical exertion to which I will allude now is that of such kind as shall embarrass the heart and nervous system. There are no physical exertions which, in themselves are necessarily detrimental to the heart. Rowing, riding, walking, running, climbing, in reasonable moderation or only occasional excess are beneficial, and highly so; but when the amount of

necessary exertion is compressed into a deficient amount of time then it becomes mischievous. The heart has its own special relationships to time, and if these are seriously or persistently disturbed both functions and structure suffer. An exertion which quickens the pulse and respiration may be harmless if within certain bounds; but if the eyes become prominent, the face flushed, the lips livid, and the extremities cold and dusky, the danger point is reached. The line is an easy one to draw but a difficult one to keep. Yet I am sure it is not out of our power to help. Many cases of heart-strain may be greatly relieved by rest, and it is by violent rather than continued over-exertion that the brain becomes gravely affected. But too prolonged or too extreme an amount of physical exercise has its victims, suffering from weakened arms and legs, and other evidences of spinal exhaustion.

The fatigue of excessive muscular exertion upon the nervous system is seen in loss of sleep and appetite in a small scale; but its effects upon armies on the march has been seen in an increased frequency and severity of traumatic tetanus and other affections, partly induced by worry, defective food and clothing, and often by accompanying depression. Epilepsy, chorea, paralysis, and the like I have often found to date from physical fatigue, and to have their recurrences almost invariably traceable to the same cause occasionally brought into play.

That which we denote "preventive medicine" when applied to individuals, becomes general "sanitary science" when we have to deal with masses; and it is only by a careful scrutiny of all the *causes* of disease that we can render that science as efficient as it ought to be. It has sometimes happened that researches in one direction, and for the attainment of one end, have been unexpectedly the means of throwing much valuable light upon cognate or outlying matters, such, for example, as the relation, almost accidentally discovered, between the drying of the soil in sundry towns and the diminution of phthisis; but in the main it has been by earnest, planned, and persistent industry that the great achievements of science have been possible.

Life is lengthened, its existence rendered less painful and more hopeful, and its ailments so much reduced by what has been already accomplished, that—given what is wanted in time and in freedom of research—there seem to be scarcely any limits to the good that we may predict for future generations. Diseases, our enemies, one after another may be diminished, rendered harmless, or stamped out of existence. The adaptation of

man to his environment may be so greatly improved, his frame so fitted to resist not only disease but natural decay, that its pains and weakness may disappear, and be remembered only in the history of evolution, and thus its inevitable end may be without either suffering or fear. The moral nature may be so attuned to its highest faith, and so free from fret, sorrow, or remorse, that death will be welcomed as was birth, for the last "enemy" that shall be destroyed is death; destroyed, *i.e.*, by being no longer our enemy but our friend.

On "Notes on the Sanitary Improvements of Bolton during the ten years ending 1886, with the more important statistics for this period as compared with the preceding decade," by EDWARD SERGEANT, L.R.C.P.Lond., Medical Officer of Health, Bolton.

It will be my endeavour to give as concisely as possible the history of some of our sanitary undertakings, with the experience gained thereby. In common with many sanitary authorities, we have had occasion to consider from time to time important questions appertaining to health, including hospital accommodation, notification of infectious diseases, disinfection, refuse disposal, &c., when these matters were comparatively new, and the public had to undergo a period of education before they would accept them. Fortunately a fresh era has commenced, and there is no longer any need to grope in the dark, for the public have light and are alive to the necessity of the above-mentioned requirements, and it will not be long before they are generally adopted. The statistics appended are eminently striking, and do not require any detailed analysis on my part.

Table I. shews the annual mortality with the principal zymotic deaths, &c., during the ten years 1877-86.

Year.	Estimated population.	Total deaths.	Rate of mortality.	Deaths of children under 1 year.	Deaths of children between 1 & 5 yrs.	Percentage of deaths under 5 yrs. to total deaths.	Deaths from						Percentage of deaths from principal zymotic causes to total deaths.	
							Small-pox.	Measles.	Scarlet fever.	Diphtheria.	Whooping cough.	Fever.		Diarrhoea, including English cholera.
1877	95,500	2226	23.5	610	461	48.0	...	53	106	3	100	49	106	18.7
1878	105,000	2313	22.0	717	466	51.1	...	42	144	2	61	39	206	21.5
1879	105,000	2233	21.0	616	341	42.8	...	14	45	3	97	42	62	11.8
1880*	106,700	2835	20.5	832	645	52.0	1	216	112	1	89	27	245	24.4
1881	105,414	2022	19.1	575	306	43.5	...	1	31	2	119	25	91	13.3
1882	106,767	2277	21.3	650	479	49.5	12	146	21	9	72	29	152	19.3
1883	107,862	2157	19.9	633	283	42.4	...	2	6	4	35	25	152	10.3
1884	108,968	2615	24.0	717	503	46.6	...	111	15	2	106	33	211	18.2
1885	110,085	2282	20.7	612	307	40.2	1	38	9	5	58	18	83	9.2
1886	111,214	2572	23.1	697	472	45.4	...	137	16	7	75	18	156	15.9
Average for 10 years..		2353	21.5	666	426	46.1	1.4	76	50	3.8	81	30	146	16.2

* Fifteen months.

Table II. gives the mortality extending over the ten years 1867-76.

Year.	Estimated population.	Total deaths.	Rate of mortality.	Deaths of children		Percentage of deaths under 5 yrs. to total deaths.	Small-pox.	Deaths from					Diarrhoea, including English cholera.	Percentage of deaths from principal zymotic cause to total deaths.	
				under 1 year.	between 1 & 5 yrs.			Measles.	Scarlet fever.	Diphtheria.	Whooping cough.	Fever.			
1867	77,468	2218	29.0	667	525	51.0	..	3	239	..	91	61	129	24.9	
1868	78,704	1956	25.0	619	389	53.0	..	113	28	7	10	52	201	21.6	
1869	79,960	2100	26.7	693	374	50.8	..	22	54	35	..	60	69	16.4	
1870	81,400	2233	27.3	752	478	55.0	..	6	45	79	5	17	52	19.3	
1871	82,854	2166	26.1	660	412	49.4	..	20	..	172	3	8	30	20.6	
1872	87,354	2432	28.0	720	536	51.6	..	49	124	96	2	53	66	23.5	
1873	90,000	2097	23.3	616	404	50.1	..	7	4	136	3	100	43	20.8	
1874	91,651	2219	24.3	629	432	47.0	..	3	41	176	1	16	39	19.1	
1875	92,800	2403	26.0	685	463	47.7	..	3	114	38	3	121	45	20.3	
1876	94,300	2199	23.6	628	341	44.0	..	6	26	41	1	44	84	15.5	
Average for 10 years..		2202	25.9	667	435	50.0	..	12	52	104	2	52	51	163	20.2

You will observe that the general mortality during the past ten years has been considerably reduced. The average death-rate being 21.5 per 1000, as against 25.9 per 1000 for the preceding decade. The lessened mortality is represented by an annual saving to the community of over 400 lives, and the amount of sickness prevented must have been enormous.

The infant mortality, which may be taken as a "health barometer" of a town, has also decreased. The general death-rate from zymotic diseases has been sensibly lowered, and the reduction has been most marked in the notified diseases—small-pox, scarlet fever, and fever including typhus and typhoid. It is likely that the greater attention paid to the storage and frequent removal of refuse, and the general sanitary improvements, may have beneficially influenced the diarrhoea death-rate. Measles and whooping cough have not been dealt with as diseases that could be influenced further than by isolation at home—which however is almost impossible in the artizan homes—advice and disinfection: hence we find that these diseases show no diminution but rather an upward tendency during the past ten years. No doubt, as the ramparts against infection are extended, measles and whooping cough will have to be included in the list of notified diseases, and hospital accommodation will be required for their isolation, but at the present time we are not quite prepared for the additional responsibility.

In 1877 Bolton had the credit of being the first town in the country to obtain from Parliament complete powers for the

compulsory notification of infectious diseases. The duty of reporting is "dual," or imposed on the medical attendant as well as the householder, a system which at the present time is much favoured by sanitary authorities, and it has also the approval of the Local Government Board. Although on this point there is much diversity of opinion, experience shows that information of disease received from the medical practitioner is more prompt and reliable than when coming from the householder, so that whatever method of notification is adopted the responsibility will in the end rest with the medical man. The advantages of notification are now generally acknowledged: in the case of small-pox the disease can be kept in almost perfect check, scarlet fever may be restrained, and there is less danger of the disease being spread broadcast by children attending school in the "peeling stage." In typhoid fever and diphtheria early notification of the existence of diseases is of equal importance, and owing to the knowledge gained we are often enabled to rectify defective drainage, or take means to prevent the dangers which would arise from polluted water or contaminated milk, isolation of these diseases in the hospital being not always practicable. The total diseases notified since our compulsory clause came into force, amount to 7217, made up as follows: small-pox, 323; scarlet fever, 4106; diphtheria, 110; fever, 1151; puerperal fever, 35; and English cholera, 13. During the three years ending 1880, measles was on the list of diseases to be notified, and information was received concerning 1453 cases.

Without a hospital for the isolation of infectious diseases, the benefits derivable from notification would be limited, and on that account the provision of means for the seclusion of the infected sick ought invariably to precede notification. The extent of the hospital accommodation is influenced by notification, for when the latter is carried out efficiently, a small hospital is sufficient for the isolation of the infectious disease which may from time to time occur, but if on the other hand, these first cases owing to their existence being unknown are not secluded, an epidemic is probably the result, and the largest hospital may be inadequate to meet its demands. The Borough fever hospital was built in 1883, but it was not until January 1884 that we had occasion to send in any patients. The hospital has had a continuous use and secured a good reputation which is of much value, as it practically enables us to effect a removal without difficulty in any case we consider desirable. The following cases have been annually treated, 62 in 1884, 120 in 1885, 208 in 1886, and to the end of August this year, 177 cases have already been admitted. The proportion of patients

admitted to diseases notified show an increasing ratio, last year it was 51 per cent. as against 46 per cent. for 1885. The table below gives particulars of the total cases admitted.

AGE—YEARS	All Causes.		Scarlet Fever.		Typhoid Fever.		Small-pox.		Diphtheria.	
	Patients admitted.	Deaths.	Patients admitted.	Deaths.	Patients admitted.	Deaths.	Patients admitted.	Deaths.	Patients admitted.	Deaths.
Under 3	35	2	31	2	...	...	1	...	...	...
Between 3 & 4	33	1	30	1	3	...	...	...	...	...
" 4 " 6	110	3	106	1	2	1	1	...	1	1
" 6 " 10	207	3	200	2	7	1	...	...	...	...
" 10 " 20	143	5	108	...	29	5	6	...	...	...
" 20 " 40	31	4	12	1	10	3	12	...	...	...
40 and upwards.	5	1	...	...	3	1	2	...	...	...
TOTAL ...	567	19	490	7	51	11	22	...	1	1

The death-rate of patients treated has been very favourable, and it is fair to assume that cleanliness, good air, careful feeding, and efficient nursing have beneficially influenced the course of many cases, especially those removed from the houses of the filthy and improvident. The patient is also benefitted by exchanging gloomy, and perhaps unsanitary surroundings, for attentive treatment in a spacious ward, pleasantly situated and provided with all the accessories to make the necessary detention as cheerful as possible. Scarlet fever patients are generally sent into the hospital after the rash and sore throat have decided the diagnosis, and the average duration of treatment in the hospital—and, in my opinion, continuance of "infectiousness"—was, in 1885 and 1886, forty-one days for each year.

The average stay of the typhoid patients treated in the hospital was also forty-one days, and of small-pox thirty days. The total cost of maintenance per patient for last year was only 14s. weekly during the average duration of treatment. By Sec. 132, Public Health Act, a local authority may recover cost of maintenance of patients in hospital, but this power has never been exercised in Bolton, and all residents in the borough, who are not paupers, have an equal right to be admitted. We believe that while good nursing and hospital treatment may prove an advantage to the patient and his friends, the community is equally benefitted in effecting the complete isolation in hospital of infection so that it may cease to be a source of public danger. Hence we avoid the delay and unpopularity which would undoubtedly arise if payment were insisted on in any of the cases admitted.

I may briefly explain that our hospital has already cost over £9000, it is built on the pavilion principle and provides accommodation for the treatment of thirty-two adults, with 2000 cubic feet of air space per patient, and for eight children in cots. The building consists of two one-storied pavilions, an administrative block, and a mortuary and laundry block. The two pavilions are exactly the same in construction, and are placed 60 feet apart with a due north and south aspect, an open verandah runs along the south front of each pavilion, and from the centre of each verandah, and opposite the pavilion entrance, an open covered passage, semi-circular in form, leads to the administrative block, which is a two-storied building. The various buildings are supplied with the usual accommodation required for the purposes of nursing, and great attention has been paid to ventilation by means of warmed air, and to the removal of vitiated air and the offensive products of gas combustion.

The sewage is treated on the premises by precipitation and filtration, and the excreta, contents of beds, and other objectionable matter, are burnt daily in a specially constructed furnace, called an Incinerator, which is found to be of the greatest value. The hospital stands in about three and a half acres of beautifully laid out grounds, and this year a site for a new pavilion has been prepared, and the administrative block enlarged so as to be in readiness for an extension which the increasing popularity of the hospital will soon render absolutely necessary. For disinfection at the hospital we rely chiefly on washing after thorough soaking in a solution of carbolic acid. A small hot air disinfector is in use for articles that cannot without damage be washed in boiling water.

The town disinfection is conducted at a disinfecting establishment at School Hill, which is also provided with a wash-house, mortuary, and furnace for the destruction of articles very filthy or not worth disinfecting. For over nine years the disinfection was conducted in two hot-air chambers, but the process was never considered reliable, for we found that the temperature in different parts of the chambers varied considerably, and after the application of a scorching heat, say 250°, to certain bulky articles, as beds, mattresses, &c., for four or five hours, the temperature registered in the interior of the article was seldom higher than 150° to 180° F. With the new process, which has been in operation about twelve months, namely, superheated steam under pressure, the process of disinfection is more expeditious, for the steam is evenly distributed in the chamber and rapidly permeates the most bulky articles, and it is interesting to know, from the researches of Klein and Koch,

“that the complete penetration of an object by steam heat for more than five minutes is sufficient for its thorough disinfection.” Our steam apparatus is the one patented by Washington Lyon, and so far it has done its work admirably.

The next subject I desire to bring before you, namely, excrement removal, I approach with some trepidation, as it is surrounded with practical difficulties of no ordinary kind. The question was considered in Bolton so far back as 1874, and it was then decided to adopt the Manchester pail system, and this has been followed with some modifications to the present time. We have now in use 6,000 dry ash closets, 8,670 old ashpits, and 1,400 water-closets. Many of the large and offensive ashpits have been converted to the new system, and the effect has been to raise the tone of health of the improved district and lower the deaths from diarrhoea. Water-carriage under favourable circumstances seems to my mind the most complete, most decent, and best adapted for large populations, but many towns from deficiency of water-supply, or owing to the condition of the sewers or outfall, are not suitable for water-carriage. In such cases some form of pail system should be adopted which will allow the refuse to be frequently removed.

The old privy, or midden, which provides for the storage—perhaps for months—of faecal matter, together with all kinds of animal and vegetable refuse within a few feet of the very atmosphere we breathe, is abominable, and ought to be prohibited by law. According to Dr. Buchanan, in all towns where the refuse matters are not removed frequently there is a higher death-rate, especially among children, than where the refuse matters are speedily removed. I do not propose to consider the details of the various forms of pail closets; to my mind the principle involving prompt removal of refuse is good, and the special system adopted is of minor importance. The following classification includes most of the systems in use:

1. Pails without absorbents.
2. Pails with absorbents as ash, earth, &c.
3. Pails with appliances to drain off the liquid portion.

When pails are adopted, the mechanical appliances of the closet should be as simple as possible, and the local authority should be provided with vans, suitable air-tight lids for the pails, and use the greatest care to transport the excreta to the depôt without smell. The cost of collection is increased somewhat, but then the important bearing of such removal on health, as against storage of foul matters in ashpits, should influence largely the consideration of the question. In this town, it has been calculated that the annual cost of scavenging

per house on the new system is 5s. 3d., as compared with 3s. 7d. per house on the old system. The increased cost of scavenging is no doubt large, and one can understand how easy it is for our complicated form of ash-closet to get out of order, especially in the poorer districts of the town; but then, are we justified in reverting to a modified ashpit? or in simplifying the present pail-closet? To my judgment the latter plan seems to commend itself. The bulk of the refuse of the town is taken to an admirably arranged depôt, erected at a cost of £30,000, called Wellington Yard.

The excretal refuse is there ground up with fine ash and formed into a crude manure which is sought after by the farmers, and may be stored in large quantities without producing a smell. The other refuse consisting of cinders, vegetable and house refuse of all kinds, is consumed in what is called Fryer's Destructor, and reduced to about a third its bulk. The outburn from the furnace consisting of clinker is ground up with lime and forms mortar. The amount of refuse consumed daily in this way is about sixty tons, and the mortar produced shows a handsome profit to the department of nearly £1,000 a year.

The time at my disposal will not allow me to do more than refer to the other sanitary works of the town. The new sewage works at Hacken many of you visited yesterday, and had the advantage of a detailed description from the engineer. The arrangement of detritus tanks, settling and mud tanks with the turbine and pump driven by effluent water, seem beautifully adapted both theoretically and practically for efficiently dealing with the sewage of the town and district. The clarifying agent now in use is milk of lime with ground cinders which have passed through the fire of the Destructor, and this is mixed with the sewage at the old works at Burnden, but the apparatus is equally well adapted for the employment of any other precipitating or purifying agent as carbon, alumina, &c. The total cost of the works was a little over £30,000.

The waterworks will be visited on Saturday next and during your stay in Bolton you will have the opportunity of noticing that the water is soft, clear, and of good quality for drinking purposes. The total gathering ground is 3,166 acres and the storage capacity of our reservoir is about 1,000,000,000 gallons. The average daily consumption of water in the town and surrounding district is 5,600,000 gallons, representing a supply of nearly 22 gallons per head daily, for domestic purposes, and 6 gallons per head for trade purposes. The filtering tanks, four in number—three being in use at one time, have a superficial area of 10,000 square yards, and are capable of filtering

5½ million gallons during the 24 hours. The works commenced operation in 1885, and since then the water has been much clearer, and generally improved in quality. The recent drought found us in a better position than most towns, but it also showed the desirability of finding additional storage for the large quantity of water which annually runs to waste.

In conclusion I may mention that during the past ten years much work has been done in the direction of demolishing houses unfit for habitation, opening out close and badly ventilated courts, and improving insanitary dwellings. To effect these improvements we put in force our local acts, which allow of compensation being given, and are more readily worked and considerably less expensive than the Artisans and Labourers Dwellings Act, 1868, or Mr. Cross's Act. The Corporation have not cared to provide house accommodation for the persons displaced, preferring to allow private individuals to undertake the responsibility. No difficulty has arisen on this score, and as an example of private philanthropy the efforts of the late Dr. Chadwick to provide good living accommodation for the working class will long be gratefully remembered.

The system for intercepting the whole of the sewage of the borough has only just been completed at great expense, but much remains to be done for securing ventilation of the older sewers. The bed of the foul stream which passes through the town has been paved to facilitate the flow. Back streets paved with setts and six yards in width have been insisted on, and in many ways our motto has been "onward." Much work yet remains to be done, and it is hoped that the benefit to health of the sanitary improvement of the past few years will prove an incentive to continued progress.

Mr. S. W. NORTH (York), said he did not quite know on what part of the paper they had just heard he could offer any particular observations, except on the question raised in the paper of the notification of infectious diseases. It was not unknown to some of his friends in that room, that some years ago when President of the Yorkshire Association of Medical Officers of Health, he had taken occasion to point out the objections which might be reasonably raised to the notification of infectious diseases by the medical profession. At that time he was merely induced to direct attention to the objections to the way in which notification was proposed as an all but certain method of stamping out these diseases. He had however, since then to some extent modified his opinions, and was disposed to accept

notification as a valuable aid, though he still denied that by its means we should be able to stamp out infectious diseases. In 1884 the Corporation of York had a bill before Parliament for extending the boundaries of the City. At the suggestion of the Committee of the House of Commons, the clauses known under the name of the President were introduced into the bill. One of these clauses enjoined under a penalty the notification to the Sanitary Authority of certain infectious diseases, typhoid fever, scarlet fever, &c., both by the medical man in attendance and the householder, direct notification in fact. Whatever opinion he might have held on the question of notification, the power being given, he felt it his duty to see that the law was fully enforced in the City he represented. He believed that since the adoption of compulsory notification by the Corporation of York, all cases of infectious disease named in the schedule to the act had been reported. He had in his official capacity been brought into contact with all the medical men in that city, and he had never yet known the notification to create the slightest hitch. The forms on which the terms were notified, were sent to him under cover, and he had found they came to him with great celerity and accuracy. As a consequence of careful enquiry spread over the cases of a large amount of disease, he was bound to say that the notification not only reflected the highest credit on the zeal with which the profession gave the notification, but on the care with which they gave it. There had not as yet been a single instance brought to his knowledge in which information as to an infectious disease had been given which was not true. In fact he was bound to say that from the day on which it had been introduced up to the present time the system of notification had worked smoothly, harmoniously, and absolutely honestly. Notwithstanding his opinion expressed and entertained on the question some years ago, he felt determined that when once the clauses were introduced into the City of York, they should at all events have the full benefit of their operation, and with that view he took the following course immediately after their adoption. He framed a code of regulations and instructions for the managers of elementary public schools with regard to these infectious diseases, warning them in various ways what was best to be done. Besides these regulations, he prepared a series of forms and notices, one of which was a form of enquiry, which on the report of an infectious case was immediately sent to the inspector of nuisances. After he received the notice which stated the residence, the number of the family, the number under fourteen years of age, the occupation of the parents, and general observations as to the sanitary condition of the premises, the inspector of nuisances gave a notice in which the parents were forbidden to send their children to any public elementary school from the house in which the infectious disease existed, and at the same time a notice was sent to the master of the school usually attended by the children, and he was instructed not to receive any of the children into his school from that house for a certain specified time. Similarly a note was given to the clerk of the School Attendance Committee, so that the whole of the authorities

concerned were at once made acquainted with the existence of this case of infectious disease. It was only the other day he received from the clerk a letter in which that gentleman expressed the belief that the instructions had been carried out faithfully and most loyally. He had not had to complain in any single instance of the managers of schools. They had done everything they could to act in accordance with the instructions. As to what the result would be as time went on, he could not say. They had had a mild epidemic of scarlet fever in the city spreading over two years. He himself had a strong impression that it had been very considerably diminished by this notification, and by the care they had as a consequence been enabled to exercise in keeping children away from school. It might be only a matter of opinion as to what results would follow from notification, but there was this fact, that it was bound to be of the highest value in affording statistical information of the prevalence of disease, without which it would be impossible to know how to meet it. Last year they had in York a serious outbreak of typhoid fever, which rose with great rapidity. In consequence of having prompt notification, he was enabled without doubt to trace the outbreak (over 100 cases) to the use of milk brought from a farm having three cases of typhoid fever on the premises. With the notification it became so clear that the disease followed the track of the milk-seller, that there could be no doubt as to the cause: the sale was stopped, and the disease at once declined. They in York still lacked what he thought was the natural complement of notification: a free fever hospital. They had a hospital somewhat in the form suggested by Dr. Sergeant, but at present the authorities did not see their way to make it free. They had a charge for admission, which he feared was practically prohibitive so far as poor people were concerned. He hoped before long to see it free. In conclusion, he was bound to say with regard to notification that it worked extremely well. He thought it was too much as yet to say that notification would enable them to stamp out disease. However, he was of opinion that the system had done much good, and he also thought that the system had greatly lessened their difficulties in dealing with infectious disease, and it was teaching an important moral lesson by showing the people that they ought to do their duty to others as they would be done by, and not be indifferent as to the spread of disease.

Professor W. H. CORFIELD (London) said he should much like to bear testimony to the excellence of the paper they had just heard read by Dr. Sergeant. He also wished to congratulate Dr. Sergeant upon the satisfactory results that had attended his administration of the public health of Bolton. The Doctor gave them statistics for the ten years from 1867-76, and for the ten years from 1877-86. He saw from these that whereas the general death-rate for the first period was 25.9, and for the second 21.5, the zymotic death-rate had been reduced from 16.2 to 11.2, a still more significant fact. These reductions in the death-rates they would all agree were of a most important character. With regard to the question of the

notification of infectious diseases, as many of them would remember the Council of the Sanitary Institute determined some years ago to find out what were the real facts about the matter. They accordingly sent out a circular to medical officers of towns where this notification was practised; they had answers from the greater number (about 20) and at the request of the Council he summarised the results, and read a paper on the subject before the Sanitary Institute. The paper would be found in the transactions of the Institute, and it showed that wherever notification had been practised it had been productive of a considerable amount of good, and that the opposition to it was more of a sentimental character than anything else, and was hardly worthy to be regarded as of practical importance. Thus they would see he was of opinion that great advantages might be expected to flow from the medical man reporting direct to the sanitary officer the existence of infectious disease. It was therefore a considerable satisfaction now to find a man like Dr. North saying that compulsory notification had been very successful in the City of York. Dr. Sergeant's experience was also very satisfactory, for although he pointed out that there was still much diversity of opinion, experience showed that information of disease received from the medical practitioner was more prompt and reliable than when coming from the householder; so that whatever method of notification is adopted, the responsibility will in the end rest with the medical man. In most, though not in all of, the districts of London (including the one in which he was located) they had not the system of compulsory notification in force. They might not in London derive *much* benefit from the system, but they would certainly derive some. There were a certain number of cases of small-pox and scarlet fever, but very few, which were not reported, so that with regard to these diseases they were not likely to gain much; but with regard to measles they would probably gain a good deal, because they sometimes got into an epidemic of measles in London before the medical officer was aware of the existence of the disease. This happened to him and he knew it had happened to others. He had indeed been unaware of the disease at all, until death had taken place, or attention had been called to the fact that a large number of children were absent from some particular school on account of measles. There was an impression abroad that they could not prevent the spread of measles, but this impression was erroneous, for it could be prevented spreading both in the household and in the community. How he might be asked could they prevent it spreading in the community? One very effective means was by the closing of schools; by this course they could entirely stop an epidemic, certainly within a very few weeks. Here was another fallacy to which he wished to direct attention. People said, "If you close schools the children will play in the streets and the epidemic will spread still more." That was totally erroneous: the infection did not spread half so quickly in the streets and playgrounds as in the schools. He had found that the closing of the schools in the case of a measles epidemic very quickly had the desired effect. Another important sentence in Dr. Sergeant's paper was where he said: "Water carriage under favourable

circumstances seems to my mind the most complete, most decent, and best adapted for large populations; but many towns from deficiency of water supply, or owing to the condition of the sewers or outfall, are not suitable for water carriage. In such cases some form of pail system should be adopted which will allow the refuse to be frequently removed." He quite agreed with Dr. Sergeant, indeed he was almost going to say it obviously must be so. The great law for the treatment of refuse matter in towns, was that it should be removed as speedily as possible; if this were not done, it became a nuisance, poisonous matters were given off, the air, water and soil became polluted, and the result was great danger to health. There was no method by which the refuse could be got rid of so quickly as by water carriage, and he therefore thoroughly accorded with Dr. Sergeant's advocacy of it.

Mr. E. C. ROBINS, F.R.I.B.A. (London), was very glad to hear what had fallen from the two last speakers on the pail system, and trusted the time would come when the town in which they were met would give it up in preference for the water system. He had just returned from a trip to Norway and Sweden, and found that in the districts of Stockholm and Christiania the pail system was in use. He had an unfortunate experience. He slept with his bedroom window slightly open, and was disgusted during the night with an awful smell. He enquired the reason of the stench, and was told that the pails had been emptied during the night. He mentioned the matter to the Principal of the Gas Works, and asked his opinion of the system. He replied: "Our system is as perfect as it can be; it is under the superintendence of the police, and it is against orders to remove any pail unless the soil is covered with lime or some other disinfectant." He appeared to be perfectly satisfied with the arrangement, though he admitted that the towns suffered very much from diphtheria. However well conducted, his experience was that the pail system was often a great nuisance, and under some circumstances he would prefer the cesspool system, because it could be ventilated and by the pneumatic process emptied without nuisance. It was stated in Christiania that the pails were emptied about every three weeks, instead of three days, as it ought to be.

Dr. ALFRED CARPENTER (Croydon) said that for convenience he proposed to commence at the end of Dr. Sergeant's paper. He noticed that in the last paragraph but one the Doctor said, referring to the question of the removal of dwellings: "The Corporation have not cared to provide house accommodation for the persons displaced, preferring to allow private individuals to undertake the responsibility." He thought this was a very important matter, and showed at any rate that the Corporation looked at their responsibilities in the right direction. To his mind it would be a great mistake for the local authority to provide habitations for the people. It would be as great a mistake as it would be for the state to undertake to feed the people. To do

this the local authority would have to step out of its way and from its proper position, inasmuch as it would be taking up a responsibility which belonged to the private head of a family. Dr. Sergeant also touched upon the water supply, and he noticed with great satisfaction that in this respect Bolton was admirably situated. It had an immense volume of water, and thus there was no reason whatever why they should not adopt that more healthy and cleanly way of dealing with refuse, viz., the water carriage for the removal of excreta, rather than the pail system. If it only was dealt with in the proper way, much could be done; and no one who had witnessed the advantages that belonged to the water carriage, as compared with the pail system, could hesitate for one moment in determining that it was by far the more advantageous. But where the water supply was not sufficient he should say that some modification of the pail system was the right one. But in Bolton, where they had a plentiful supply of water, it appeared to him that it would be a move in the right direction to substitute water-closets for pails. Now he should like to turn for a moment to the question of the excretal refuse deposit at Wellington Yard. He could not help thinking that a very large proportion of the £30,000 spent there might have been saved. But the work was now done, and he would not refer further to that matter. But there was another evil to which he should like to draw attention. It was an evil of a very important character. The amount of refuse daily consigned to Fryer's Destructor was estimated at sixty tons. He thought this was an utter mistake. It seemed to him to be wrong on the part of a local authority to do any such thing. It was wrong from an imperial point of view, and it tended materially to damage the interests of our country, because it simply amounted to this: they were destroying refuse which the soil wanted, and at the same time they were complaining of the deficiency of the production of the soil. Owing to this deficiency they had to import from abroad. They ought not to shut their eyes to the fact that whatever the soil would produce the people would consume, and the less we produced here the more we had to import from other countries. He took it therefore, that in destroying material which would help to produce corn and other food, they were doing an evil to the nation which should at once be stopped. If the material produced in their towns was disposed of on the land in the way it ought to be, the land would produce more, and to that extent they would be less dependent upon foreign nations for their food. This was his objection to the paltry profit of £1,000 a year made in connection with Fryer's Destructor, and which was made at a very serious loss to the country at large. The average cost of sewerage under the new system was higher by 1s. 7d. per house than under the old system: a very small amount compared with the mischief which resulted from the old system. To allow the old system to go on meant the continuance of great sickness in their midst and more frequent deaths. Dr. Sergeant referred to the popularity of the Fever Hospital and the good sense of the Bolton people in making it free to all. He also said it showed the good sense of the people of Bolton, because it was of the greatest importance such an institution

should not be a pauper establishment. He was strongly in favour of the early and rapid removal of infectious cases, if possible, to hospitals, and he was pleased to find that they were so favourably situated. Now he came to the important matter of the notification of disease. For the last thirty years he had argued in favour of notification. He thought Medical Officers should have the earliest and most positive knowledge of the outbreak of infectious disease, and that the starting point of this information should be the medical man. But he had always been opposed to the dual notification, as it existed in Bolton. He took it that it was the duty of the medical man when he came in contact with infectious disease, to at once inform his employer of the nature of that disease, and of the measures that should be taken for its repression and for the prevention of danger to other people. It was his duty to notify that fact to the patient's friends, and indeed to all around the case: and it was the duty of the person in charge of the case to make the communication to the local authority. He would grant that it was much better that the notification should be made by the medical man direct, but he contended that that could be obtained without placing the medical man, as he was placed in Bolton, under the thumb, so to speak, of the Medical Officer of Health. It was possible for the Medical Officer of Health to place his medical confrère in the dock, as a defaulter. It was a mistake to make it compulsory and penal on the medical man, and by that means make the rival in practice the inferior in the court of law. There was a better and more satisfactory way of dealing with the matter than by making every medical man a state official. He objected to the principle of making the medical profession state officials. It was a mistake to suppose that the state had to do everything. It was quite right for the state to say certain things should be done, but he did not think it was always called upon to do these things by its officials, to the exclusion of private individuals. The medical man having notified to the patient or guardian or other person in authority that infectious disease exists, had done his duty, and when the fact was kept secret by the person to whom the notification was made, that person had failed in his duty to the state and as a member of the commonwealth. The Medical Officer of Health having become aware of that default, proceeds against the offender, and asks the Court of Summary Jurisdiction to inflict a penalty upon him for neglecting to do his duty. Say the case was one of small-pox. Then the Medical Officer of Health had the power to put in the witness-box the doctor in charge of the case and to put to him this question: "Did you, or did you not, do your duty in informing the person in charge of his duty to his neighbour, viz., to isolate the case and take measures for preventing the spread of the disease?" If he said no, the doctor convicted himself of neglecting his duty to his patient, and it would do him a greater injury than would the 40s. penalty in consequence of his being proceeded against for non-conveyance of the notice personally to the local authority. If the doctor and the patient's friends shut their mouths, however, the difficulty would be extremely great in proving that a particular case was small-pox or scarlatina, when there is a dual clause. Undoubtedly

friction has arisen between the Medical Officer and his confrères, and information was most grudgingly bestowed. The law was working very well, and so was the notification where there was no penalty upon the medical attendant for not reporting, and if a fee was paid for the certificate. If a law were passed which applied to all persons in all parts of the country, calling upon those in charge of infectious cases to report to the local authority at once, and making it penal if they did not, allowing them at the same time to appoint their medical attendant as their agent, and giving the local authority power to pay for the certificate sent in, he did not think there would be any difficulty as to the required notification being carried on; and unless this was done throughout the country, he did not think it would be effectual to the extent they had a right to ask for. This made him fail to see his way to continue the penalty upon the medical profession for failing to do that which these private acts compelled them to do, viz., creating a new crime and making all medical men to be government officials. The medical profession ought not to allow the penal clause to stand as it did; but they must do their duty in telling those in charge of the patient to report to the local authority, and even to do it for them; and for this service they ought to have the right to an adequate fee.

Dr. JOHN TATHAM (Salford) said he came from a place which, as a separate Sanitary authority, was possibly unknown to them—a place called Salford, which was probably lost sight of on account of its close relation to Manchester. Nevertheless it was a municipality which contained 218,000 inhabitants; *i.e.*, double the population of Bolton. Since the year 1882 Salford had enjoyed the benefit of notification and hospital isolation, and therefore they had had a fair amount of experience, and he would add his testimony to that of Dr. North as to the advantages of notification. It was agreed that compulsory notification of infectious diseases was not to be all and end all of sanitation, they simply looked upon it as a means, and he begged to say it was a very valuable means to an end. Dr. Sergeant enjoyed the notoriety of having fought the battle of notification in troublous times, and he had fought it fearlessly and well. His own experience was the same as Dr. Sergeant's. Dr. Carpenter's main objection was to the penal clause as affecting medical men, but Dr. Carpenter must excuse him for saying that this objection appeared to him to exist only in the Doctor's imagination, for it certainly did not exist in practice. He was quite sure that when he told them that in five years he had had notified something like 7,000 cases, and that in no instance had he had to go into court against a medical practitioner or against a ratepayer, they would at once agree with him when he said that the act in his own borough had worked satisfactorily. He should like very much to secure, either at the hands of the Registrar-General or from the Local Government Board, a weekly return of the cases of infectious disease which occurred in various parts of the country, in order that from time to time, they might have warnings as to what kinds of infectious disease were

likely to be locally prevalent, and in order that they might fortify themselves against epidemic. At present there were no such returns, but it would be of immense advantage to Officers of Health like himself if such a system could be initiated.

Mr. COUNCILLOR JOHN BARRETT (Bolton) said that with regard to what had fallen from Dr. Carpenter as to the operations at the Bolton Wellington Yard Depot, he wished to inform the Congress that by far the greater bulk of the material named as being burnt by the "Destructors" was of no manurial value whatever. He granted that by a careful process of mixing, it would be rendered of such a nature that it would very likely not be objected to by the farmers who took it away. But they had the greatest possible difficulty in dealing with the quantity of manure taken to the Depot. Very often they had during one part of the year a total stock of something like 5,000 or 6,000 tons. When the happy time arrived foreshadowed by Dr. Carpenter, when all this manure would be required by the farmer, he was sure the Committee would be very glad to dispense with burning anything they could possibly dispose of at a profit. At present they offered farmers in the district the manure at the lowest possible price—they only asked one shilling per ton, but still they had a difficulty of disposing of it even at that low price. He was sure he, as Chairman of the Committee, would be very glad when they could dispose of this refuse in some profitable manner other than cremation.

Dr. J. W. MASON (Hull) wished to speak especially on the question of excremental refuse removal. He represented a town of 196,000 inhabitants, which had possibly a unique position in the history of sanitation. It was what was known as a "privy" town. They in Hull, although not having the pail system, had adopted what they considered an efficient privy; and they had also established a system of weekly collection of night-soil—the Corporation having arranged with contractors who collected the night-soil and dry dust at least once weekly, and removed it outside the precincts of the borough as it was collected. In the whole they had over 40,000 privies. That was a very large number, and the result of the institution of a weekly collection had been that complaints, which had been at one time of almost daily occurrence, had now become very few, averaging only about one a week. He could not do otherwise than congratulate the town of Bolton on the efficiency with which their Corporation had looked after similar matters. It had been said that the death-rate of a town corresponded with the collection of excreta. Whether this was the case or not, he thought he might fully claim that in the town he represented, the substitution of a continuous for an intermittent sewage system and the weekly collection of excreta had been instrumental in lowering the death-rate, which had possibly been one of the highest in the kingdom, so that now the town enjoyed the enviable distinction of being one of the lowest, so far as death-rate was concerned, in any of the urban populations of the country. He

quite agreed that the water carriage system was preferable in large towns where it was practicable. With respect to the compulsory notification of infectious diseases and hospital accommodation in Hull, they had no compulsory notification of infectious diseases; but they had provided one of the most efficient hospitals; and at the present time they isolated more than any large town in England without compulsory measure, and possibly had as many patients in their hospital as some large towns possessed of compulsory powers. His opinion was that those hospitals for infectious diseases, if they were to become as popular as they might be, should, as was the case in Bolton, be free for rich and poor alike.

Dr. C. MACFIE (Bolton), remarked that as a medical man belonging to Bolton, it would be as well for him to give an expression of the general opinion as to the application of the notification of the infectious diseases clauses of the Improvement Act in Bolton, especially as they affected the medical profession in the town. Dr. Sergeant said in his paper that the majority were in favour of the notification of infectious diseases. He thought all the medical men would agree to that, but as Dr. Carpenter had said, it should not be the medical man who was called on to report the secrets of his patients. Prof. Corfield had said it was a matter of sentiment. Perhaps it was. Many said the present state of affairs in Ireland was due to sentiment; but it was there, and there was something more than sentiment in it. Still, until the country saw its way to a better plan for reporting the cases other than we have at present, they, as medical men, would have to bow to it. Dr. Sergeant had said that with a small hospital and the prompt reporting of infectious cases, an epidemic of scarlet fever could be checked in the bud. Well, they have had an epidemic of scarlet fever in Bolton for something like twelve months, so far as his memory served him. Personally, he had had cases of scarlet fever under him professionally for many months, so that this did not altogether bear out what Dr. Sergeant said as to checking the spread of the disease by carrying the patients away to the fever hospitals. He said that was quite right in cases where they could not be properly isolated, as Dr. Carpenter mentioned, and they found, as the Medical Officer for Salford said, that there might be exceptions. They found, too, that even the fever hospital was the means of spreading disease. In his own practice he had had two cases within the last two years where the fever hospital had, in his opinion, been the cause of spreading scarlet fever. The cases were immediately reported and were removed to the fever hospital. After the lapse of six weeks they returned home, and within three days scarlet fever appeared in the same house, showing, in his opinion, a want of thorough effectiveness even where cases were removed to the hospital. On the other hand, in all the cases of scarlet fever he had had under his care throughout the case, he had not had one case of another member of the family having been affected. He had had a good many of these cases, but had of course always taken care to secure complete isolation. But there was

another difficulty: very often in the dirtiest cases, and those in which it was most difficult to get isolation at all, they found that the friends of the patient would not send for the medical man under any ordinary circumstances, because they knew that as soon as the case was reported it would be removed to the hospital; and they knew also they would have the sanitary inspector—not Dr. Sergeant, except it were from his office—down upon them. And the inspectors, in the case of Bolton, did not try to explain to and persuade the people that all was for their benefit. They were too imperious, and there was the sense that they were forcing the law down their throats. Then occasionally they found that in some streets where they were attending they would be assailed with “how is it so-and-so a few doors off have scarlet fever and they are not reported?” Enquiries have been made in such cases and the people have denied that the case was one of scarlet fever; and they have acted so, simply because the law was forced down their throats. He said let the law be applied with some consideration for the feelings and opinions of the medical practitioners affected as it was done in York and in Salford; and he was sure the act would be carried out as heartily in Bolton as it was there. The act had been enforced under very considerable feeling, partly because the medical men had to report, and to report under penalty. Dr. Sergeant mentioned that there were other causes tending to the spread of diseases, and from his own knowledge of Bolton he must say that the open ashpits could not be sufficiently condemned. They were a great source of disease in Bolton, and they had a system of allowing the ashpits to run from the beginning of the summer until the end before they were emptied. He had known many cases of choleraic diarrhœa occur where the ashpit had been emptied say two or three days before, and he could not help thinking a great move would have been made in the direction of preventing those epidemics of fever as well as diarrhœa if those ashpits were dealt with. In this connection he would ask that as the members were visiting various places of interest in the town, the scavenging committee would see that they had an opportunity of visiting one of those back streets after the ashpits had been emptied, and he thought they would find they had plenty of foci for the creation of disease. In the same way as there were factors tending to germinate disease, so there were a great many other causes preventing the spread of disease other than notification or the establishment of a fever hospital. They knew for example what great improvements had been made in the town; they knew what great improvements had been made in the country—so much so that it had been said to have added five years—some say 13 years—to the average duration of human life. So that he thought that in considering the sanitation of a town as Dr. Sergeant had done in his able paper, he ought in order to have put his conclusions in a proper light, to have detailed what had been done in the Borough outside the fever hospital, and outside the reporting of infectious diseases, and to have compared his conclusions with the effects of sanitation in other similar towns without notification clauses in their sanitary laws.

Mr. S. W. NORTH (York) observed that he had ventured to move the adjournment of the discussion because he thought it was not well that the observations which Dr. Carpenter had made on the subject of notification should go forth as the sole expression of the views of that conference. He should have dealt with it before if he had thought it to be relevant; Dr. Carpenter had urged that day as he had urged on many previous occasions, his objection to the notification of infectious diseases being enforced on medical men, and had sketched some plan by which he expected that the person suffering or the occupant of the house in which the patient resided, should himself notify the disease. He took it at all events that Dr. Carpenter's objection was to compulsory notification by medical men, and he expected that it would be carried out better if the duty were reposed on the occupier or patient himself, rather than the medical practitioner. With all that Dr. Carpenter had said in his desire to protect the medical profession, he trusted there was no member of the profession more anxious than he to protect their rights; but he was bound to say that if notification was required for the public good, and if it were one of the things requisite for the safety of the people, there was no method which to his mind offered the slightest satisfaction except compulsory notification by the medical man in attendance. As Dr. Carpenter was aware, in the clause adopted as a result of the recommendations of Mr. Selater Booth's Commission the notification was dual; and what was the experience on that point? During more than three years in which notification had been in operation in York he had never received a single notice from a householder, whilst as to notices from the medical profession they had come in with unvarying regularity, punctuality and accuracy. But the opportunities for evasion on the part of the householder were so enormous that he confessed himself astonished that anybody should rely solely on the householder for notification, or that they should rely on that round-about method by which a medical man should be bound to give a printed form to the patient, and that the patient should be bound to send it to the sanitary authority. It seemed to him better and more straightforward that medical men should send it to the sanitary authority, and if the law imposed upon him that duty, the injustice was not on his part if there was any, but on the part of the law. So with the notification of disease as with the certifying of vaccination he might fairly say, “I do not like this but it is imposed upon me, and as a good citizen I am bound to obey it.” And when the medical man did this he disclosed no secret voluntarily any more than did a witness who gave evidence on oath before a court of law. It was most important that this notification should be accurate and reliable; it was indeed vital that it should be so. If it were not, the character of a town might be taken away by the notification of cases which did not exist. No reliance could be placed on the notification of a householder who would always have this excuse that it was unjust to expect him to know the nature of the disease. Then the diagnosis of these cases was by no means so clear as some of them could desire. After forty years experience he frequently came across cases of

infectious disease about which he had considerable doubt, and that which occurred to him must occur to a very large number of practitioners. Well if the medical profession felt doubt now and then as to the diagnosis of some case reported, how much more so must it be in the case of a householder? Let them look at the wide door which would be opened to the neglect of sending these notices. It was all very well to say this was a duty enjoined by the law and so forth; they knew as a matter of fact that amongst the large masses of the poor, and amongst large numbers of those who were not poor, those sort of duties were as a result indifferently performed. Why, these people neglected very often to send for medical advice until it was too late to do much good; in fact in all the social relations of life there were large numbers of them who grievously neglected to do their duty. From the highest to the lowest there was an unwillingness to discharge a duty which they did not like. What a figure they would cut in a police court if a poor woman were summoned for not having notified a case; she would say "I thowt nowt about it; it was nowt but a rash. Bairns will hae rashes, the hae had them afore and will hae them agen"; and would Dr. Carpenter tell them that a magistrate would dare to convict a person saying she did not know there was anything to report or what to do if there were? Let them remember that all this was now written in the local law. It was plainly stated that every householder should notify to the sanitary authority the existence of any infectious disease, and yet in three years he had not received a single notice from anyone except in the medical profession. He said if it were the desire of the medical profession as he believed it was, to do the best they could that men should live happily and pleasantly, and enjoy to the full their length of days, then he said they were discharging a most important and highly honourable duty in giving information to the sanitary authority of the existence of those diseases so that the sanitary authority might do its duty in time and assist them in taking care of the people under their control. The earnest desire of the profession in endeavouring to promote the health of the people is that of which they might be justly proud; without this spirit on the part of the medical profession, sanitary work would soon cease to be the principal agent for good it now was, and none could hope for a brighter future which they expected the advance of sanitary science would give.

Dr. EDWARD SERGEANT (Bolton), in replying on the discussion as a whole, said the matters mentioned in his paper had been very carefully considered, and he was sure it would be exceedingly profitable to them as a Corporation to accept the opinions expressed by the gentleman they had listened to that day. He was himself exceedingly obliged to Professor Corfield, Dr. North, Dr. Carpenter, and Dr. Tatham, and the other gentlemen who had spoken. As to notification, which had given rise to so much discussion, the principle was he thought, accepted by all sanitarians. The mode of carrying it out however, was always a difficult problem to solve. In 1877

when they in Bolton obtained powers, they had that dual responsibility imposed on the medical man and also on the householder; in 1879 they reconsidered the subject, and one of the questions they reconsidered was the question of reporting. From 1877 to 1879 they had a certain amount of friction, and they were anxious to do away with this as much as possible; consequently they desired that the responsibility should be taken from the medical man and placed on the householder; but a meeting of medical men was held, and they received a letter from the secretary Dr. Macfie, who had spoken that morning stating that the medical men would prefer to report themselves, as they thought that by so doing the certificate would "be more likely to reach the Town Hall, and would not run the risk of being destroyed or lost." He was sorry Dr. Macfie who had penned those words was not there as he might have given an explanation. Well, in order to keep faith with those gentlemen, they continued that dual method, and so far as he could see it was the best method; although the act had been in operation ten years they had only had to prosecute in one case. That was an instance where a small-pox patient was kept in a butcher's shop; the patient had been suffering for he thought something like two days. The neighbours suspecting what was the matter owing to the doctor calling, were alarmed; the authorities visited the case and found it was a very acute attack of small-pox, and the butchering business had been carried on during that time. He thought most sanitary authorities would have considered that was a clear case which should be taken in hand; and it was, with the result that they obtained a conviction. That was the only case, and it was furthest from their desire to have any conflict at all; he thought they got on fairly satisfactorily. There was this about dual reporting:—it took away from the medical man any idea that he was violating the privacy of his patient since he was simply performing the duty which his patient or his patient's friends were equally responsible for carrying out. As a matter of fact they rarely exacted a notice from the householder, being satisfied with the testimony of the medical attendant, who therefore assumed a double responsibility. Their opinion was the same as Dr. North's. They very, very seldom got a certificate from a householder, it being generally understood that the medical man would attend to all the reporting; he did not think they had had a certificate from a householder for two years. To adopt Dr. Carpenter's suggestion as to notification it might be necessary to place the medical attendant in the witness box to prove that he communicated to the proper persons the fact that the case was infectious. This course would multiply the difficulties attending notification so as to be manifestly unfair to the medical man. As to the works at Wellington Yard, the material burnt in the destructors was material which had no manurial value; it was rubbish which was quite useless, but which might have become contaminated and offensive owing to having been placed in ashpits. It consisted of vegetable refuse, broken pots, and a lot of rubbish of that kind; so he did not think they were destroying what ought to be placed on the land.

The President, Professor J. RUSSELL REYNOLDS, said that if Dr. A. Carpenter wished to say anything on the subject they would be pleased to hear him.

Dr. ALFRED CARPENTER (Croydon), said it seemed to him much better that they should prove to the public at large the advantages of the adoption of measures they as sanitarians proposed, rather than they should get the law to say "you must do this and you shall do that." He knew it helped a medical officer to have the power of saying "you must do it, the law says you shall"; it made the thing go on to some extent very easily; but he asserted this that neither Mr. North, Dr. Sergeant, Dr. Tatham, nor any other medical officer could ever say that they had all the cases reported to them. Whilst the fact was made manifest at this Congress that a large percentage of cases were not attended by any medical man at all, yet there was no attempt made to make the people do their duty of notifying; indeed the eye of the official was shut at the flagrant neglect of duty on the part of the people. Instead of which it should be brought home to them that they owed a duty to their neighbours which they ought in all cases to perform either by themselves or by their agent. Thus the knowledge of preventive medicine would be popularised; instead of as now by the dual notification, the public are made to believe that they have nothing to do with notification.

The President, Professor J. RUSSELL REYNOLDS, thanked Dr. Sergeant in the name of the section for his paper.

"Remarks on the History and Progress of Public Health," by
JOHN LIVY, M.D.

THE Council of this Borough have exercised a wise discretion in inviting the Sanitary Institute to hold its Annual Congress here, and I have no doubt that as a direct result we shall make more rapid progress in the diffusion of the knowledge of the laws which govern health and longevity. It requires a considerable time to instil new facts and doctrines into the public mind, and a still longer period before knowledge takes the form of action and legislation. I am however firmly convinced that sanitary legislation will do little service to the country, unless it be the real embodiment of public opinion. I am not sure whether we have not had enough of Law.

Legislation cannot do everything. It cannot make men sober. It cannot abolish poverty, that were too utopian, but it can minimize many of the evils that poverty and drunkenness entail. Hence the value of these voluntary associations.

Mankind have in all ages considered health as the greatest blessing, and have striven, according to their lights to preserve it. The value of pure air, pure water, unadulterated food, and suitable clothing, and in a word absolute cleanliness has been more or less appreciated from time immemorial.

Hippocrates, B.C. 460, the most celebrated physician of antiquity, and styled the Father of Medicine, in his writings discourses freely on their importance, but Moses was perhaps the most practical of all sanitary reformers. He was learned in the wisdom of the Egyptians who were well-known sanitarians. One of the Egyptian commandments not included in the Decalogue was, "Thou shalt not pollute rivers." Moses gave us the principle of the earth-closet, and rules for the isolation of sickness and the disinfection of excreta. We have at this late period only commenced to build hospitals for that purpose and with the happiest results, but so slow has been our progress that we have deferred this inestimable boon to the latter part of the nineteenth century. Indeed the Mosaic Law gives perhaps the best summary of the rules of health to be found among ancient writers.

Considering the absence of the sciences of chemistry, physics, and geology, the Hindoos, Greeks, and Romans, as well as the Mahomedans in their teachings in regard to health were remarkable, although necessarily empirical. According to Strabo, B.C. 50, the streets of Rome were only from 5 ft. 9 in. to 7 ft. 10 in. in width, whilst in order to exclude the sun's rays, the height of buildings varied from 55 ft. to 65 ft. Augustus fixed them at 65, but according to Strabo, Nero reduced them to fifty five.

In climates such as our own, humidity is our great enemy, so that our streets should be wide and straight and the houses comparatively low. They ought also to bear some relation to the prevailing winds and lie parallel with them. Instead of which, in order to enhance the profits of the landlord and the jerry builder, we constantly see rows of houses placed at right angles to each other so as effectually to block healthy ventilation.

The sacred history of the Jews contains references to five famines and ten plagues, and the history of Rome, before the Christian era, to thirty-two plagues. The early history of Greece, too, bears evidence of plague and pestilence.

The plague of Athens, B.C. 428, was one of these, and is the modern plague of England, namely, scarlet fever. In the early

centuries of the present era, we have notices of many plagues among all the nations of which we possess any historic records, and the whole Roman Empire was devastated by mortal epidemics in the second and third centuries, and by the Egyptian plague twice about the middle of the sixth century.

Historians of repute have attributed the decline and fall of the Roman Empire to the pestilences which swept off the adult male population and left the then mistress of the world an easy prey to the Goths and Vandals.

The black death continued its ravages in this country up to the middle of the fourteenth century. Until that time no age or country seems to have been free from severe epidemics.

The plague at Eyam, near the Peak in Derbyshire, is a remarkable instance of an epidemic. It lasted thirteen months, 1665-6. It attacked seventy-six families, and swept away 267 out of about 350 inhabitants, viz., seven out of every nine. It was introduced into the village by one George Vicars, a tailor, who, when the plague was at its worst in London, received a box of clothes from that city. He opened the box and hung the clothes to the fire, and while he watched them was suddenly seized with violent sickness and other alarming symptoms; on the second day he was delirious and large swellings appeared in the neck and groin; on the third day the plague spot was on his breast, and he died on the following night, the 6th of September, 1665. Towards the end of June, 1666, the plague began to rage even more fearfully. There were so many deaths that the passing bell was no longer rung, the churchyard was no longer used for interment, and the church door was closed. The rector, the brave and ever memorable Mompesson, read prayers and preached from an arch in an ivy-mantled rock in a secluded dingle to his people seated on the grass at some distance from each other. All this time, though Mompesson had been visiting from house to house, he and his wife had escaped, but on the 22nd of August, Mrs. Mompesson was seized, and three days after was at rest in the village churchyard. In this terrible month of August, 1666, there were not less than seventy-seven deaths out of a population of less than 200 remaining at the beginning of the month. At least two in five must have died.

According to the somewhat gossiping Diary of Samuel Pepys, the mortality in the City of London reached a total of 7496 in the week ending 31st August, 1665, of whom 6102 died of the Plague. "But," he adds, "it is feared the true number is 10,000, partly from the poor that cannot be taken notice of through the greatness of their number."

In the middle of the fourteenth century this same plague,

under the name of the "Black Death," is computed to have carried off from a fourth to a third of all the inhabitants of Europe.

In London in 1665 it was fatal to 68,596 persons out of a population amounting at the time to half-a-million. The death-rate of London from 1660 to 1679 was no less than eighty per 1000.

LONDON MORTALITY.

1660—1679	... ..	80.0 per 1000.
1681—1690	.....	42.1 "
1746—1755	35.5 "
1846—1855	24.9 "
1871	22.6 "
1876—1886	21.3 "

RURAL ENGLAND.

1876—1886	17.9 per 1000.
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URBAN ENGLAND.

1876—1886	21.2 per 1000.
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In 1870 the Education Act came into operation in this country, and children were for a portion of the day taken out of the close alleys in which they lived, and placed in lofty well ventilated schools, where they could breathe a purer air. The result in London alone was that, according to the tables of the Registrar-General, the mortality of children between the ages of five and ten was decreased thirty per cent., of children between ten and fifteen years was reduced thirty-two per cent., and of those between fifteen and twenty years of age thirty per cent. These results show not only the evils of overcrowding, but also how they can be abated.

The laws of health are most needed where men congregate the most—in our large towns; and their importance increases in a ratio with the number of people living in the same place.

One of the greatest of all sanitary defects is overcrowding. This evil is no new discovery, and legislation upon it is very old. The first and most efficient legislation on the subject was in the time of Elizabeth. She was so startled by the miserable state of the dwellings in London, that she enjoined in her usual high-handed manner that no building within three miles of London or Westminster should be divided into tenements where families might congregate. But long after her reign the tenements of the poor were very wretched. The dwellings of a London workman had no glass windows, no coal fires, and the people slept on straw beds.

Great improvements have taken place in the condition of the working classes since, but rents having risen by 150 per cent. the houses have not improved with the general prosperity of the country.

The mean duration of human life during the present reign has advanced $3\frac{1}{2}$ years.

The services of paid union officers save the country three millions annually.

In France the death-rate is three per cent. higher than in England, which means the loss of 112,000 lives more than in this country.

In Germany, with a mortality in the army the lowest in Europe, the death-rate of the civil population is 6, in Italy 8, and in Austria 11 per thousand higher than here, which means in Germany a sacrifice of 130,000 lives yearly more than in England, and in Italy and Austria 600,000 lives every year over and above the corresponding waste of life in England and Wales.

In an address recently presented to Her Majesty the Queen, by the Association of Public Sanitary Inspectors, the following statements appear:—

“With as yet very rudimentary and imperfect executive arrangements, the general health of your subjects has been far advanced beyond that of any great State of Europe, or the United States of America; that the mean duration of life of all your subjects has already been augmented by three years and a half; that on the last year's population of England and Wales there has been a saving of 84,000 cases of deaths, and of more than one million seven hundred thousand cases of sickness over the average rates of death, and the average sickness rates since the commencement of Your Majesty's reign; that instances of general application have been presented of reductions of the death-rate of the civil population by one-third and one-half; that by more complete application of our science the death-rate of your home army has been reduced by more than one-half, and of your Indian army by more than four-fifths, and that these experiences are available for the whole of the civil population of your Empire, that particular and decided examples have been achieved by the practical application of sanitary science as displayed in district half-time schools, and and by which far greater reductions of the present excessive infantile death-rate may be accomplished.”

The massing of the population under good sanitary conditions as opposed to overcrowding, is not incompatible with health as is shown by the Peabody and in Sir Sidney Waterlow's buildings. These houses can be built to render a fair return for the outlay,

and at the same time reduce the death-rate to 16 or 18 per 1,000 or less than the present country death-rate.

A century ago the death-toll throughout Europe was 34 per 1,000, whilst now it has fallen to 22.

In one of the communes of Corrèze, the mortality from 1775 to 1790 was at the rate of 41 to the 1,000, but has now fallen to 24 per 1,000. Similar facts are recorded in Sweden, where the rate has fallen from 28 to 17 per 1,000.

The death-rate at Milan in 1740 stood at 41 per 1,000, it is now 28. At Rome it has fallen from 39 at the beginning of the century to 28 at the present day.

As every death represents perhaps 20 or more cases of sickness, the question is not one merely of mortality. I consider that the civilizing influence of good houses is even greater than their effects upon health.

The unfortunate misconception of the nature and treatment of disease which followed the spread of Christianity in Western Europe, clung to the belief that plague, pestilence, and famine, were divine judgments and ought not to be interfered with by any human agency. They forgot that there is more of mercy than of wrath in all divine arrangements. Undoubtedly epidemics are warnings that sanitary laws are being infringed. Now a God of wrath and pestilence is the God of the Heathen, not of the Christian. It is by disobedience and neglect of natural laws, arranged with supreme beneficence, for our well-being, and not for our destruction that we are mercilessly punished. This misconception has not only retarded the development of rational, but has led to a similar neglect of preventive medicine.

Much of the improvement we observe to-day as compared with the state of affairs in former times, is due to the lives saved from small-pox by vaccination, and by the better sanitary management of hospitals and maternity Institutions. From researches made by Signor Luigi Bodio, similar conclusions may be deduced. In the period 1866 to 1870 of the Italian Conscripts, 36 per cent. were refused for physical defects. In 1881 to 1884 the rate fell to 20 per cent.

M. Charles Monod has estimated that 70,000 lives are saved annually by the agency of our Local Government Board.

Whilst some of the figures may be liable to criticism, there can be no doubt as to the main facts. The Laws of Hygiene are now better understood both by individuals and communities, and however far we are yet from an ideal state, the value of good sanitary surroundings and temperate living is now more generally recognised.

Any one who has visited the ruins of Pompeii and Hercu-

laneum, or even seen photographs of these cities, will at once perceive that in comparison with the houses of the people at that time we may be said to be living in spacious palaces. Almost every one is now on the whole far better housed than at any former period.

Of all the practical sciences Public Health is that which has progressed the most rapidly during these last fifty years, and its progress is in some degree explained by the great importance of its aims and by the certainty with which it attains them. It entirely responds to the aspirations of our time. "Sanitas Sanitatum, Omnia Sanitas," has been in an increasing degree the watchword for that period. In what may be called the centuries of faith, humanity, with its looks turned towards the skies, walked its way regardless of the things of earth. The people lived and died in the most miserable and filthy dwellings.

At a later period, when the disdain of material interests began to abandon them, and when religious fervour was somewhat abated, they began to aspire after freedom and riches.

The taste for the comforts and amenities of life came later. It insinuates itself in societies as the level of the creeds is lowered and that of riches is elevated. Afterwards the care of the future life and that of riches passes into the second rank; the desire of enjoying health and of dying at the latest possible period are placed in the first line. I do not mean to say that the care of health is incompatible with elevation of thought or the highest aspirations of the soul. The contrary is the truth.

Hygiene teaches those who listen to it neither the worship of riches nor the taste for material enjoyments. It inspires them with the love of labour and of family. It teaches men to bring up their children in view of the duties that they will have to fulfil and the sacrifices that their country may require of them. It shows them the road to follow in order to make the rising generations healthy and robust, because their moral and intellectual progress is at this price.

If, occasionally, a person of genius is found in a frail or a deformed body, it is accidental. Strength of will, kindness of heart, and the more austere virtues are the habitual companions of health and strength. If it is good to have known misfortune in order to have pity upon others, if it is true that people only feel for those evils that they themselves have suffered or which they dread, still misery and pain are bad counsellors. They choke the intelligence and contract the heart. Suffering makes men revolt and become selfish, whilst prosperity makes them charitable.

The services that Hygiene renders are so much more appreciated as they are evident and palpable.

The cure of diseases by remedies has its unbelievers, but Hygiene has none. Her language is intelligible to every enlightened mind. She imposes no sacrifices in exchange for the services she renders. The companion of decency and comfort, she marches in line with them.

The expenditure she necessitates is money well invested, for there is nothing so costly as sickness, if it is not death; and all that is spent in procuring health turns out to be a realized economy.

One of the main elements of happiness is health. It is the possession of no class or rank, and may bless the pauper whilst it is denied to the monarch. Compared to health all the luxuries of wealth and all the trappings of pomp are as nothing. Shakespeare truly says in *Henry V.* of the poor hind who "like a lackey from the rise to set, sweats in the eye of Phœbus, all night sleeps in Elysium." The sleep that he has earned outweighs the riches of a king.

I cannot conclude these few remarks without adding my humble tribute to the self-denying labours of the late Dr. Farr and Dr. Parkes, and many others still living; and last, but not least, to the renowned Pasteur, whose lifelong exertions in various paths of medical research have conferred lasting benefits upon humanity, and added a bright halo of glory to their own revered names.

Dr. J. F. J. SYKES (London), observed that Dr. Livy had brought out a rather important point in his excellent "History of Medicine." He gave them the fact that medicine was originally an attribute of the priest, and the physician was an after creation. Now the duty of a priest was not only to cure his flock, but his much greater function was the prevention of spiritual disease. Just in the same way the physician had a greater function than curative medicine. He had the function of prevention, and it seemed to him that from time immemorial it had been the duty of the physician to prevent the individual, the family, the community, from running into disease. They recognized the fact that it was the physician's duty to take upon himself certain state functions. They recognized this in their legislature, in their hospitals, both of curative and preventive medicine. The physician had a state trust as well as an individual trust; he was not only the physician to individual patients, but also had charge of the interests of the whole community whilst ministering to one member of it.

Professor J. RUSSELL REYNOLDS, M.D., F.R.S. (London), said he thought a paper so learned and so interesting was deserving of all

the thanks which a meeting of that Congress could give. Much of it was out of the ordinary line of thought, and there was much within that line, so that it had a double value. He was quite sure the members of the Association would be happy in expressing their thanks to Dr. Livi for his exceedingly interesting paper.

Dr. ALFRED CARPENTER, (Croydon), asked Dr. Sykes whether this country, or whether the church, or whether any denomination or set of ministers, would for one moment agree to the principle that when one of their flock became the subject of some vice, or did something which was opposed to the law of the land, it was any part of their duty to notify that to the state? He thought that at once took out the sting from Dr. Sykes' remarks concerning the compulsory notification of infectious diseases as to it being the duty of the clergyman and the doctor to make known the delinquencies of their friends and employers.

On "Our Pioneers," by ALFRED CARPENTER, M.D., C.S.S.
Camb.

THE position of the Sanitary Institute towards those who have laid the foundation of progressive sanitary work in this country, may very well engage our attention for a short time during this Congress. It is important for us not to lose sight of the object for which these Congresses are held, and the principle which underlies our actual position. We are enrolled as a Sanitary Institute, for the purpose of popularising a knowledge which must be sound, progressive, and especially that which is actually useful to those who are at work in developing sanitation as a science in different localities. We obtain the facts upon which the edifice as a scientific building should be reared, from experience rather than from theory: but before satisfactory experience can be gained, theory must be promulgated and supported by some kinds of facts, in some cases they may be assumed, in others they have been only observed by a limited number of persons, indeed, sometimes consisting of a single individual.

Fifty years ago sanitary observers could be counted upon the fingers' ends. Their writings remain among us to shew the truthfulness of their observations: some of their works, it is true, are based upon ancient doctrine. The exactness of the deductions

which they made from what they saw, and what they guessed at, can be proved by the experience of the present day. The earliest of our 19th century pioneers have passed away, comparatively unrecognised by the State, and uncared for by the country at large; but they are venerated by those men who have assisted to found the Sanitary Institute, and its necessary colleague, The Parkes Museum. Some, like Chadwick, Simon and Rawlinson, still live to see the results of their labours established upon a firm basis, which becomes all the stronger the more it is examined by the aid of our present advances; others are not now with us in the flesh on this earth, but their mantle is here.

I am led to make these introductory remarks in consequence of the action which has been initiated by the Council of the Institute. They published an abstract of the works of Dr. W. Farr, on "Vital Statistics," in the year 1885. The volume contains a mass of facts which must assist the earnest Sanitarian in all future ages. I am not about to quote from that work, it was well reviewed by your then Chairman of Council, Sir D. Galton, at the last Congress. I hope it is, or will be possessed by all enquirers into sanitary statistics, and especially by the Members of this Congress, but I wish to draw your attention now more especially to the sequence of that work.

The Institute is founded principally for the purpose of popularising sanitary knowledge, to bring its fundamental principles within the reach of the public, as well as to stamp those who presume to act as experts with a stamp which indicates the genuineness of their presumption. The publication of Dr. Farr's works was the result of a suggestion made at the Glasgow Congress in 1883, by Dr. Gairdner. I made it my duty to take up that suggestion, and urge its applicability and the advantages to be obtained from it, upon the council. The sequence of our work was the appearance of the volume and its significant approval by sanitarians in all countries. The council perceived that they should not rest satisfied with an issue of Farr's works alone, and looking over the history of the past, it was impossible for them to shut their eyes to a demand for a continuance in the same path.

It appeared to them that John Simon's writings had assisted to promote true sanitary work, without the actual author being recognised in his true light. They changed the name of the committee to whom was entrusted the publication of Farr's Works, from that of the "Farr Committee," to that of the "Sanitary Publications Committee," and instructed them to bring out an abstract of John Simon's Works provided J. Simon would assist, and approve of the project. This action is a new departure upon a road not at first recognised as suitable for the

council to take, but which events point out as a proper one to be followed in the future. My object in reading this paper is to present the two volumes to your notice which have just been issued from the office of the Institute, and to ask the members of this Congress to carefully read them from beginning to end.

Dr. Farr's Works were compiled from dry statistical records, and are more fitted for consultation as works of reference, and for careful annotation and mental notes than for general reading. John Simon's are readable by the general public, and capable of being understood by the simplest intellect. His reports to the City of London commenced in 1849, dealing with questions of house drainage and cesspool abominations which then existed in the city; the dwellings of the poor; overcrowding; preservation of open spaces; offensive and injurious trades; smoke nuisance; intra-mural interments; a review of the general work of Sanitary Inspectors are all dealt with in a spirit of freshness and vigour which surprises me, even to-day on re-reading them again, though they directed me to sanitary work thirty-seven years ago, when I had the privilege of acting as Mr. Simon's dresser in St. Thomas' Hospital, and of reading his reports in the columns of a London Daily Paper.

Since that time intra-mural interments have ceased, though at the time named more than 2,000 dead bodies were annually interred within the precincts of the City of London, and the whole place was then riddled with cesspools. Smithfield and all its horrors has also disappeared, slaughtering of cattle is illegal, and no longer takes place in the city. Overcrowding is diminished, but it still exists to a serious extent; cisterns are still in use for the supply of water, though a constant supply was insisted upon by their accomplished medical officer of health in 1853; and though the common right of the neighbourhood to breathe uncontaminated atmosphere was urged upon the local authority of that day in incontrovertible terms, it still continues to be contaminated in various ways but too evident to the senses. The strongest Corporation in the world has not been able to put a stop to the smoke nuisance, to intermittent water supply, or to stinking sewers. True the atmosphere of the City of London, except when invaded by smoke from the desert of houses which surround it, may compare very favourably with Bolton, because the chimney-shafts of manufactories do not defile the air as they still do in this part of the kingdom. The smoke from private chimneys is, however, rapidly tending to produce smoke fogs in some parts of the Metropolis, every day in the year according as the wind veres from one point of the compass to the other. Mr. Simon deals with private fire-places in a way that shows the great power of observation which he possessed in 1850 as

well as now. It would be impossible for me in the short time at my disposal to do more than to urge you all to read and digest these remarkable reports, and I may then ask whether public education has really advanced as rapidly as we are giving ourselves credit for. The abominations which existed in the City of London in 1849, continue to exist more or less in many of our smaller towns as well as in some of our large ones. Cesspools; contaminated water supplies; the pollution of the atmosphere by wasted fuel, continue to make their annual tribute to the death roll of the country, in spite of the work which sanitarians are striving to accomplish.

To me, the reading of John Simon's reports is like to the reading of a chapter in history or of some sensational romance; they commend themselves to me for their clearness of expression, and for their striking simplicity, which enabled the City Commissioners to easily grasp some of the most difficult problems of their work, and to do the best they could to educate a changing population like to that which the city always possesses. They have done something, but the most difficult part of their work, viz., the overthrow of vested rights has defied their power, and smoke continues to sit upon the Metropolis like a pall. The smoke nuisance in London as well as in all our manufacturing towns, is a proof that commerce is stronger in its entanglements than is the demand for safety to life.

Mr. Simon also deals with the prophylactic measures to be taken against the invasion of cholera in a masterly style, which shows the firmness of the foundation upon which he worked. Let me read you a short extract as to the specific causation of cholera, written in 1853.

He says: "But, deeply impressed as I am with the importance of these considerations, I esteem it of still higher consequence if measures are ever to be taken for an effective prevention of the disease, that the principle of its *specific* causation, should be steadfastly kept in view. What may be the exact chemistry of this process, I do not pretend to say, urging only that, in all human probability, the poison arises in specific changes impressed by some *migratory agent* upon certain refuse-elements of life. Perhaps, nowhere, and certainly not before your Hon. Court, can it be desirable, in the present immaturity of pathological knowledge, to argue as to the first origin or absolute nature of that wandering influence which determines in particular localities the generation of epidemic malaria. Simply, since it leads to all-important practical conclusions, let this distinction be recognised: that which seems to have come to us from the East is not itself a poison, so much as it is a test and touchstone of poison. Whatever in its nature it may be, this

at least we know of its operation. Past millions of scattered population it moves innocuous. Through the unpolluted atmosphere of cleanly districts, it migrates silently, without a blow; that which it can kindle into poison, lies not there. To the foul, damp breath of low-lying cities, it comes like a spark to powder. Here is contained that which it can swiftly make destructive—soaked into soil, stagnant in water, griming the pavement, tainting the air—the slow rottenness of unremoved excrement, to which the first contact of this foreign ferment brings the occasion of changing into new and more deadly combinations.”

We have not advanced much upon this, except to isolate the “migratory agent,” and prove the truth of all else advanced in the above doctrine.

Let me make another extract from the same Report. Mr. Simon says to his Court (p. 117, vol. I.): “You will excuse me, I hope, in consideration of the anxieties of my office, if I seem superfluously cautious in reminding you that the test of successful sewers lies in an inodorous fulfilment of their duty, and that every complaint of offensive emanations indicates, in proportion to its extent, a failure of that sanitary object (viz., the removal of excreta) for which the construction was designed.”

Go where we will we hear complaints of smells from sewer gratings, from sewer ventilators, from sewer junctions. The sanitary doctors are tinkering away in trying to remove the smell in every town, notably that in which I reside. Thousands of pounds are being spent in trying to remove the effects of an evil which ought not to exist at all, and when it does exist informs us that the constructing engineer has failed to recognise the teaching conveyed in Mr. Simon's Report of 1853, and has not understood the fundamental principle conveyed in the fact that the sewer must be *inodorous* to be successful. So long as they continue to allow of deposit in any part of their course, they are failing in their duty and reflecting upon the ability of those who constructed them. Engineers may rebel at this doctrine, but it is nevertheless the basis of all true sewer work, and Mr. Simon's views should be the view of all of us.

The antagonism to vaccination which is rising among our people from the innate love of liberty which belongs to the Anglo-Saxon and the Scandinavian races, and their detestation of coercion in any form, unless that coercion coincides with their ideas of justice, is likely to give some trouble to sanitary authorities. The publication of Mr. Simon's reports to the Local Government Board, on “The History and Practice of Vaccination,” carried up to the year 1871, comes in very op-

portunately at this present time. The reports are readable by the general public, they are written in simple language, they are convincing to the unprejudiced enquirer, and they are now published most opportunely in a form which will place them within the reach of every sanitary authority in the kingdom, whilst the blue books in which they first appeared are scarcely accessible, and many are out of print. If every local authority were to subscribe for the work, and place it at the disposal of the Members of the Sanitary Committee and their Medical Officers of Health, they would make a satisfactory investment and have the facts before them upon which our adhesion to vaccination is based, in a way which cannot be controverted. The report occupies 246 pages of the first volume, and should be read by all sanitary workers, and when possible its deductions should be published in all districts in which objections to vaccination are at this time being used, either for political purposes or personal advantage, or to serve the purposes of personal vanity.

The report upon the sanitary state of the people of England, written in 1858, is like to reading some exciting romance. In that report Mr. Simon clearly proves that “The local excesses of fatality are due to local circumstances of aggravation. That those aggravating local circumstances are such as it is fully possible to counteract, and of the total mortality ascribed to their influence, a large share is preventable.” The simple meaning of that sentence, which I regard as an axiom of sanitary Euclid is, that in any district, whether it be in Bolton, or anywhere else, if the mortality is considerably above the death-rate elsewhere, there is defect of administration, and neglect of duty which should be brought home to someone, and visited by that punishment which public opinion is capable of affording; a tribunal to which alone we have the power of appeal in such cases. But we ought not to be obliged to rest here. The higher mortality is made up of a number of single figures, some of them are induced by a low state of health, for which the local authority is responsible, but others are clearly due to sanitary defects in the home of the deceased person. The work of Simon, and others of his stamp, has proved that such deaths need not occur. The local authority is quite aware of this fact, and I turn to the legal profession for a remedy. The right of action against railway companies has made the seat of a railway carriage the safest place in which it is possible to sit when travelling. I would give a right of action against every local authority when death has resulted from preventable disease, which has arisen in any given locality, and leave it to the latter to recover from the owner of the property if it should be shown

that there was neglect of duty on his part in not complying with the bye-laws of the district in which the property is situated.

But I am leaving the subject of my paper, which is a review of Mr. Simon's reports.

The second volume begins with reports to the Privy Council in 1859, upon the distribution of disease in England, and the circumstances by which it is occasioned, with special reference to diarrhoeal and diphtherial districts. As regards diarrhoea, he says: "it is not practicable to give any short analysis except, perhaps, by saying almost in a word that from first to last they constantly illustrate the preventability of diarrhoeal death." (Page 7.)

The excess of mortality from diarrhoea has in all places been coincident with the products of organic decomposition, especially of human excreta or the habitual drinking of impure water.

The report of 1860 has reference to lung diseases. He clearly proves that want of ventilation in in-door work-places gives rise to the presence of an atmosphere which specially irritates the lungs. Some businesses set up what are styled "industrial lung diseases," such as grinders and steel polishers, china scourers and potters, cotton carders and flax workers, miners, the unwholesome circumstances of domestic manufacture, such as those of straw plaiters, glove makers, lace makers, and silk workers, &c. Mr. Simon shews that industrial lung disease is preventable, and he asks in forcible language why preventive measures are not adopted.

Mr. Simon thinks that (page 51), "practically it seems certain " that an indefinitely long time must elapse before better results " can be brought about by agencies which are now in operation, " and that year after year as far forward as any present judgment " would unwillingly speculate, the same terrible waste of adult " life, must with no great mitigation continue unless the legis- " lature see fit to provide by special enactment, for more whole- " some conditions of labour."

This is a question which is now very much in the hands of the operatives themselves. If they would return as their representatives in the House of Commons earnest sanitarians, instead of men whose pecuniary interest is against sanitary expenditure, if they would send men like Simon himself, who would work for science sake, and not for the "Almighty Dollar" alone, the working man might see an end to the tribute now exacted by those whose principal consideration is the present profit upon the work done, and a return for the capital invested.

But I must not trespass further upon your time except to point out that you should insist upon your representatives

reading and carefully studying the facts brought forward by Mr. Simon in their various references to the social state of the people of England, as regards the character of their work, and the influence which their food has upon their physique, both bodily and mental.

The rise and fall of values in food is shewn, in other parts of the work, to be accompanied by rise and fall in mortality. A rise in the price of bread stuffs is followed by a rise in the death rate, and *vice versa*. Are we prepared as a nation to allow this rise to be effected by legislative means? Depend upon it, gentlemen, that when profit is purchased by blood, when money is made by the slaughter of innocent women and children, as well as by a death toll of bread winners, there will be a retribution upon those who cause it, just as at this moment retribution is falling upon the landowners of England for neglecting their duty to the poor of this land when bread was dear, and the agricultural value of land treble that which belongs to it now. They took their title in paying low wages, and allowing a high death rate to ravage the country. They neglected to provide healthy homes for their labourers, or to give them a healthy water supply, and now we have in many parts of the country land which cannot pay the expense of working and bear its ordinary burthens. We have an agricultural population whose only look out in old age is the workhouse, with the consequent high poor rate, and the flocking of the agricultural population into our manufacturing towns. Surely our landowners will be wise in time, and take measures to bring back the tillers of the soil to the soil which asks to be tilled, and in so doing, they must take the muzzle off the ox who is treading out the corn; that is, if Great Britain is to produce food for the people who live upon her shores. There is an intimate relation between the sanitary state of our bread winners and their families, and the soundness of our political system. Mr. Simon shews us in clear and unmistakable language that national vigour can only be obtained by preserving our national health, and national health is not at the present time in the most satisfactory state, and as a consequence national vigour is declining.

In conclusion, let me point out the enormous work which has been effected in this direction by a very small expenditure. Something less than £2,000 a year has been voted by various governments for experiment, research, and professional enquiry as to the incidence of disease, whilst many millions are being expended in life-destroying agencies. I urgently ask our economists to look favourably upon the expenditure in the former direction, as tending much more to the protection of the

country, by promoting health, than do the millions voted for warlike stores.

Nothing will convince my hearers upon this point so clearly as will the reading of Mr. Simon's reports. I pray you therefore to study them carefully, and to urge all students in sanitary learning to do the same.

Lord BASING, F.R.S. (London), thanked Dr. Carpenter for the eloquent address he had just delivered, and for the good feeling towards the population of the country which his closing remarks exhibited, and still more for the toil he had taken in bringing to their notice in an emphatic manner the admirable reports of Sir John Simon. As he stated last evening to the assembled Congress, Sir John Simon was one of the greatest benefactors this generation had witnessed. He thought Dr. Carpenter had been a little strong in some language he had used in the latter portion of his statement: especially was he unjust he thought in his remarks concerning employers of labour and of the agricultural classes in regard to the conditions of health they found around. It might be said he thought that the knowledge we now possessed upon these questions of public health had been brought about by experience within a comparatively small number of years. Overcrowding and diseases which followed the insanitary condition of our dwellings were not in existence at the time of the plague of London, at all events, not in the same way nor proceeding from the same causes. It was rather extraordinary that with the great number of diseases they had become acquainted with of late years the ravages of them had been comparatively trifling. They were worst in the dark ages, when the population was much more scant and scattered than now, and so free from some of the injurious conditions they now knew to be most rife in producing disease and death. He did not want to be over critical, but in the latter portion of Dr. Carpenter's remarks it was imputed that the agricultural labouring classes were suffering severely from the default of their employers in not providing proper dwellings for them. Far be it from him to deny that it was in many cases true, but he thought in justice it should be remarked, what gentlemen of experience in that room could confirm, viz., that the great majority of the land-owning classes of this kingdom had been for years engaged, and at no small sacrifice, in improving the houses in the villages around them. He considered that in the purlieus of villages and small towns in which labourers for the most part resided, and to which Dr. Carpenter's remarks were justly applicable, the dwellings were for the most part the property of small speculators, who were very fond of expending small sums of money in the erection of labourers' cottages. At all events, that was his own experience in the part of the country in

which he dwelt. Again, Dr. Carpenter seemed to point to the greed of the capitalist classes in extracting to the utmost what they could from the labourers whom they employed, without regard to their social and healthy condition. But he might say from his own experience that some of the most important manufacturers of the country were amongst the most urgent and foremost in pressing upon the government to which he belonged the necessity of works on sanitation. This spirit had been displayed by men interested in alkaline works; and the same might be said with regard to the Act he alluded to on the previous evening for the prevention of river pollution, which could not have been passed into law had it not been with the concurrence of a great number of those manufacturers whose trade and whose industry were undeniably to be interfered with if the legislation were to be put into immediate operation. Speaking generally, he thought they must admit that those who had been foremost in urging the necessity for sanitary legislation had not been so much the sufferers themselves, but rather the benevolent, intelligent, and wealthy employers who had seen the necessity of it. They must not, he thought, be too hasty in finding fault with this, that, or the other class of society, when they remembered that the whole of society had advanced in knowledge and experience to practical results, which they knew had taken place during the last twenty or thirty years. They certainly had a right, and the society was founded for that purpose, to lift up their voices in complaint against shortcomings wherever they could find them, and no one had done greater service in his day than Sir John Simon. He was courageous, unflinching, and determined; and those who were engaged in practical work for the benefit of mankind must know that without enthusiasm and determination a movement lost half its initial force, and so failed in bringing about the results which were desired. He thought Dr. Carpenter's paper would have the best results, as it would induce all of them to study the volumes he had referred to.

Professor HENRY ROBINSON, M.Inst.C.E. (London), expressed his pleasure at the interest which the meeting had evinced on the presentation of the two works referred to, having been associated with Dr. Carpenter on the committee to which the Institute had entrusted these publications. There was one part of the paper to which as an engineer he desired to refer, with the view of protesting against the statement that "engineers may rebel" at the doctrine that the sewer must not be the means of causing deposits or of creating smells. He was sure that every engineer in the room, or who read this, would concur in his protest, as every skilful and competent engineer was fully alive to these evils, and provided against their existence or continuance. There were cases where incompetent people were employed by parsimonious authorities to lay out sewerage works, and failure resulted with the consequent injury to health, but he would object to such people being called engineers in the sense in which the expression would read in the passage to which he had referred.

Mr. H. M. PAGE, M.D. (Redditch), expressed his obligations to Dr. Carpenter, one of their best known sanitarians, for the splendid address he had delivered that afternoon, especially that part of it which embodied the highest aims that hygiene had in view. It was a fact, however, that at the present day the attainment of those aims were in some sense utopian. For instance, Dr. Carpenter spoke of recovering compensation where it had been proved that disease was preventable. There was no remedy against the authorities in the present state of legislation for this. Speaking from his own experience of rural and small sanitary districts, he could say that one of the greatest defects of legislation and sanitation as they at present stood was that there existed no adequate supervision of the authorities of small districts by the central authority. One of the consequences of this had been well pointed out by Prof. Robinson. Incompetent engineers were called in, and they got sewage and other works constructed which did not fulfil their essential requirements. We want a county or central authority which should exercise more supervision by systematic inspection, on similar lines to those adopted in our educational system. We want the higher officers to be devoted entirely to their work, and independent of the local authority. The higher authority might suggest or direct lines of local sanitary work or enquiry; and at least by inspection on the completion of public works, withhold loans from local authorities where sanitary work showed incomplete or imperfect construction.

Mr. A. E. ECCLES (Chorley), said it seemed as if the legislature were determined to keep people in the large towns, inasmuch as a charge were imposed upon all manner of vehicles, either in the shape of rates, taxes, or licences. Agricultural labourers had been driven into the towns to reside under more unsanitary conditions. He thought it would be wise if people who *worked* in towns could be in a position to have their dwelling houses in the country.

Mr. HENRY E. ARMSTRONG (Medical Officer of Health for Newcastle-upon-Tyne), said that to most sanitarians the valuable, original, and complete works of Simon and Farr were practically buried. So were to a certain extent those of the Local Government Medical Department, from the time of Simon to the present date—because very few persons knew of them at the time of their issue—and indeed till they were out of print! He considered that large Urban Authorities and Medical Officers of Health, who give all their time to their duty—(to whom these Reports were stock in trade)—should be furnished gratuitously with copies, or at any rate should have early official intimation of their issue. He had written to the Local Government Board (of whom he wished to speak with all respect) to that effect, and had received reply that his letter would receive due consideration. That consideration had been due, and was long overdue.

Dr. ALFRED CARPENTER (Croydon), in replying, said he thought it a very great privilege to have his paper criticised by a former

President of the Local Government Board, who was able, from his own personal knowledge, to confirm what he had stated to the Congress, respecting the great value of the Reports alluded to from a sanitary point of view. Lord Basing stated that there were cases in which the statement he had made respecting land-owners was true; but that there were many exceptions, and others were being removed. He was quite ready to agree that it was so, and that there were many land-owners doing their duty with regard to the tillers of their soil, and the occupants of small cottages upon their estates; but still the fact remained that there was an immense proportion of the population of this country who were improperly housed thirty years ago. When these Reports were written they were not provided with any water-supply at all; in some cases deprived of the ability to comply with the decencies of life, and also occasionally of the means of living. It was an axiom of the law of England, that the want of knowledge with regard to a certain law, was no defence when raised before a court. It was said by the judges that a man was bound to know the law, and if he did not know it, his ignorance might to some extent diminish the penalty, but he was liable for the consequences none the less. Although the land-owners years ago were not aware of the evils following their want of sanitary directions and hygienic requirements in the case of the poor upon their estates; still, to some extent, they were responsible for the consequences. With regard to manufacturers, he quite agreed with Lord Basing that there were some manufacturers, and some, to his knowledge, in Bolton, who were worthy of the highest commendation for the means they took to preserve the health of their operatives, and for the purpose of raising them in the position to which they belonged. This was all perfectly true, but still there was the fact with regard to industrial districts that there was an immense mortality in this country produced by some ailments which were preventable. It was the object of a Congress like that to make known the knowledge of this fact and to produce the incidence of disease; if they did not point this out and pronounce some judgment upon those who disobeyed them, they were not likely to get that zealous spirit in the actions of the people which was necessary for the removal of these evils. He thanked Lord Basing for his observations, and the kindly manner in which they were made. Professor Robinson's observations he thought confirmed what he had said, viz., that men who called themselves engineers, did carry out works in ways very objectionable; and in the matter of sewers, much mischief was wrought by allowing them to become sewers of deposit. If they got a sewer in this town which gave out odours through the street grids, they might try to deal with those odours by destroying them as they came out, but it was a kind of tinkering which he did not think right; it was much better to go to the root of the evil and prevent the sewers from depositing. He was quite willing to accept Professor Robinson's statement. Dr. Page also made some observations which were very suggestive in regard to the failure on the part of the authorities to do their work under the laws imposed upon them. The authorities ought to do those works, and there was a want of

some kind of machinery by which the higher and central authorities should come into play much more easily than was the case at present, and should supervise the work of the local authority in a more efficient manner than was done, and also that they might be brought into play in a locality by others than those who were members of the local authority. With regard to the observations that fell from Mr. Armstrong with reference to reports being buried, he said they had examined a number of them, and they had been supervised by Sir John Simon himself, who had made additions to the reports here and there. He had seen the sheets when they passed through the press, and had given his support to the work which the Institute had carried out, and in the way he had always been accustomed to do. He had devoted a great deal of time and attention to those works going through the press, and had done it for the Council of the Institute without any thought whatever of reward for himself, except the thanks of the public.

Professor RUSSELL REYNOLDS, M.D., F.R.S. (London), remarked that there was a vast amount of useful information stored in the blue books, and by a judicious selection from them a great amount of valuable information might be excerpted for the use of members. On this ground Lord Basing had consented to move, and Mr. Tatham to second the following resolution:—"That this section having heard Dr. Carpenter's address on the publication of the reports of Dr. Farr and Sir John Simon by the Council of this Institute, recommend to the Council that there are many other medical essays on Sanitary subjects which at present are only to be found in the Blue books of the Privy Council and the Local Government Board, the publication of which in an accessible form by the Sanitary Institute would very much further the progress of Sanitary Science and practice."

Mr. J. C. STEVENSON, M.P. (South Shields), said that he had not the slightest doubt that Members of Parliament would be delighted to forward these books to the sanitary officers of their respective boroughs, as he had himself been in the habit of doing.

On "*The Prevention of Blindness through Governmental Agency*,"
by DAVID MCKEOWN, M.A., M.D. (Manchester).

THE intimation that a Royal Commission had been issued to enquire into the best means for the amelioration of the condition of the blind gave rise to a feeling of universal satisfaction, and to the hope that it might result in the adoption of measures alleviating the miseries of this afflicted class. So great and

general is the sympathy for these unhappy people that, if the object in view can be attained, few will grudge the necessary outlay.

To minister to the wants and to the sorrows of those who have been stricken blind is humane and noble, but it is much more humane to stretch forth, while it is time, a helping hand, and rescue from the abyss of darkness those who are on its brink. I propose to show how this can be done for a large class of the blind. The most frequent cause of total blindness—blindness of both eyes—is one which can be easily rendered harmless; and this cause is the most important in regard not merely to frequency, but also to the period of its activity, for it may almost be said to come into operation with life itself consigning its victims to lifelong darkness. The cause to which I refer is the inflammation of the eyes which manifests itself within the first few days after birth, and which is known as the purulent ophthalmia of infancy (*Ophthalmia Neonatorum*).

The ravages of this affection may be classed under the following heads:—

- 1st. Total blindness, *i.e.*, blindness of both eyes.
- 2nd. Blindness of one eye, with or without permanent impairment of the vision of the other eye.
- 3rd. Permanent impairment of either one or both eyes, neither eye being blind.

There are in the United Kingdom thousands of persons totally blind, whose calamity has been produced by this cause. It is not at present possible to ascertain the exact number. A personal visit to all the institutions (public and private) in the kingdom where the blind are admitted would not advance us, because we would leave untouched the large classes of (*a*) the itinerant blind, and of (*b*) those who reside with their friends. Regarding them, the only information available is that supplied by the census returns, *viz.*: that there are so many "blind at birth," *i.e.*, practically speaking, blind from *ophthalmia neonatorum*. But this is very imperfect; for, as *ophthalmia neonatorum* does not show itself for a number of days after birth, those returned as "blind at birth" form only a part of those who have lost their sight from it. Again, the term "blind" is elastic in its application. For practical purposes it should include all persons whose sight is so defective as to preclude them from entering upon employments for which fair sight is regarded as essential. Such an interpretation would doubtless add a very large number to the ranks of the blind. A person who had "guiding sight" would hardly in a census return be described as totally blind. Even some of the

institutions for the blind in this country refuse to admit any one who can do more than distinguish light from darkness; mere "guiding sight" is a disqualification.

Whilst we cannot determine the total number of those blind from *ophthalmia neonatorum*, we have some interesting data. This affection has been charged with having caused the blindness of—

658 out of 2,165 inmates of 22 blind institutions (Dr. Reinhard.)

10·81 per cent. of 2,528 cases analysed by Dr. Magnus.

37 out of 89 pupils in the Wilberforce School for the Blind.

70 out of 217 recorded cases at the Deaf, Dumb, and Blind Institution at Belfast.

38 out of 111 cases at the Sheffield Institution for the Blind investigated by Mr. Snell.

From 33 to 50 per cent. of the total number of the blind in various countries (Dr. Haltenhoff).

Regarding the second and the third classes statistics are wanting; but there is no doubt that the number of those who have lost one eye, or have had the vision of one or both eyes permanently impaired, far exceeds the number of those totally blind.

It is important to bear in mind that the measures for the prevention of the total blindness are also efficacious in regard to (1) the partial blindness (blindness of one eye), and (2) the permanent impairment of vision; and further, that these two classes are numerically much the larger, and that the disabilities under which their members suffer may be such as to mar or even blight their prospects in life.

Practically speaking, these ravages can be prevented. Ophthalmic surgeons are agreed that, if treatment is commenced at an early stage, the affection is within the control of the medical attendant.

The reason why so many persons have become the victims of a disease so manageable is, medical advice has either not been sought at all, or sought when too late. Although the children are probably ill on or before the fifth day after birth, it is often several weeks before a doctor is consulted. The delay is due to the belief that the infants have caught a cold in the eyes, and that it will wear away without doing any harm.

Delay in seeking medical aid—a delay due to ignorance of the danger—is the very essence of the question, and hence the necessity for solving the following problem: What is the most simple and effectual way of removing this ignorance? in other

words, of impressing on the minds of those in charge of new-born infants (a) that purulent ophthalmia may occur; (b) that it is very dangerous; and (c) that if the child's eyes become affected they must be treated, without a day's delay, by a doctor. We ought as far as possible to comply with the following conditions:—

1. Select the most appropriate time, viz., when those to be instructed are watching a new-born infant. The matter will then be presented with a vividness and reality which could not be obtained at any other time, and will have such a practical bearing as to secure the closest attention to the advice given.

2. Offer the information in the form in which it is most likely to be grasped and retained by the mind. That form is undoubtedly one in which the information stands alone, and not mixed up with a number of minute directions which, however valuable in themselves, are, as compared with it, of not the slightest moment. Whatever we wish to impress on the minds of the uneducated classes must be very simple and very short. The following card would answer the purpose:—

Instructions regarding New-born Infants.

If the child's eyelids become red and swollen, or begin to run matter, within a few days after birth, it is to be taken, without a day's delay, to a doctor. The disease is very dangerous, and, if not at once treated, may destroy the sight of both eyes.

3. Give not only written but also verbal instruction where those interested cannot read.

4. Use an agency extending over the whole Kingdom and possessed of the greatest possible weight. Happily, two great state organisations are available.

I desire to call attention to two Governmental plans for the instruction of the public by the distribution of the card already mentioned. The first plan utilizes the provisions of the English, Scotch, and Irish poor-law systems, and reaches with ease and certainty that class which seeks under those systems medical aid in labour cases. In England those provisions are very simple. I need not enter into the details; it is sufficient to state that, in every instance, the relieving officer becomes cognizant of aid being required, or of its having been granted; and Article 215 of the Consolidated Order of 24th July, 1847, thus defines part of his duties: "In every case of a poor person receiving medical aid, as soon as may be, and from time to time afterwards,

to visit the house of such person, &c." The Scotch system requires that in every case in which application for relief is made, the inspector of the poor shall, within 24 hours, either personally or by an assistant inspector, visit the applicant's home.

Thus in England the relieving officer, and in Scotland the inspector of the poor, are available for giving the necessary instruction by reading and handing the card to the applicant for medical aid, or to the person in charge of the patient.

The Irish system is equally simple. Ireland is divided into a number of dispensary districts, each one of which has one or more medical officers, who give medical relief to the poor, but only on the production of a ticket signed by a person duly authorized. Such authorized persons, when giving the ticket for medical aid in labour cases, can read and hand a card to the applicant; the card can be appended to the ticket.

This plan is simple and inexpensive, and, so far as it goes, effectual; it is not, however, comprehensive enough. For the women who do not avail themselves of the poor-law system some other avenue is necessary. It is true the mere reading of one card would lead to a considerable dissemination of the information. This is easily understood by those who know how women congregate upon the occasion in question; still the dissemination thus obtained ought to be accelerated and supplemented; this we can accomplish by the second plan, which is applicable directly to all classes of the community, and is likewise simple and inexpensive.

Parents are required to register every birth within a certain number of days after the event, and the Registrar can, upon each registration, read and hand a card to the person registering. After the adoption of this system only one child in a family would run any risk from the ignorance of the parents. The card given upon the first registration in any family would probably be useless for the child then registered, but it would be an effectual warning for all the subsequent children born of the same parents.

In March, 1884, I read a paper on this subject before the Ophthalmological Society of Great Britain and Ireland, which comprises hospital ophthalmic surgeons in every part of the kingdom, and I moved a resolution recommending the Governmental instruction of the public by the distribution, in the manner I have just described (through the medium of the Poor-Law and Birth Registration Organizations of the kingdom), of the card already referred to.

This resolution was (together with others which I had proposed on the same subject), in June, 1884, unanimously adopted by the society, which in the meantime had had the matter

investigated by a committee. A copy of it was forwarded by the society to the President of the Local Government Board of England and Ireland respectively. The Irish Board took action in the matter so far as the Poor Law System was concerned, but I believe the subject has not been formally brought under the notice of the authorities for the registration of births in Ireland.

The English Board replied that, while fully recognising the importance of the object which the society had in view, they did not consider that they could impose on the relieving officers the duty which the society proposed should be assigned to them. We are not told the reason for this decision, but the obvious inference is that it was because the labour entailed was regarded as an unconscionable increase to the duties of the relieving officer. What then is this labour? Carrying in the pocket a few cards weighing altogether an ounce or two, and occasionally reading one, the reading occupying seventeen seconds! Is it possible this would be the last straw?

Accompanying this reply was a copy of a communication from Sir B. P. Henniker, the Registrar-General, to the Local Government Board, in which he dealt with the proposal so far as the Registrars of births were concerned, summing up thus: "The above considerations lead me to the conclusion that the proposal made by the Ophthalmological Society is not a practicable one." The considerations are three in number, and, as they are rather peculiar, I give them *in extenso*.

The first is: "This would give considerable trouble to the Registrars; and they would most certainly, and not unreasonably, demand to be paid for the service which does not form part of their recognized duties. Say that the Registrar was paid no more than twopence for each card which he read and delivered, the cost in payment to Registrars would nevertheless amount to no less than £7,333 a year, as there are some 880,000 births annually registered." It is well known that in this country one of the most successful methods—probably indeed the most successful method—for strangling any movement is to create the impression that it would be costly. The present objection is formidable in appearance only. Its foundation—the estimated twopenny fee—is of the most shadowy kind, and will not bear the slightest examination. A twopenny fee for 17 seconds! Surprised at this estimate, we naturally turn to the scale of fees actually paid to the Registrars, and our astonishment is certainly not diminished by the examination, which reveals the fact that this scale was absolutely ignored. This fact we recognize at once, when we find that the fee allowed to the Registrars for the labour involved in filling up

(and, where the recipient is unable to read, explaining) the vaccination notice is just one penny. Upon what basis was this monstrous twopenny fee estimated?

The second consideration is: "Again, the person who comes to register a birth at the Registrar's office is by no means necessarily the mother, who will afterwards be responsible for the infant's management. The Registrar would therefore frequently read the card to a person who will have nothing to do with the care of the child's health."

The card is intended to be a warning for the benefit, not, as the Registrar-General supposes, of the child being registered (it would likely be late for that), but of all the subsequent children born of the same mother, so that only one member of a family—the one first registered—would run any risk from the ignorance of the parents. This I have already explained. Did it occur to the Registrar-General that his mode of reasoning was a condemnation of the distribution by the Registrars of the vaccination notice?

The third consideration is: "Neither must it be forgotten that purulent ophthalmia is by no means the only serious affection to which children are liable to fall victims owing to the ignorance of their mothers. If the Registrar of births be employed to give directions as to the mode of avoiding this disease, there seems no reason why he should not equally be called on to read out and distribute directions as to all other ailments to which infants are liable from their mother's ignorance or carelessness; and, in short, to give each mother a discourse on the proper management of a child's health."

I did not think that the simple card of warning could be misunderstood by anyone, much less by the head of a Government department. The card does not give "directions as to the mode of avoiding this disease" (*ophthalmia neonatorum*). It merely points out the danger and the necessity for immediate medical treatment. The views of the Registrar-General upon the public health are curious. To his mind, the ignorance which leads to the loss of sight or of life of a child is of no more consequence than the ignorance which is attended by a slight temporary disturbance of health, and he thinks that, as it is absurd to take any notice of the latter, the former is deserving of no attention. Fortunately, these views are not shared by the State, which does recognize differences and distinctions. It is not necessary to support this statement by a summary of what it has done respecting the public health. The fact will hardly be questioned. The Registrar-General ought to know something about the subject. He should not have overlooked the fact that his department has duties to discharge regarding

that important matter—vaccination. Now the position of *ophthalmia neonatorum* is unique. This is manifest when we consider the definite and restricted period of its first manifestation, its early and unmistakeable symptoms, the widespread ignorance regarding the danger, the terrible results of the neglect consequent upon this ignorance, the lifelong privations and miseries of its victims, the almost absolute certainty of a successful termination of the affection when medical treatment is commenced at an early stage, and the vast good to be done by merely giving a timely word of warning regarding the danger.

I refrain from making any comment upon the awkward position in which the Registrar-General has placed himself by his decision "Not practicable," founded upon the three considerations which I have examined. I am satisfied with showing that the decision and the considerations are, so far as the scheme referred to him is concerned, absolutely worthless.

The only possible argument against the scheme in its entirety is that a small allowance should be made to the Registrars for the reading. This is removed by dispensing with the reading, which was only necessary in those instances where the recipient was unable to read, a class which, thanks to the present system of education, is every year dwindling. In addition, a person who cannot read will be able to find some one who can, and thus learn the contents of the card. The cards can be printed separately, or, if thought desirable, can be appended to the vaccination notice by a perforated attachment, so as to be easily separated and retained. The cost is thus reduced to the printing of cards.

On the 15th of May, 1885, Mr. Russell, M.P., Parliamentary Secretary to the Local Government Board, who was accompanied by the Registrar-General and Dr. Buchanan, received a deputation from the Ophthalmological Society (consisting of Mr. Jonathan Hutchinson the President, Sir William Bowman, Mr. Tweedy, the Secretaries Drs. Brailey and Abercrombie, and myself), which, having entered fully into the merits of the question, suggested that, in order to remove any possible monetary objection, the reading by the registrars should be dispensed with. Mr. Russell, who expressed himself as being in full sympathy with the aims of the deputation, promised to lay before the President of the Local Government Board the views which had been put forward; he intimated at the same time that the Local Government Board had no power to order the Boards of Guardians to do anything, but that those bodies showed great readiness to give effect to recommendations made by the Local Government Board for the benefit of the public.

The Registrar-General said he would have to further consider the matter so far as it related to his department.

No communication has since then been received by the Ophthalmological Society from the Local Government Board. This may be due to the change of Government, which took place a few weeks after the interview. The matter has been before the Local Government Board a considerable time, and it is not desirable that it should remain longer in abeyance.

No question has been raised as to the power of the Local Government Board to direct the distribution by the Registrars; and, so far as the distribution by the relieving officers is concerned, the recommendation by the Board of this step would probably be sufficient. It is reasonable to suppose that, if there be any technical difficulty about the adoption of either of the two plans, the necessary power or sanction will be easily got from Parliament.

Infants of a few weeks—it may be only a few days—old, consigned to lifelong darkness, and to all the miseries, privations, and afflictions which it entails, and sorrowing parents riven with anguish, would form a fitting theme for a powerful appeal to the feelings; but I do not think it necessary to avail myself of it. There is no lack of sympathy—active sympathy—for the blind, and for those who are threatened with blindness, and all that is required is to direct attention to the new and most fruitful field open to us, and to show how it can be wrought. I have pointed out that there is a vast amount of total and partial blindness, and of impairment of vision of one or both eyes, due to *ophthalmia neonatorum*, which is one of the most manageable of diseases; that these ravages are due to delay in seeking medical treatment; that this delay arises from the widespread ignorance regarding the danger of the affection; that, practically speaking, these ravages can be prevented by dispelling this ignorance; that this object can be accomplished by the distribution of a very short card of warning by two Governmental agencies—the Poor Law and the Birth Registration organisations of the Kingdom; and that the cost would be merely that of printing the cards, and therefore trifling.

I might give calculations showing that, by the very small expenditure involved by the plans I have described, the country would be a great gainer from an economic point of view; but such are not needed. Everybody knows that blindness is the cause not merely of a very large annual expenditure for maintenance, &c., but also of a great loss of productive power. We must accept one of two alternatives: (a) spend a trifling sum in rescuing those who are threatened with blindness from *ophthalmia neonatorum*; (b) allow this disease to claim its

victims and then find the money—no longer a trifling sum—which their condition may necessitate. There is no room for doubt as to the choice to be made. Happily too economy and humanity go hand in hand.

Mr. F. SCOTT (Manchester) said that Dr. McKeown's paper seemed to ignore the possibility of preventing blindness in some cases without the aid of a medical man. It was obvious that under certain conditions a medical man should be called in; but if it were possible to give information to a parent which would obviate the need of calling in a doctor, that should be done. The Manchester and Salford Sanitary Association had issued a leaflet with that object, and he thought that through the agency of such voluntary associations much might be done to prevent blindness that was the result of ignorance rather than inherited or acquired disease. Governmental departments would naturally resist any such obligations, for when once a precedent was established they would be assailed with all manner of claims for similar help. It would be a course much more likely to succeed than through such an organisation as the London Society for the Prevention of Blindness. Sanitary associations and church agencies should be induced to co-operate in spreading information of the kind provided by the Society just named, and by the Manchester and Salford Sanitary Association. It was not to be wondered at that the matter had been taken up in Ireland by the Government authorities, especially in the South, because there was a great prevalence of blindness there, and apparently no voluntary agency whatever for sanitary purposes. He had been in the South of Ireland during the past few weeks, and noticing the exceptional amount of blindness and eye complaints there, he sent a copy of the leaflet of the Manchester and Salford Sanitary Association to the Cork papers, one at least of which published it in full; and a gentleman in the town—a member of the Board of Guardians—had written to him to say how pleased he was with it, and stating he would reprint it for circulation there. The evil was much graver in Ireland than in Great Britain, and the Irish Board might rightly undertake the reform, while we could not reasonably expect the English Board to do so.

Dr. McKeown (Manchester) explained that the Committee of the Manchester and Salford Sanitary Association had actually passed a resolution approving of the plan he proposed.

On "The Sanitary Registration of Buildings Bill, 1887," by
REGINALD E. MIDDLETON, M.Inst.C.E., M.Inst.M.E.

As the Sanitary Registration of Buildings Bill, 1887, has received a good deal of attention in some quarters, while its importance as affecting householders seems to have been lost sight of by those most interested in its provisions, a few remarks on what is proposed to be effected by the Bill may not be inopportune. The object of this Bill is stated to be the compulsory registration of the sanitary condition of all buildings used for certain specified purposes, and the voluntary registration of any other buildings.

A very strong feeling exists, it is thought, that the general sanitary condition of buildings is not what it should be, and as there is at present no means, short of having the building inspected by a professional man at some expense, which enables an intended occupier to know anything of the sanitary condition of the house he proposes to rent; and as in the case of hotels, asylums, and other buildings of this description, even this protection is not afforded, for it is obviously impossible for every visitor to an hotel, every father who sends his son to school or college, to have the sanitary condition of such buildings examined; it is therefore thought that if the owners and occupiers of such buildings could be obliged or encouraged to have their properties inspected, and these inspections registered, such an arrangement would give confidence to the public, and would be of general advantage both to the users of the buildings and to the owners and occupiers; and it is hoped that when these advantages become apparent, owners of houses not included in the list of those which must be registered compulsorily, would see that it is to their advantage to have their properties registered, and would voluntarily take the same course.

Should it be found possible to draft a Bill which would effect this change in the liability of owners, and oblige them to be able to show the satisfactory sanitary condition of their property at any time, and to do this in a simple and efficacious manner without throwing any undue burden on any person or class of persons, it seems pretty clear that a public benefit would be the result. But whether the Bill lately before Parliament would have the desired effect, or would in itself be a public benefit, may be doubted; and the writer is of opinion that the

objections to it, as at present drafted, are many and serious, and it is with them that he now proposes to deal briefly.

The Bill provides that hotels, schools, colleges, hospitals, asylums, and lodging houses shall be put in a satisfactory sanitary condition and registered; but if it be necessary that these buildings should be certified by a licentiate in sanitary practice, it is equally, if not more, necessary and important that boarding houses, restaurants, bakeries, butcheries, dairies, and places of whatsoever description where food is collected, stored, or manufactured, and whence it is distributed, should come under the same category. The first-named places are all more or less subject to publicity in cases of illness or epidemic, but how much evil may result from faulty sanitation in the latter, who can say? To trace any illness arising from bad drainage in the buildings named in the Bill is comparatively easy, in those indicated by the writer exceedingly difficult; yet these latter are entirely omitted from the provisions of the Bill.

The Bill is one of registration only; and although the Local Government Board is specified as the authority under which the Bill should be put in force, if it be enacted, no power is given to that body beyond the registration of the acts of the licentiates in sanitary practice, who, so long as they act up to certain very vaguely defined requirements specified in clause 10, have a free hand and are answerable to no body, and do not draw their power to act from any authority save that of the Bill itself, and their own ability to obtain a certificate or license. This seems to be rather an invidious position for a Board entrusted with the supervision of sanitary matters, and as registering machinery only is required, the writer suggests that such machinery already exists in the persons of the Registrar-General and his Registrars of births, deaths, and marriages; and that this machinery might be used with less friction and to more advantage than that indicated in the Bill.

It is left an open question in the Bill as to who shall bear the expense of the alterations rendered necessary by its provisions, and it may be inferred that, as the occupier would be the person who would have to pay the penalty if the work were not done, and as he would be more easily reached than any other person, he would be made to bear this cost. This does not seem to be just, as, if there be an obligation on the part of somebody, as is certainly implied by the existence of this Bill, that buildings should be in a sanitary condition, such obligation must surely rest with the owner of the building in question; it is therefore suggested that it should be a provision of this or any similar Bill, that the occupier should have power to recover

from the owner in the same or a similar manner as is provided in clause 97 of the Metropolitan Building Act.

In like manner no provision is made for the localising of the charges which would be incurred in enforcing the provisions of the Act, in printing and forwarding notices, in registering licentiates and buildings, and in carrying out the necessary examinations; it is therefore suggested that fees should be charged for each of these acts, with the exception of printing and sending notices, and that any expense incurred beyond the amount provided by the fees should be supplied by the department of the Registrar-General, and should be under his control.

In the Bill before us it is provided that (1) Members of the Royal Institute of British Architects, Members of the Institution of Civil Engineers, and Members of the Royal Institute of Architects of Ireland, *who are registered in accordance with this Act as qualified in sanitary practice*; (2) Architects and Civil Engineers who have been in practice three years at the passing of this Act, and who shall before the first day of January, one thousand eight hundred and ninety, prove to the satisfaction of the Local Government Board that their practice as architects or civil engineers has been a *bona fide* one, and has included the designing and carrying out of constructive works; (3) Sanitary associations incorporated by license of the Board of Trade; (4) Medical practitioners *registered as qualified in sanitary science*; (5) Persons who are medical officers of health at the passing of this Act; (6) Such other persons as the Local Government Board may consider qualified, shall receive licenses in sanitary practice, and that these licenses shall be given free of cost to those who come under sections 1, 4, and 5 of this clause.

What is intended by the words, "who are registered in accordance with this Act as qualified in sanitary practice," and "registered as qualified in sanitary science," is not very clear. If it be intended that clause 9 is to refer to those after whose designation this limitation is placed, it refers to the members of the three leading Institutions, who must be examined by examiners, themselves unlicensed and unregistered, appointed by the respective Institutions, before they can receive licenses to practice; while architects and engineers who do not belong to any Institution have merely to satisfy the Local Government Board of the *bona fides* of their practice and experience. Sanitary associations and medical officers of health are under no limitations at all, and any other persons whom the Local Government Board may consider qualified will receive licenses to practice. If this be the true reading of clauses Nos. 7, 8, and 9, it is so manifestly absurd that it does not require further comment, especially as medical practitioners are required to be qualified

in sanitary science, not in sanitary practice—a very different thing—and no provision is made by examination or otherwise for their registration as having this qualification.

If the interpretation given above be the true one, then the order of precedence stands as follows:—

1. Sanitary associations.
2. Medical officers of health.
3. Such persons as the Local Government Board may consider qualified.
4. Architects and engineers not members of one of the institutions named.
5. Members of the institutions.
6. Medical practitioners.

The highest place in the list is taken by sanitary associations, who, as corporations, have no knowledge whatever of sanitary matters; who do not deal with these things themselves, but through their subordinates and officials; who are practically exempt from the penal clauses which are introduced for the punishment of those who contravene the provisions of the Bill; and who are, as corporations, simply collections of business men who, by joining forces, are able to employ qualified experts to do the necessary work; and who, again as corporations, are able to advertise themselves, which the qualified expert, who does the work, is by professional etiquette prevented from doing. The claim of any corporation to receive a license in sanitary practice is so utterly absurd that the writer does not think it necessary to carry the argument further, and presumes that he has failed to attach their true meaning to these clauses.

If, however, it be intended that all the persons mentioned should receive licenses the position is not much better; there are other professional members of the institutions named fully as well entitled to practise in sanitary science as their brethren who have obtained to full membership, and they cannot do this as corporate members of these institutions, but must get their licenses under section 2, as other architects and engineers. Sanitary associations still retain an equal position with professional men; medical practitioners may be qualified in sanitary science but are not, unless in a few isolated cases, in sanitary practice, and are therefore not qualified to inspect and superintend work, which perhaps more than any other requires practical knowledge to ensure its excellence. Medical officers of health labour under the same disabilities as medical practitioners, and are besides hampered by their official position, and the "other persons" should not exist as other persons; if they wish to practise they can do so as professional men.

To follow these arguments to their conclusion, it is considered that only corporate professional members of the institutions named, to which may be added the Institution of Civil Engineers of Ireland, who have reached the age of 27 years, should receive licenses on application. That architects and engineers who come under section 2 should satisfy the examiners in the same manner as it is here provided that they shall satisfy the Local Government Board. That all other persons shall be required to pass an examination before they can receive their licenses, and that the words corporations and associations should be entirely removed from the Bill.

If such vague and meagre minimum requirements as those contained in clause 10 be considered to be a sufficient protection to the public—and this can only be the case if it be thought that the understanding on this subject is so thorough and general that there can be no difference of opinion—why introduce any such clause at all? If, on the other hand, this thorough and general consensus of opinion does not exist, it is absolutely necessary that the specification should be as full and ample as it possibly can be on broad lines; and this can be no hardship to anybody, for if the consensus of opinion be general, the specification will be followed naturally and without effort; if the consensus of opinion be not general, or if there be any sanitarians who are ignorant of modern requirements, it is the more necessary that there should be a complete and binding specification, to which reference can be made and from which no divergence can be permitted.

In clause 14, it is provided that after the lapse of five years a building shall be considered uncertified; also that any alteration to any building which affects the sanitary arrangements of such building shall render the certificate null and void; but no provision is made for enforcing the publication of such alterations, which might easily be carried out without their coming to the knowledge of the Sanitary Registration Authority, or of any person interested in preserving the satisfactory sanitary condition of any building. It is suggested that the builder or other person who carries out such alterations, should be bound to inform the Sanitary Registration Authority of such alterations being made, under penalty as for misdemeanour in case of non-compliance with these requirements. As the enactment of such a Bill as that under consideration would be likely to give rise to much advertising of ability and readiness to certify for the condition of buildings by those who are not prevented by professional etiquette from taking this course to make themselves known, it is proposed that a clause should be introduced rendering it penal, by loss of license or otherwise, for any licentiate to

advertise, or allow to be advertised, his ability and willingness to grant certificates, otherwise than as is provided for in the Bill, that is to say by the published lists of licentiates; also, as abuses might arise from licentiates who were owners or part-owners or otherwise pecuniarily interested in buildings certifying for their own property, it is thought that provision should be made against this danger, by enacting that no licentiate shall grant a certificate for any house or building of which he is the owner or part-owner or in which he has any pecuniary interest other than as an adviser in its construction.

It is not thought advisable that any penalty should be recoverable before a justice of the peace unless he be sitting in court.

The writer trusts that these few remarks may be sufficient to stimulate discussion, and that thereby valuable information may be obtained which may result in a Bill being drafted and eventually enacted, which shall be satisfactory to all persons interested.

On "The Present Position of M. Pasteur in relation to Public Health," by R. AUGUSTINE CHUDLEIGH.

ONCE upon a time, says an ancient legend, the Plague-dæmon obtained leave to cause 500 deaths in a certain city. But soon the bills of mortality reported the deaths by plague to have reached the number of 3,500. The Plague-dæmon was immediately summoned to account for the extra 3,000 illegally done to death over and above the authorised number. "Sir," said the Plague-fiend, "I confined myself strictly to the prescribed 500. It was not I, but my neighbour, the Fear-fiend, who slew the odd 3,000."

The truth conveyed by this light Italian legend seems quite seriously implied by Marshall Hall in his curious classification of hydrophobia. In his "Principles of Diagnosis" he divides that disorder into two classes, namely, (1) Hydrophobia rabiosa, and (2) Hydrophobia sine rabie. But "hydrophobia without the rabies" sounds so strange, so suggestive of "*Hamlet* with

Hamlet left out," that we might be in doubt as to what Marshall Hall really meant were it not that he commences his 273rd section with the words, "It occasionally happens that we have to discriminate between a real and imaginary case of hydrophobia."

Imaginary hydrophobia must mean, I suppose, hydrophobia induced through *fear*; and though such a thing would seem impossible, yet a brief glance at the literature of the subject shews that the authorities are not few who would account the imaginary cases to be more numerous than the real, who would make Marshall Hall's second class far larger than his first; indeed, there are not wanting persons who deny the existence of hydrophobia as a specific disease altogether, and declare that when any real malady follows a bite, it is due to one or more of the known sequelæ of dirty lacerations, namely tetanus, meningitis, pyæmia, and a host of minor affections in various combinations.

Admitting however, that rabies in the dog, or hydrophobia in man, does really exist as a true, though rare disorder, it must nevertheless be insisted on, that in enumerating cases of rabid madness large deductions must be made from popular totals, seeing that if this species of madness existed in anything like popular quantities, there would soon be not a sane dog left in Europe, nor a sane man either. Reflect how often fever is accompanied by delirium; yet a feverish dog must not be delirious under pain of being accounted rabid.

Think too of the number of disorders wherein the profuse sweats observed in man would be replaced in dogs by foaming at the mouth. Yet a dog which foams is in imminent risk of being accounted rabid. Again, it is a habit with many animals to swallow large quantities of grass, hay, or other fibrous material, to sweep out parasites from the intestine. I have made some interesting observations on this point in cats, dogs, and ducks. And yet the presence of "foreign bodies," in a dog's intestine has been gravely accepted as evidence of rabies. But whether the madness imputed to a dog be real or imaginary, whether it be rabies rabiosa, or rabies sine rabie, as Marshall Hall would have put it, there is not much difference in the result. The terror caused by the cry of "Mad Dog!" so entirely baffles my descriptive powers, that I must borrow the language of William Somerville, born in 1692, who in the poem called *The Chace*, describes the whole horror from beginning to end in a series of word-pictures, sufficiently graphic to curdle one's blood. After a somewhat remarkable account of the two forms of canine madness, the dumb and the "outrageous," he supposes the dog escaped from the kennel and the

mad race begun. At first a horse is bitten and its death described. Then—

"Hence to the village, with pernicious haste,
Baleful he bends his course; the village flies
Alarmed; the tender mother in her arms
Hugs close the trembling babe: the doors are barred,
And flying curs, by native instinct taught,
Shun the contagious bane; the rustic bands
Hurry to arms; the rude militia seize
What'er at hand they find: clubs, forks, or guns,
From every quarter charge the furious foe,
In wild disorder and uncouth array;
Till now with wounds on wounds opprest and gored,
At one short poisonous gasp he breathes his last."

It seems that things were much the same two hundred years ago as they are now, for when the poet comes to speak of treatment after a bite, he laments that—

"Each hand presents a sovereign cure, and boasts
Infallibility, but boasts in vain."

His own faith lay evidently in the actual cautery, and thus vigorously does he prescribe it:

"The pointed steel
In the hot embers hide; quick, urge it home
Into the recent sore, and cauterize
The wound. Spare not thy flesh, nor dread the event;
Vulcan shall save when Æsculapius fails."

It will probably be conceded that fear has a very remarkable power of rendering people susceptible of whatever disease may be prevalent, and that canine madness is peculiarly calculated to appeal to the imagination, and excite horror and fear in an unusual degree. And it is upon this strangely fascinating disorder that M. Pasteur has been concentrating the attention of Europe for several years. Hydrophobia and rabies have been the great popular sensation upon which the popular mind has morbidly dwelt until it has come to see an angel of death in every dog, and has sanctioned a massacre of unoffending animals, upon which we are already beginning to look back with shame. The laws of supply and demand have been singularly verified. M. Pasteur had a large supply of hydrophobia cure; at once the demand exceeded all previous records. M. Pasteur created a demand for hydrophobia patients; the supply was such that Pasteur could "claim having saved more lives in six months than were previously threatened by rabies in any ten years."

Now, if M. Pasteur could really cure this malady, all the fuss and fright that he has caused about it would be condoned. But it is the verdict of almost all the civilized nations who have spoken at all, that M. Pasteur is so far from curing or preventing hydrophobia, that he actually causes it. In other words, he not only injures public health by spreading alarm, but he still further damages it by positively inoculating hydrophobia into persons who would have clean escaped if he had only let them alone.

As the public cannot be aware how strong is the evidence against the Pasteurian treatment, I will quote a few of the verdicts, official or semi-official, which competent authorities have pronounced against it.

1. Under the head of "Official Criticism of Pasteur's Prophylactic" the "British Medical Journal" has a paragraph from which I take the following: "The Belgian Government, in consequence of requests made in the Chamber of Deputies, lately deputed three Belgian physicians to investigate and report on M. Pasteur's method of preventive treatment of hydrophobia, and to decide upon the advisability of founding a Pasteur Institute in Belgium. The report of these gentlemen is decidedly averse to such a step."

2. Portugal follows Belgium's lead: for in a monograph on Rabies, published at the "National Press," and appearing "in the form of a quasi-official report to the Portuguese Government," Dr. Abreu attacks M. Pasteur's method, his statistics, his theory, his practice, and even his facts. Indeed, there is scarcely a single point in which he agrees with Pasteur.

3. Austria joins in the revolt. She sent Prof. A. von Frisch to study Pasteur's plan in Pasteur's own home. His report may be condensed into these few words: "Pasteur's original method does not prevent hydrophobia, his second method probably causes it." The result of it all is that the Austrian Government has recently refused to renew the grant in aid of a Pasteur Institute at Vienna.

4. In various communications to the "British Medical Journal" Dr. Spitzka of New York ridicules the position of M. Pasteur. In allusion to the discovery that "foreign bodies" in a dog's stomach do not prove it to be mad, he writes thus: "It was the demonstration of this fact in this city that led to the discontinuance of the New York Pasteur Institute, one of whose chief defenders attempted to inaugurate a hydrophobia scare on the strength of the discovery of foreign bodies in a vagrant cur."

5. A Pasteur Institute has also been closed in Russia, a

country which has suffered heavily from Pasteur's "intense" treatment.

The question now arises, "How is it that, in the face of all this opposition, the whole Pasteurian edifice has not, long ago, fallen to the ground?" The answer is that the tottering ruin has been propped up for a while by that astonishing document the Report of the English Commission. That the English verdict is against the evidence, and fully maintains our insular peculiarity, no one who reads what is done in other lands can venture to deny. I unhesitatingly pronounce the "statistics" on which the Report relies, to be among the most preposterous I ever met. Take for example those famous ninety cases, whose details take up fifteen foolscap pages, and on the strength of which M. Pasteur's method is proclaimed a grand success. It will scarcely be credited, but nevertheless it is a fact, that all those ninety cases were treated on an abandoned system—on a system which has been discarded and rejected in favour of a still worse system, which has in turn been discarded itself. Whatever is based on those ninety cases is based on an exploded system, a fact which is enough of itself to ruin the character of the entire report. Another ruinous mistake is that the report calculates the expected mortality (at the rate of 5 per cent.) on the whole number treated, namely, on 2682 persons, and asserts that 130 should have died.

But the expectation should manifestly have been calculated, not on the whole 2682, but on the 2682 minus those who were inoculated "in order to quiet fears," and minus those who were bitten by dogs which were proved not to be rabid, and those who were bitten by dogs pronounced rabid merely because they foamed, or had straw in their stomachs, or were in any way the victims of mistaken diagnosis. Thus, and even more, should the 2682 be diminished before comparing the actual with the expected mortality. Dr. Lutaud, one of Pasteur's own countrymen, has actually made this corrected comparison; and this is his result,—"What then is the benefit of the new treatment? Twenty-five more deaths than if there had been no treatment at all."

I conclude, then, that in spite of the solitary voice of the English Report, the weight of evidence and of argument is strongly opposed to M. Pasteur's "cure." It is time that this bubble were burst. It is for their health that the public should know that hydrophobia is a most rare disease, that there is no good cause for all this fuss and scare, and that the sooner they are diverted from the phantom that terrifies them the sooner will their minds regain their usual tranquility.

CONFERENCE OF MEDICAL OFFICERS OF HEALTH.

Lord BASING, F.R.S., in opening the proceedings, said he regarded this Conference as one of the most important features of the Congress, and one from which much good would result. In Professor Corfield, their chairman, they had a gentleman occupying a position in one of the most important districts of London where his assiduity and great acquirements were thoroughly recognized. The powers for the government of the health of the country were rapidly passing away from the central office to the local boards, and it was to the agency of the officers who were not unwilling to recognize such control as was necessary on the part of the central government that they must look for a certain uniformity in complying with the requirements of the law; the new system would have a tendency to make the work of public health administration at once uniform and elastic. If that were done with intelligence and tact he saw no reason to doubt that they would make rapid progress in the cause they had at heart.

Prof. W. H. CORFIELD, M.A., M.D.Oxon., on taking the chair, said it had not been usual for the chairman to deliver an address, but he thanked Lord Basing for his complimentary remarks, and could only say he should be most happy to give what little help he could to the proceedings of the conference. One point to which he wished to draw attention was of very great importance to Medical Officers of Health, partly as such, and partly as persons qualified to give sanitary advice: he referred to the question of the sanitation of houses. There had been two bills prepared for submission to Parliament with the avowed object of providing for the better sanitation of houses, or for the registration of houses for sanitary purposes. They had been carefully considered by the council of the Medical Officers of Health and by the council of the Sanitary Institute, and both had been condemned in toto by them; and, if necessary, Parliament would be petitioned against either of the bills becoming law. In a paper before the Congress which had been printed and circulated, he saw that it was proposed that all engineers and architects should

be considered qualified to certify as to the sanitary condition of houses, but that Medical Officers of Health should not. If Medical Officers of Health were not capable of certifying to the sanitary condition of houses, he certainly did not know who were. With the exception of some half dozen engineers and a few architects who had paid special attention to the matter of house sanitation, he would venture to say that any Medical Officer of Health in that room was better fitted to certify as to the sanitation of houses than were the whole body of civil engineers or architects. This being the state of affairs, he urged upon them not to lose sight of the matter, and not to let slip out of their hands a very important method of improving the health of the people, and a very proper and legitimate source of professional remuneration.

On "*Death-causes and their Classification*," by FRANCIS VACHIER, F.R.C.S., F.C.S., Medical Officer of Health for Birkenhead.

THE intelligent Medical Officer of Health, as year by year he laboriously prepares his tabular statements of mortality classified according to diseases, ages, and localities, is almost necessarily troubled with occasional doubts as to the utility of this work. The information furnished to him through the local registrars as to the ages of deceased persons and the house or place in which each death occurred, is fairly precise and accurate, and yields material for summaries and deductions more or less valuable. On the other hand, the particulars as to the cause of death in the registrar's returns are often other than precise and accurate, and misgivings arise as to their sufficiency for the purposes they are made to serve. The reason of this is not far to seek, for while age at death and place of death are simple matters of fact cognizable without difficulty, the cause of death is frequently a very complex problem to determine even when all the necessary data are given, and a quite insoluble problem when the data are withheld.

From whom then comes the information entered under the

heading "cause of death" in the registrar's records? In other words, to whom is entrusted the important duty, when a death takes place, of deciding what produced death? This question is answered by turning to Clause 20 of the Registration of Births and Deaths Act (1874): "In case of the death of any person who has been attended during his last illness by a registered medical practitioner, that practitioner shall sign and give to some person required by this Act to give information concerning the death, a certificate stating to the best of his knowledge and belief the cause of death, and such person shall, upon giving information concerning the death, or giving notice of the death, deliver that certificate to the registrar, and the cause of death as stated in that certificate shall be entered in the register, together with the name of the certifying medical practitioner."

"Where an inquest is held on the body of any deceased person, a medical certificate of the cause of death need not be given to the registrar, but the certificate of the finding of the jury furnished by the Coroner shall be sufficient."

In short, if the deceased has been attended during his last illness by a registered medical practitioner, the practitioner must notify to the best of his knowledge and belief the cause of death, unless he understands an inquest is to be held. If the deceased has not been attended during his last illness by a registered medical practitioner, a person qualified to be informant for the registration of the death notifies the registrar of the death, stating the name, age, and rank or occupation of deceased, the date and place of death, and adding to the best of his knowledge and belief the cause of death. A death thus reported is registered, and the alleged cause thereof entered, unless the Coroner, to whom the particulars are submitted, in the exercise of his discretion elect to hold an inquest on the same. The official entry as to the cause of death is therefore made on the authority of (1) a registered medical practitioner, (2) a Coroner's Jury, or (3) a person qualified to be informant of the death. It will thus be convenient to consider death-causes under three heads—as certified by qualified medical practitioners; as certified by Coroners' Juries; and causes uncertified.

I. DEATH-CAUSES CERTIFIED BY QUALIFIED MEDICAL PRACTITIONERS, forming about 90 per cent. of the sum of the death-causes registered, are as recorded, infinitely more reliable and useful than death-causes as set forth in the verdicts of Coroners' Juries. Still experience in classifying causes certified by medical men reveals certain defects which it is well to point out, as some at least may be easily avoided. I have found a certain proportion (not a large proportion by any means) of

such certificates embarrassing, and the information they contain difficult to classify owing to:—

(a). *Excess of information.* I give a few instances, taken almost at random from last year's record in a small sub-district.

1. "Bronchitis, whooping cough, convulsions" (age 1½).
2. "Rheumatic arthritis, gout, morbus cordis" (age 75).
3. "Acute bronchitis, diarrhoea, debility" (age 63).
4. "Debility, diarrhoea, effects of vaccination" (age 6 months).
5. "Congestion of kidneys, congestion of lungs, œdema of brain" (age 48).

It would not have been difficult to find much more striking examples. Indeed, I have occasionally seen the cause of death certified as due to four or five distinct diseases, so that it might, with almost equal propriety have been classed among the zymotic diseases, the local diseases, the constitutional diseases or the developmental diseases. This ought not to be, and medical men in certifying would do well to bear in mind what is the object and use of the certificate they give, and always make it clear on the face of it at least in which class of death-causes they wish the death to be entered.

(b). *Deficiency of information.*—Examples of certificates giving incomplete information will occur to many here present. In a recent return made to me the cause of death was ascribed to hare-lip. Last year a death was certified to me as due to urinary fistula, and on a previous occasion I saw a certificate ascribing death to the same cause. Again I find many entries in every year's register in which the deaths of not very old people are ascribed to the effects of age. Thus—man and woman aged 60 "senility;" woman aged 58 "senile decay;" woman aged 50 "atrophia senilis." In people from 50 to 60 years of age there surely must be some more immediate cause of death than old age. Perhaps the most remarkable instance of deficiency of information I have had to deal with, was a copy of a certificate of the death of a married woman under 40 years of age, in which the death was ascribed, by the medical man in attendance, to "natural causes."

(c). *Too general terms being used.*—Under this head I especially refer to the use of such terms as coma, without stating the cause of the coma; or apnoea, which is equivalent to saying that the cause of death was "want of breath." I must protest, too, against deaths being certified as due to asthenia, or exhaustion, and to the frequent use of the familiar terms debility and marasmus. Tumour, also, is too general a term, and cannot be classified. Then I have often seen the cause of death ascribed to "stroke," and "confinement," and "stricture,"

and I interpret the terms as best I can, entering stroke to "paralysis," confinement to "childbirth," and stricture to "stricture of the urethra." However, the certifier should not thus leave his meaning to be guessed.

(d). *Symptoms rather than diseases being certified.*—Familiar examples of this form of defect in certificates are ascribing the causes of deaths to jaundice, dropsy, hæmorrhage, syncope. Jaundice is, I take it, always merely a symptom, and so is dropsy, even though a place is found for them in the official nosological tables. Surely, in dealing with dropsy, a certifier should do his best to trace the cause. Is it heart disease? Is it kidney disease? Is it liver disease? Is it ovarian disease? Is it a sequela of scarlatina? Is it anæmia or scorbutus? As for hæmorrhage, it may mean almost anything—aneurism, varicose veins, placenta prævia, &c., &c. And syncope, which it is usual to class with heart disease, may after all indicate something quite different.

(e). *Undue reticence.*—This defect probably contributes more than any other to the imperfections of the death returns.

In particular there are three important death-causes, primary causes, which, if I may be allowed the expression, are conspicuous by their infrequent appearance, these are alcoholism, syphilis, and childbirth. According to the returns, I find not one in two hundred deaths is due to alcoholism, a deduction which obviously does not correspond with the facts. Deaths from undoubted alcoholism are ascribed to phthisis, bronchitis, pneumonia, brain disease, cephalitis, apoplexy, paralysis, dropsy, heart disease, Bright's disease, gastritis, enteritis, dyspepsia, stomach disease, hepatitis, cirrhosis, liver disease, &c., &c., without a suggestion that intemperance was even remotely connected with the fatality. Similarly, deaths from undoubted congenital syphilis, are certified as due to tabes mesenterica, convulsions, skin disease, marasmus, atrophy, &c., without a hint as to the constitutional vice, the indications of which are not usually difficult to distinguish. As for syphilis which is not congenital, it would appear as if no one ever did die of this except the inmates of a lock hospital, and an occasional parish patient. Of course it is the easiest thing in the world to account for this *suppressio veri*. Patients and their friends (gentle and simple) are endowed with a more or less acute sensibility, and prone to resent any slur on the family sobriety or continence. Even if it were not so, is there one medical practitioner in a thousand who has the brutal frankness to give a disgusting or offensive certificate to the weeping widow in the first anguish of her great bereavement, or the sorrowing son mourning the death of a parent?

Why a large proportion of deaths from childbirth are not recorded as such is by no means so easy to explain. Indeed, to me it is almost inexplicable. However, this is the fact that year by year many hundreds of deaths from childbirth are certified as due to eclampsia, peritonitis, albuminuria, hæmorrhage, &c., without any mention of the recent parturition. Take my own district: one year I find a total of nine deaths ascribed to childbirth, miscarriage, puerperal fever, &c., &c.; and another year a total of eleven deaths to these causes, *i.e.*, one death in childbirth to 315 births and 277 births respectively; and it is not alleged that Birkenhead is any exception to the rule in this matter. Indeed in most districts, if not all, it would seem that death certificates are unduly reticent on this subject of childbirth, women delivered being certified as dying from various causes, without mention of the fact that such causes followed hard upon childbirth. The mortality in children according to M'Clintock is 1 in 123; and the conclusion of Matthews Duncan, who has investigated this question with great care is very similar, *viz.*: that "not more than 1 in every 120 women delivered at or near the full time, die within the four weeks of childbed."

Having pointed out what I consider the defects in a minority of the certificates of death-causes furnished by medical men, it is well now to make some suggestions as to remedy, before I pass on to the second part of my subject. As regards excess of information, I would propose that when three or four death-causes are entered in a certificate, the writer should indicate how he would have the death classed, by underlining one or other of the causes recorded. As for deficiency of information, using too general terms, and certifying symptoms rather than diseases, all that is wanted is a little more care in writing certificates, and even occasional reference to Dr. Farr's nosology, or the nomenclature of diseases prepared under the direction of the College of Physicians. It would be well also for practitioners to make it a rule never in any case to certify the cause of death as due to exhaustion, coma, apnoea, &c., and to hold that senility or old age, is as a rule an inadequate cause of death for a man or woman aged 60 or under.

In the matter of the *suppressio veri* which seems to be required of the certifier when the cause of death is alcoholism or syphilis, I would remark that the difficulty only arises because it is the custom to give the certificate to a near relation of the deceased. If it were the practice for the certifier to send or deliver the certificate direct to the district registrar, it would be much easier for the certifier to tell the whole truth; and in many cases he would be under no temptation to do

otherwise. I am aware that certifying something less than the naked truth is not always a reserve in deference to mere sentiment, but that certifying alcoholism or syphilis may sometimes invalidate an insurance claim on deceased's behalf. Still, I cannot doubt but that a very slight alteration in the Registration of Births and Deaths Act, requiring the practitioner in attendance on deceased during his last illness to send to the district registrar a certificate of the cause of death, instead of furnishing the same to "a qualified informant of the death," would be a useful legislative amendment, and helpful to practitioners in facilitating the performance of an unpleasant duty. As to the omissions referred to in certifying deaths due to diseases or conditions incidental to tedious or complicated travail, the rule should be to notify the fact of parturition or miscarriage in every certificate stating the cause of death of any woman who may die from any cause within twenty-eight days next following parturition or miscarriage.

One word here as to the obligation on medical men to certify. The clause of the Registration of Births and Deaths Act (clause 20), which I have already quoted, is I think capable of a more liberal interpretation than it usually receives. It may well happen that a practitioner, whose attendance on a patient during his last illness has been limited to one or two visits, may be unable to assign a cause of death. He may indeed have attended deceased for a considerable time, and still be in the dark as to the cause of death. Indeed, death has so many phases, and some are so difficult to interpret, that occasionally even after the assistance of a *post mortem* examination of the body, a practitioner may find that the problem as to the cause of death is still obscure. Under such circumstances, is a practitioner required to certify something? It seems generally to be held that he is, but I am of a different opinion. He is only bound to certify the cause to the best of his knowledge and belief, and in the cases supposed to the best of his knowledge and belief he can assign no cause.

II. DEATH-CAUSES CERTIFIED BY CORONERS' JURIES.—These might be, and should be, as reliable and satisfactory in every way as any death-causes in the registrars' returns. As it is they are most inadequate and unsatisfactory, so that a large proportion of them have to be entered in the summaries under the headings "violent deaths not classed," and "causes not specified or ill-defined."

The verdicts of Coroners' Juries are difficult to classify and comparatively useless for various reasons—that is to say owing to:—

(a). *The only question proposed for solution being commonly,*

Is the death the result of disease, accident, negligence, suicide, murder or manslaughter?" Thus the inquiry is not into the cause of death, but only whether anyone is to blame for the death. The court which aims at doing so little actually does less, and often such verdicts as "found drowned," or "found dead," are returned, and these answer no question, except the question of the competency of the tribunal. I cannot help thinking that Coroners' Juries taking this narrow view of their duties is due to the vast majority of Coroners being lawyers instead of medical men. Whether the deceased died of apoplexy, heart disease or thrombosis, is to the legal mind a matter of supreme indifference. Questions of culpability and negligence are the real issues before the Court, from a legal point of view, and the Lawyer-Coroner is sure to instruct his jury accordingly. Even where evidence as to the actual cause of death is available it is perhaps not called, or if called misunderstood. This brings me to another chief cause of the unsatisfactoriness of the verdicts of Coroners' Courts.

(b). *The evidence of a medical witness is only occasionally required.*—Holding an inquiry into the cause of death, without any medical evidence whatever, as is so often done, is a travesty. It is like celebrating a wedding without the groom. The result cannot but be barren and unfruitful. Omitting to require medical evidence is in part due to legal, and sometimes medical, Coroners not comprehending the necessity for it, and in part prompted by a wish to save the county or borough rates where practicable. The fee of the uncalled medical witness is saved, but owing to this saving the fees of the Coroner and Jurymen are lost. Economy of this kind defeats itself. For similar reasons

(c). *A post mortem examination of the deceased is seldom ordered.*—Were medical evidence called at every inquest, and a *post mortem* examination of the body the rule instead of the exception, what a very different value one would attach to the findings of juries. I am not prepared to assert that a *post mortem* examination is necessary in every case; but I would have a medical witness called in every case, and practically it should rest with him to say if such an examination were needful. As it is, the Coroner orders a *post mortem* examination only when he thinks it is required, and it often happens that he is incompetent to decide such a question, seeing that few Coroners are qualified medical men, and not many of these are in practice.

(d). *Such findings as "Died by the Visitation of God," or "Natural Causes" being usual.* To say that such verdicts are useless is to understate the facts, they are harmful because

altogether deceptive. A formal judicial inquiry is held, and when a verdict is given the assumption is, that the investigation has been brought to a successful issue, but such a verdict as either of the above decides nothing. The first is merely a pious admission that providence overrules events; it has no further meaning, for is not death always by visitation of God? A man dies of bronchitis or fever, or is bludgeoned by a burglar; in each case his death is a visitation of God, just as much as if he had been struck dead by lightning. Death by visitation of God is then meaningless, because it is all-inclusive. It is not less or more than the truth, but "the truth in masquerade."

And what shall be said of the other conventional verdict, death from natural causes? This is certainly not all-inclusive. Indeed, very few diseases are, strictly speaking, natural causes of death. The so-called preventable diseases, such as typhus, typhoid fever, and diphtheria, are not, nor are the large group of maladies classed as tubercular diseases. Then the long list of diseases which are the more or less immediate result of intemperance or incontinence, though frequent causes of death, are certainly not natural causes. Indeed it is far easier to say what are not than what are natural causes; yet apparently the term as used by Coroners' Juries simply means that the death was caused in some way other than by violence, *i.e.*, that the death was not the evident and direct result of chemical or physical forces.

(c.) *The little respect commonly accorded the Coroner's Court.*—This is assuredly a cause of the useless and unsatisfactory verdicts recorded. A Court which takes a low estimate of its own functions, and often does its work in a somewhat perfunctory manner, can scarcely command respect. The Coroner is a judge without the authority or prestige of a judge; the Jury is a sort of scratch crew; the court-room is a parlour at a public-house. Sittings are not rarely enlivened by sparrings between the Coroner and the Jury, or a local solicitor. "Crown's 'quest law" is a byword of contempt, and even the censure of the Jury carries no weight. The Court is a relic of very ancient times, and badly needs reform.

III. DEATH-CAUSES UNCERTIFIED.—These are, of course, the least reliable and satisfactory of all death-causes. The cause is communicated to the registrar by the informant who reports the death. The informant is a relative of the deceased present at the death, or in attendance, or dwelling in the sub-district in which the death occurred, or a person present at the death, or an occupier or inmate of the house in which the death occurred, or the person causing the body to be buried; and the information as to cause of death which he communicates is either merely his own personal opinion, or it is vouched for by

a quack, a herbalist, a nostrum-vendor, a midwife or nurse. It is especially noteworthy that a very large proportion (about 90 per cent.) of the uncertified deaths are the deaths of infants and very young children. The causes most frequently assigned appear to be debility, bronchitis, and premature birth. Causes assigned in this way are really valueless for statistical purposes, but assuming that they are proximately true, the questions arise: How many of these cases of alleged debility were due to bad or insufficient food? How many of these cases of alleged bronchitis were due to insufficient clothes or exposure? How many of these cases of alleged premature birth were due to parental vice, or the use of abortifacients? Alas, for the little ones! Yet if the death of an infant may be so easily recorded, and the body buried without any efficient enquiry, is it not offering a premium to all sorts of evil practices? And, unfortunately, owing to the many burial societies competing for the custom of the poor, no mother can remain ignorant that money is to be made out of the sacrifice of these struggling little lives. If proper professional advice is not obtained for an adult when sick, it may be and often is owing to his own default, but if it is not obtained for a sick infant, it is obviously referable to the neglect of others: and so manifold are the means of obtaining free medical relief in the present day that few can plead poverty as an excuse for not procuring skilled advice on behalf of a sick child.

That the causes of many deaths marked "uncertified" are furnished to the informants by irregular medical practitioners is indicated by the causes assigned. For instance, in my own district, during recent years uncertified deaths have been ascribed to the following diseases, among others—rubeola, cynanche trachealis, tabes mesenterica, hydrocephalus, ascaris lumbricoides, laryngismus stridulus, diphtheria, typhus fever, encephalitis, pneumonia, paresis, enteritis, cirrhosis, hypertrophy, atrophica and foramen ovale persistent. These terms, and such as these, could only be employed by persons laying claim to some knowledge of medicine. Indeed I know for a fact that some quacks fill in, sign and deliver regular certificates; and if the main contents of such a certificate are entered in the register, what does it matter to the quack whether his name or the word "uncertified" completes the entry? The quack's certificate is received and his diagnosis adopted by the powers that be. Will his customers after such testimony ever venture to doubt that he is duly qualified? Once in my district the cause of death, "uncertified," was attributed to suppression or retention of urine. If the certifier had himself treated the case, he must have an amount of assurance rarely surpassed.

What then is the remedy for the defects in the registrars' returns which result from uncertified death-causes being entered in the easy way now so common? The problem was solved nineteen years ago by Mr. (now Sir John) Simon. In his eleventh report to the Privy Council, referring to knowledge which ought to be had concerning the deaths of the population, he writes:—

"First, in my opinion, the law ought, as far as practicable, to require in every case of death that the cause of the death be medically certified. Exception, not in substance but in form, might have to be made for cases where Coroners' Inquests are held; *i.e.*, the verdict of any such inquest must, of course, be understood to include the substance of any required medical certificate. And possibly, for very exceptional circumstances, it might be desirable to provide that, in them, any magistrate's order should exonerate from the necessity of the certificate. But, subject only to such qualifications as these, it seems to me that in all cases of death a medical certificate of the cause of death ought to be required; a certificate to be obtained, where practicable, from the medical practitioner who attended the fatal illness; or, where there has been no medical attendant, or none from whom a certificate can be obtained, from the public health-officer of the district."

Somewhat similar advice is tendered by Dr. W. Farr in his letter to the Registrar-General on the causes of death in 1867. His words are:—

"Where death happens in such circumstances as render it impossible to obtain a satisfactory certificate from a medical man in attendance, the cause, I submit, in the interests of science and of human safety, should be investigated by a medical officer specially appointed in each registration district."

Had effect been given to either of these proposals in the Registration of Births and Deaths Acts (1874), as might and should have been done, there would have been no occasion to complain of the imperfections of the mortality statistics due to uncertified deaths. What has thus been suggested is actually in practice in some towns in the United States. In Boston, for example, the city physician (the local health-officer) is required "to report to the city registrar, when requested by him, the causes of death of all persons dying with no physician in attendance."

Gentlemen, the topic I have selected is not unimportant, and may be considered from many points of view; I commend it to your careful attention. In the brief space allotted to a paper, I have been able to do no more than introduce my subject. I trust that many present may be able to add the

results of their experience, knowledge and judgment, and that the discussion may not be unproductive.

Professor W. H. CORFIELD (London) said that they were much obliged to Dr. Vacher for his most important and valuable paper. It was on a subject with which they all had to do, and they could sympathise with him in the difficulties he had experienced in assigning to deaths their right places in the mortality tables, although for his own part he had had no such difficulty for some years. The late Medical Officer for the City of London had fallen foul of the Registrar General and declined to forward the returns. The result of that had been that his Local Authority decided to have only returns of deaths from communicable fevers and from diarrhoea, but to have these direct from the Local Registrars without any delay.

Dr. HARRIS (Birkenhead) said what would help them more than anything else with regard to the uncertified deaths, was the suppression of the herbalist and quack. In the earlier quarters of last year, Birkenhead stood second or third highest on the list in the percentages of uncertified deaths; he at once communicated with their Medical Officer, and was informed it arose from the large practice of an irregular practitioner possessing some bogus degree. That man, not through any medical difficulty, but by reason of some offence against the moral law, got into trouble and was sent to prison; the next quarter the uncertified deaths fell fully fifty per cent., clearly illustrating the large share this element bore in the unsatisfactory certification of the cause of death. He thought Sheffield, Oldham, and Halifax now stood high in the list, and the views of representatives of those towns on the subject would doubtless be listened to with interest.

LORD BASING, F.R.S. (London), said some of the observations of Dr. Vacher reflected upon the provisions of the Registration Act of 1874. Of course that Act might require amendment, but he could only say that the points alluded to as to who should be called upon to certify the cause of death, and in what relationship the medical practitioner should stand to the near relatives of the deceased, had been most anxiously considered, and that the section quoted had been made out after careful enquiry, and the weighing of all the circumstances adduced. In addition there had been a good deal of consideration with regard to the classification of diseases, and how far it should be made incumbent upon the medical practitioner to certify in accordance with the classification, and if he remembered aright, it had been pointed out that there was a good deal of difference of opinion as to classification, and that it would never do to oblige the medical pro-

fession to adopt one or other of the suggestions made. He believed Dr. Farr's was most in vogue, and he understood that some diseases had taken a different aspect or had been attributed to different causes of late. As a matter of criticism however, he should like to point out that Dr. Vacher began by the admission that in 90 per cent. of the cases that came under his notice the medical certificate had been given, and therefore his observations on the shortcomings of Coroners and Coroners' Juries and the unsatisfactory character of the certificate to which no medical man subscribed, to which he entirely agreed, only applied to the remaining ten per cent., a fact from which he certainly took comfort. If the Registration Acts had brought about registration to the extent of 90 per cent. by medical men, the achievement had been a great one, and the effort ought not to be overlooked or regarded as futile. With regard to the law as to Coroners and Coroners' Juries, its condemnation had been general for years and years past. Everybody knew it required to be thoroughly reviewed and reconsidered, and he supposed the time would come when legislation would be attended to in this direction. The appointment of Coroners, the places where inquests should be held, how certificates should be given, and whether the Medical man's opinion should be sought would have to be considered, and one only wondered that anything so irregular and unsatisfactory had been allowed to go on so long unamended. It was also a subject of consideration whether there should be, as indicated in the paper, a medical gentleman appointed to every district, whose authoritative certificate should in all cases be required. They now had a Medical Officer in all districts over the country, and whether he might take a more authoritative part in the obligation of providing a complete registration of disease was a matter very well worthy of attention. They scarcely knew how the profession generally would take the proposal, but the time was come when some arrangement of that kind should perhaps be adopted. At all events they would agree with his remark as to the status of the Medical Officer, and although there was an indication of jealousy as to the Medical Officer regarding himself as a state servant, yet if the improvements in their public health administration were to go on, something more in that direction might be expected.

Dr. ALFRED CARPENTER (Croydon) said the paper was one which commended itself to the audience, and he was very glad they had the presence of the late President of the Local Government Board, that he could hear what might fall not only from Medical Officers of Health but from others who, like himself, did not occupy that distinguished position. He would only deal with three or four subjects referred to. He hoped to see the Medical Officers discharging more important and more onerous duties than they had yet done. The question as to Coroners and Coroners' Juries was one which, to his mind, must be dealt with in any Local Government Bill brought before the country. There was a suggestion made that Coroners should be medical men. It was thought by some that Coroners' Inquests should be held by medical men because a question as to the

cause of death came into play in every case. He doubted whether it would be to the advantage of science or the medical profession that such a course should be adopted, but he was prepared to support a proposal that every Coroner should have at his command the services of a thoroughly and highly educated medical practitioner, who should sit by his side in his Court and act as an assessor; and he (Dr. Carpenter) contended that that man ought to be the Medical Officer of Health, who should have charge of an area large enough to provide a sufficient salary. The question of registration of death was also connected with the office he held, but whilst it was required that every death should be registered, it did not follow that there should be a public notification of the cause of death, which might in some instances be offensive to the relatives of the deceased. It would be to the advantage of medical science if the cause of death certified by the medical attendant should be sent direct to the Medical Officer instead of to the local Registrar, and that the causes of death so registered should be distinct from the fact of the death itself. Dr. Vacher referred to the difficulties of registration in consequence of the obscurity of the language used, and the difficulties that he had in appropriating each to its particular column. He was afraid that this was a general complaint, and expressed his disapproval of the terms employed in the nomenclature issued by the College of Physicians, giving its hundreds upon hundreds of causes of death in directions which were practically useless for scientific assortment. This was anything but satisfactory to him and did not reflect much credit upon the College, because there were cases in which the real cause was completely hidden. Take cases of death registered as pneumonia or bronchitis, which meant nothing but a local manifestation of some general disease; and a case of death from pneumonia was often registered as a lung disease, which might have been caused by syphilis, by alcohol, by rheumatism, by gout, by tubercular disease or by some miasmatic influence producing the general class of fevers. The cause of the disease was the matter of importance: the question whether its local manifestations were lung or heart was of no moment compared with the conditions under which the disease arose. Dr. Vacher alluded very forcibly to alcohol as a cause of death: it showed its influence in diseases of the liver, the kidneys, and other organs of the body, and until they knew something as to the end and the commencement of the disease, and the particular conditions that first arose, the local origin was of very little importance. Under the circumstances he had described it would be a great advantage to science if they could get a more simple nomenclature of disease than that issued by the Royal College of Physicians, which was more closely connected with fashionable diagnoses than with science. Dr. Carpenter then said he was led to make these observations because he did not belong to the Medical Officers of Health, but he did anxiously desire to see them occupy that high position as disease preventors which it was their duty to hold, in order to take every measure in their power to prevent the development of disease whenever and wherever practicable.

Mr. S. W. NORTH (York) said that it seemed to have been forgotten that the whole basis of their position and knowledge in this matter was the Registration Act and the results of it; and that without it, it would be quite impossible to approach the question of the statistics of disease, or of the general causes of death prevailing throughout the country. Whilst they spoke of minor defects, they must not be understood to be condemning the Act generally. They must also bear in mind that many of the faults complained of were not faults of the Act, but faults of the profession. He had had an opportunity some years ago of examining the death returns at an early period of such registration, and the difference between then and now was astonishing. He did not think any of them could hope to get the certificate as precise as Dr. Carpenter's observations seemed to point to; that was for the future of medicine. Dr. Vaucher referred to alcohol as being seldom recorded as the cause of death. Alcohol produced its evil effects by causing disease, but he did not know that the medical attendant was always in possession of facts to show that alcohol was the cause of pneumonia or other diseases, and thus to certify it as the actual cause of death, although they had good sound ground for believing that alcohol did kill a large number of people, their knowledge was not then enough to assign alcohol as a cause of death in the same way as they might with other poisons. The zymotic causes of death were scarcely sufficiently known to form the basis of certification. As to the Coroner's Court, the object was not so much to enquire into the cause of death as they understood it medically, as to get at the cause socially. So long as the law was as it is, the Coroner's Court would be satisfied by asserting that the cause of death had been proved to be due to violence, natural causes, or otherwise, without being more specific. With regard to uncertified cases, the Officers of Health should be asked to make a personal enquiry, and to report to the Coroner; this would bring about a greater and increasing accuracy in those cases; he certainly thought they might aid the Coroner by investigating these cases. They could not hope to attain to a knowledge of the remote cause of disease, and could not blame the Coroner for this inability. The certification of deaths had rapidly improved, owing to the fact that they were overhauled by competent persons, and that this fact was generally known. Improved notification of the cause of death rests rather with the medical profession than the law; want of clearness greatly impairs the value of the certificate for the purposes of public health and scientific medicine.

Dr. J. F. J. SYKES (London) said it appeared to him that the point was to get a more accurate certification as well as a more scientific definition of disease, so that they could properly classify it. One of the difficulties was that extraordinary terms were used, and that, not in proper order. It was the custom in classifying, to select the zymotic cause first as the primary, although not so stated, then to select the constitutional, thence they passed on to the local, then to the developmental, and lastly they fell back upon the symptomatic. The

underlining process giving prominence to a particular disease or cause of death was not sufficient for him. It ought to be an orderly process which he would describe presently. He thought the suggestion that the certificate should be sent direct to the Registrar, would assist very materially in getting more correct certification. The Coroner had at present two functions, he had originally one—the social function—but now he had the medical function of defining disease, as well as the function of defining the social cause of death. These two points could very well be met by appointing a medical assessor, and in his opinion this should be done, as the medical question should not be strangled by the legal one. This brought him to the finding of Coroners' Juries. The Coroner as well as all others certifying, ought to be bound to certify apart from the verdict according to a fixed certificate. A year or so ago, he proposed before the Medical Officers of Health Society, to improve the death certificate, but the matter appeared to have been under consideration ever since. The mistakes as to the *primary* and *secondary* cause of death were very frequent, and he would suggest that the certificate should have three distinct items:—(1) "Immediate cause of death"; (2) "Proximate"; (3) "Predisposing"; and the duration of each cause. If they had a certificate of that form in which all were bound to certify, a more accurate record would result from the Coroner as well as from medical men generally. Although only ten per cent. of the deaths were uncertified, probably fifty per cent. were certified in an unsatisfactory manner, largely owing to the form of certificate, and proper certification was the basis of proper classification.

Dr. MEACHAM (Manchester) said he was a poor law officer at Manchester. He believed a great deal of truth to be suppressed in death certificates. He had had numbers of deaths against which if he had written alcohol he would have been correct, and he believed there were many deaths arising from alcohol which were in no way known so far as the death certificate was concerned.

Dr. VERNON (Southport) said that the certificates had been described as perfectly useless, as had all the statistics based upon them; but his experience was that they were completely satisfactory for administrative purposes. But as regarded classification, he sympathized strongly with Dr. Vaucher, and thought the members of the medical profession were mainly, if not entirely, to blame for any difficulty that arose from these causes. A vast improvement had taken place, but as they were aware, there was still room for further advancement. It seemed to him that the less complicated a certificate was, the better it would serve its purpose; and although Dr. Sykes's suggestion was a very ingenious one, he hardly thought it was adapted to the average intellect. Elaborate details as to the sequence of systems were not wanted: what was really wanted was the *killing* disease. He was strongly in sympathy with the suggestion that the Coroner should have at his command a medical man as assessor, and that the assessor should be the Medical Officer of Health.

He thought it quite necessary too that there should be more attention paid to the qualifications of those who are selected to conduct post mortem examinations, for it appeared to him that many men engaged in the hurry and bustle of general practice were scarcely possessed of the minute and accurate chemical and pathological knowledge required by a witness at assizes.

Mr. ARMSTRONG (Newcastle) said that Dr. Vacher's paper was full and suggestive. To his mind, the criticisms in it were severe, but just, and such as every Medical Officer of Health would confirm. Feeling that the discussion that morning would be incomplete without practical action, he would propose a resolution, which, although it did not go so far as his own opinion, would, he believed, fairly embody the general sentiment of the meeting. Individually, he considered that in large towns the Medical Officer of Health was the proper person to fill the office itself of Coroner; but without prejudice, he moved the following resolution, which was a step in the right direction, viz.:—"That in the opinion of this meeting, the appointment of a registered medical practitioner, and, where practicable, the Medical Officer of Health, to the office of assessor to the Coroner, is likely to be advantageous to the public by conducing to a more accurate return of the cause of death in suspicious and uncertified cases."

Dr. J. TATHAM (Salford) seconded the resolution, and said he desired to allude to one aspect of the question which had not been previously touched upon, namely—what was to be the future position of the Medical Officer of Health in regard to it. At present when that officer devoted the whole of his time to the duties of his office, he was nothing more nor less than the Registrar of his Committee. He had not the position which a highly educated man ought to occupy. They had heard described that morning some of the duties of such an officer, but Mr. Armstrong had fully set forth in an excellent paper, what in his judgment should properly be the functions of the Medical Officer of Health. He (Dr. Tatham) would recommend those present who had not already done so, to read that paper. By virtue of his position, the Health Officer ought to be in reality the guardian of the public health, not simply a carrier out of resolutions of Committees. He ought to be the recipient of the death and sickness certificates of the medical men, and it should rest with him, to say whether inquests were necessary in certain cases, instead of with the Registrar as at present. Another serious matter had been omitted from the paper, and that was, that according to the law no registration of still births was necessary. They knew that a very large proportion of children were certified informally, on bits of paper, as having been still-born, by midwives and other ignorant persons present at birth. In the speaker's judgment, that was not a state of things that ought to be allowed.

Dr. KENYON (Chester) said he had listened with considerable impatience to the references to the office of Coroner, and the idea of

combining it with the duties of Medical Officer of Health. The existing duties of each officer were sufficiently onerous, and it was ridiculous to think that an officer could advantageously discharge the duties of both. He was particularly opposed to the Medical Officer of Health, as such, being called upon to undertake any enquiry into the causes of uncertified deaths. Such enquiry would be utterly useless, unless witnesses could be examined on oath and under formalities, *i.e.*, so far as it could be conducted by a man in the position of Medical Officer of Health. A policeman or detective might go about amongst people and collect information, which might afterwards be tested in a court of law; but a Medical Officer had quite enough to do in his own department, and he deprecated the tendency of speakers advocating the annexation of duties belonging to other departments foreign to its scope. He thought however a medical man was quite as well fitted to be a Coroner as was a lawyer; it was clearly intended to be for the purpose of making an enquiry in a common sense, rough and ready practical way for the people by one of the people.

Mr. MACASSEY, though neither a medical man nor a lawyer, asked permission to speak, and was allowed. He thought the view he took might be considered an impartial one. It was a fact that often the Coroner's Court was the ground for ridicule, but one reason for this was forcibly pointed out by Mr. North. The real object of the Court was to determine whether or not the death had been caused in such a way that any one was criminally responsible. Who was the best man to preside over that Court? The Jury brought in the verdict, but it was the duty of the Coroner to put the facts clearly before them. He contended that the lawyer was most suited for the office, inasmuch as he was best accustomed to weighing and dealing with evidence. The lawyer could always have competent medical witnesses, and therefore he did not see the necessity for passing that resolution nor the need that a medical man should even be the assessor. As to the classification of the causes of death, he thought the proposed simplification would be found difficult to accomplish, although Dr. Sykes had struck a keynote in giving the immediate and proximate causes of death, for by these they would see at once what was the cause of death. It was always difficult to put into simple words the multiple meanings often necessary in the classification of death causes.

The conference then adjourned. The afternoon proceedings were conducted under the presidency of Dr. Tatham, of Salford, Professor Corfield having to leave to attend the Vienna Congress.

Immediately on resuming, the following amended resolution was moved by Mr. Henry E. Armstrong (Newcastle-upon-Tyne), seconded by the Chairman, and carried unanimously:—"That the Council of

the Institute be recommended to consider the desirability of the Medical Officer of Health acting in the capacity of assessor to the Coroner in all cases of death in which there has been no medical attendant, or none from whom a certificate of death can be obtained, and that in such capacity it should be the duty of the Medical Officer of Health to make full inquiry into all cases of suspicious or uncertified death."

Dr. F. VACHER (Birkenhead) said all the gentlemen who had spoken, appearing to be in favour of the proposals made, he had not much to say in reply. With reference to the remarks he made upon the Registration of Births and Deaths Act (1874), at the time they were written, he had not expected that Lord Basing (who was instrumental in framing the Act) would be sitting by his side to hear them read. He desired to say he appreciated the value of the Act as a whole, and he wished Lord Basing were present to hear him say so; it was through this Act that the causes were duly certified in ninety per cent. of the deaths registered; but, as might have been expected, thirteen years' experience of the Act had shown its imperfections. He had been asked to say why he had not called his paper "Death causes and their certification"; the word "classification" appeared to be more comprehensive, especially as he was dealing with deaths certified and uncertified; it was the difficulty in classifying death causes that made careless certification a medical officer's question.

On "Provision of Fever Hospitals for Rural Districts," by
G. A. KENYON, M.B., L.R.C.P.

ABSTRACT.

Dr. KENYON pointed out that Rural Districts vary much in character. In places surrounding large towns they were frequently of a suburban character, and on the sea coast had a large floating population of visitors. In such localities, Hospital accommodation for Infectious cases was imperatively needed, not necessarily of an expensive character, but once

established the outlay would speedily be justified by the advantages appreciated.

In purely Rural Districts, on the other hand, there is less call for Hospital accommodation, and greater difficulty in providing it. The case is sufficiently met by having available access to an Infectious Hospital within, say, ten miles; and such an Institution, where not already existing, should be established by a combination of districts within such radius.

The four-roomed cottage, which in theory should be such a ready means of isolation easily obtainable in every village, in practice is an impossibility. In a case where a sanitary authority resolved to act on this suggestion, it was discovered that the accommodation which a four-roomed cottage would afford was so incomplete compared with the relative cost of putting up a building specially arranged for Fever cases, that the latter course was adopted. A site had been presented by a benevolent landowner for such a purpose, consisting of three-quarters of an acre of land, in a suitable position. The plan adopted was that of a detached cottage for caretaker and cooking purposes; a block consisting of two rooms, each of 4000 cubic feet capacity, with nurses' room between; and behind, a shed for ambulance, washing, &c. Building materials ten years ago were considerably dearer than at present, but the whole cost of structure, furnishing, &c., was close upon £1000.

It was at first somewhat doubtful how far the Hospital would be utilized, and during the first year or two no cases were admitted. But any misgivings on this score were in time dissipated, and last year (1886) twenty-three cases were under treatment (during 1887, thirty-two); and the advantages of isolation are shown by the complete arrest of the spread of infection in the neighbourhood, which is a popular watering place, and therefore specially subject to its introduction.

The working expenses of a small Hospital are naturally disproportionately high, and with a view of diminishing these, and increasing the Hospital accommodation of the district, the need and advantages of which having been thus demonstrated, the sanitary authority have combined with four adjoining districts to erect a central Hospital. The district has been formed for this purpose under a Provisional order, which has since received the sanction of Parliament.

On "*Supervision of Dairies, Cowsheds, and Milkshops*," by JOHN F. J. SYKES, B.Sc., M.B., Medical Officer of Health for St. Pancras.

By the Contagious Diseases (Animals) Act, 1878, powers were given for the control of contagious and infectious diseases of cattle and other animals, and for other purposes under general and special orders and declarations of the Privy Council, and declarations and regulations of Local Authorities, the Local Authorities in England being—for the metropolis, the Corporation of London and the Metropolitan Board of Works; for corporate towns, the Municipal Councils; for other boroughs, the Commissioners of Police; and for the counties, the Magistrates; the executive officers for enforcement of the Act being special inspectors, officers of the Local Authorities, and police officers. Section 34 of this Act empowered the Privy Council to make general and special orders in regard to cowsheds, dairies, and milkshops, and an order was so made on June 15th, 1885, superseding a previous order made in July, 1879.

By the Contagious Diseases (Animals) Act, 1886, Section 9, the powers and order of the Privy Council under Section 34 of the Act of 1878 were transferred to the Local Government Board, and the powers, regulations, and registers of the Local Authorities in the counties from the magistrates to the Sanitary Authorities; and consequently the enforcement of the provisions under the order and regulations were transferred from the police to the officers under the Public Health Act, viz., Medical Officers of Health and Sanitary Inspectors.

An amending order was issued by the Local Government Board on November 1st, 1886, after the passing of this Act, addressed to the Corporation of London, the Metropolitan Board of Works, the urban and rural Sanitary Authorities, and others concerned, setting out the transference of powers from the Privy Council to the Local Government Board, defining the local authorities, and limiting the penalty for offences to £5 and to 40s. a day for continuance.

The value of the change is obvious since the major part of the milk is produced in the rural districts of the counties, and has hitherto had little or no supervision at its source, where supervision is the more necessary, to prevent disease from being consigned to towns in milk cans and there distributed from house to house.

The control of diseased animals still remains under the police, who when notified communicate with the Local Authority under the principal Act, and with the Veterinary Inspector.

For details and exact wording, reference must be made to the several Acts, Orders, and Regulations, which I have laid upon the table, but to review the subject and to avoid tediousness and inordinate length, the pith of these may be briefly summarised. The Contagious Diseases (Animals) Act, 1878, Sec. 34, gives power to the Privy Council (now the Local Government Board), to make general and special orders for registering dealers in milk, inspecting cattle in dairies, and prescribing and regulating the sanitation of dairies and cowsheds, securing cleanliness of milk-stores, shops, and vessels, prescribing precautions against infection or contamination, and authorising Local Authorities to make regulations.

The order of the Privy Council (now the Local Government Board) of June, 1885, directs milk dealers to be registered, the Local Authority to keep a register, the registration not to license buildings nor to prevent the enforcement of any Order or Regulation, the Local Authority to give public notice of requiring registration and mode of registering, makers of butter and cheese only, and persons keeping cows for private or neighbourly accommodation to be exempt, new buildings (of which one month's notice is to be given) not to be occupied unless the sanitary arrangements are to the satisfaction of the Local Authority, no building to be occupied unless the sanitary arrangements are proper for the health of the cattle, the cleanliness of the vessels, and the protection of the milk, infected persons to be excluded from contact with cows, vessels, or milk, structures liable to emit fecal emanations to be excluded from the buildings, sleeping where milk is kept prohibited, swine to be excluded from the buildings, milk from a diseased cow to be kept separate and not to be disposed of as human food, and not as food for animals unless boiled, and clause 13 of the Order gives power to the Local Authority to make regulations for the inspection of cattle in dairies, for prescribing the sanitary arrangements and management of dairies and cowsheds, for securing cleanliness of milk stores, shops, and vessels, and for prescribing precautions against infection or contamination.

Under this clause Model Regulations have been issued by the firms of Knight, Shaw, and Haddon Best, and I believe have been approved of by the Local Government Board. The Metropolitan Board of Works possess Regulations which have been in force some years, and the Society of Medical Officers

of Health are at the present moment preparing Model Regulations. In framing Regulations, any or all of these form useful references. They vary much in detail, and the only satisfactory way of treating the subject, will be to state the main provisions and then to view in detail the points advisable for the protection of milk, leaving questions of limitation of the individual bye-laws to the decision of the Local Government Board, and bearing in mind that the more the Regulations of any particular Sanitary Authority enter into detail, the less discretion is left to the Medical Officer and Sanitary Inspector, and *vice versa*.

The Regulations made under the Orders, and the Orders made under the Acts, it is to be presumed are all to be read together as far as compatible, and it is therefore advisable for Medical Officers to be familiar with the Acts; and the Orders and Regulations may with advantage be printed together.

Sec. 9, sub-sec. 4, of the Act of 1886 should be carefully read, it concerns the power of entry, and indirectly points to the officers. The Local Authority and their officers are thereby given the power of entry under the well known Sec. 102, of the Public Health Act, 1875; but there are no powers there or elsewhere to appoint special officers to carry out these orders and regulations. Although Knight's bye-laws speak of any other officer specially authorized by the Sanitary Authority, it would be any other officer of the Sanitary Authority specially authorized, a different construction; so that the duties fall upon the Medical Officer of Health and the Sanitary Inspector, without any apparent necessity for special appointment, and sub-section 4 gives them the power of entry. But a provision is added to this sub-section by which in a declared infected district they are excluded from any cowshed or other place in which an animal affected by disease is kept, except by permission of the Local Authority under the principal Act, *i.e.*, in the counties, the magistrates.

The main provisions of the model regulations include, as to cowsheds and dairies:—

Inspection.—The Medical Officer of Health, Sanitary Inspector, or other officer, having obtained access, is not to be obstructed nor refused assistance.

Lighting and ventilation to be sufficient and proper.

Air-space for cows not to be below a certain limit.

Cleansing as often as necessary.

Drainage to be effectual, the inlet to the drain to be outside the shed or building.

Water supply to be of good quality and sufficient in quantity.

Milkstore or shop to be cleansed as often as necessary.
Milk-vessels to be cleansed with hot water or steam immediately after use, or after being returned, and to be kept clean when not in use.

Infection or contamination of milk to be provided against by avoiding the storage of milk in a room or place exposed to foul emanations or to risks of infectious disease, and by properly disinfecting and cleansing vessels used by an infected person or at an infected house.

As milk is the most perfect, and at the same time the most perishable food we possess: when pure, most beneficial in sustaining vitality, and under adverse circumstances equally powerful in injuring health: the object of supervision should be so directed as to prevent contamination, and at the same time to avoid hampering production.

The opportunities for contamination are numerous—in milking, in conveyance to depôt, in transit by rail and road, or in delivery. Previously to reaching the consumer it may take place in the fields, the cowshed, the dairy, or the milkshop.

The sources of contamination may be man, the premises and utensils, or cows and other animals.

Man, from the drawing of the milk until its consumption, is more or less in constant contact with it. It is probable that most of the infectious diseases of man can be readily propagated in milk and invade the consumer. And it has not been denied that the principal zymotic diseases can in this way be spread. We have accumulated evidence of the spread of scarlet fever, diphtheria, and typhoid fever. The infection of small-pox, diphtheria, scarlet fever, typhus, typhoid fever, and cholera, are to be specially provided against. For like the seed in the parable of the sower, micro-organisms falling into the cultivating fluid, milk, fall upon "good ground" and there produce more than a hundred-fold.

A general Act requiring the notification of infectious disease, and isolation where necessary, would prove more efficacious than the present piecemeal legislation in preventing the infection not only of milk but of all surroundings to which milk is more or less always exposed. For instance, employés hailing from tenemented houses, purchasers and visitors in the ordinary course of business, and so on.

The ways in which milk may become infected are so multifarious, that nothing short of general notification is of any effectual avail, and the protection afforded by special Orders and Regulations can only be imperfect.

Under any circumstances a dealer in milk should be required to notify to the Medical Officer of Health, the outbreak of

infectious disease on his premises or amongst his employes (if it come to his knowledge) and to remove all milk and utensils from the infected premises, and to cease selling milk until the premises have been disinfected and pronounced free from infection. Unfortunately this does not reach the employes themselves. No milk or utensils should be stored or kept in a sleeping apartment, and no place where milk utensils are stored or kept should be slept in. No utensils from the house of or used by an infected person should be used again until properly cleansed and disinfected.

Premises and Utensils in their structural condition and management can be controlled more easily and more effectually than disease in man or animals, and they form the most satisfactory subject to deal with in regulations.

AS TO COWSHEDS.

The Lighting should be sufficient to light every part of the shed, because light is indispensable to perfect health, and because where there is darkness there is usually dirt; but it should not be excessive, or the cooling effect of large window surfaces results in the blocking of ventilators to maintain the temperature in cold weather. Cows require a temperature variously stated at from 50° to 60° F., and produce most milk at the higher temperature.

Ventilation may be provided in a simple but effectual manner by means of a louvred lantern or other ridge ventilator at the apex of the roof, assisted by hinged windows with louvred sash in the walls about two-thirds of the distance up from the floor of the shed. There must necessarily be an inlet and an outlet under this arrangement, but those who have dealt with inlets and outlets know how impossible it is to decide which will be which; but by watching the wind currents, and by regulating the windows and doors accordingly, the ventilation may be fairly controlled. The ventilation in winter requires gentle handling; it must be remembered that cowsheds are either constructed of wood or brick, or both, and the walls are usually exposed; therefore a considerable change of air naturally takes place through the walls, and the lower the temperature, the greater the change. Consequently it is impossible to fix a size for ventilators, without a knowledge of each particular shed. Very little experience is necessary to judge of the sufficiency of ventilation, and therefore of the size and position of the ventilators. Unfortunately the organic matter does not diffuse equally well, but accumulates; in order to discharge the organic matter, the doors and windows might be thrown open for a short interval once or twice a day, to flush the shed with air.

Air-space.—The Local Government Board have advised the

adoption of not less than 800 cubic feet for each cow. This means a lair of 4 ft. by 8 ft., a gangway of 4 ft. by 4 ft., and a height of 16 ft. plus a small addition of the roof space, for each cow.

Water-supply.—The water should be of good quality, and Section 70 of the Public Health Act, 1875, gives power to close a polluted well, tank, cistern, or pump. The quantity to be provided will include both water for drinking and for cleansing purposes, and the amount required for cleansing will be considerable. It would not be unreasonable to place the amount at half what is usually considered requisite per head for human beings—say 15 gallons.

Cisterns may or may not be necessary, according to whether the supply is constant or intermittent. They should be placed outside the shed, the bottoms at least six feet from the ground, and the overflows discharging into the open. For drinking and feeding purposes *troughs* are preferable to buckets and mangers. In new buildings they should be provided and furnished with a hard smooth impervious lining.

Food-supply.—*Fermented* food should be kept in proper receptacles, not within the buildings, and the receptacles should be periodically cleansed.

Drainage should be effected by the floor surface of the stalls made impervious and with a fall towards the gangway, the gangways being also impervious and with a fall towards the drain inlet, which should be situated outside the building, protected by a grating and properly trapped. Sometimes a drain is constructed under the gangway, in which case it should be disconnected from the drain or sewer outside the building by air and water.

Refuse matters should have drained receptacles provided for them in the open, and be regularly emptied and cleansed. Sunken receptacles or pits for cowshed or stable refuse are always objectionable, the drainage becoming blocked by overlying material converts them into cesspools. The floor of such receptacles should form part of, or be level with, the surface, and drainage should be effected by openings in the sides at ground level.

Cleansing.—The interior, including the walls, roof, and woodwork, should be cleansed at least twice a year; the front six feet up, and sides of the lairs, once a week; the floor, the trough or mangers, and the lairs, thoroughly cleaned out and flushed once a day; and between each milking the gangway should be swept down to remove all liquid filth and dung. Cleansing here meaning scraping, limewhiting, painting, or washing, according to the requirement of the surface.

Utensils should be washed after use, first with cold water and then with hot water or steam. It would be useful provision to restrict receptacles for milk to tin, glass, and porcelain. All cisterns, troughs, pits, bins, and other receptacles and apparatus should be kept in a cleanly condition.

Contamination.—Closets, privies, cesspools, urinals, openings of drains, receptacles for dung, for fermented food, &c., should be excluded from the buildings.

New Buildings.—The "reasonable satisfaction" of the Local Authority, mentioned in clause 7 of the Order of 1885, might include some advance on the "prescribing and regulating," mentioned in clause 13 for old buildings.

Milking.—A useful precaution would be to supply proper convenience for washing the milker's hands and the udders previous to milking. Unfortunately another difficulty arises in the collection of the milk. The milk from various cows is mixed to equalize the quality; milking sick animals is beneficial to their recovery, and milk from cows slightly disturbed in health disturbs the health of man, a logical series of premises of which the conclusion is not difficult to arrive at, although the milk of a diseased cow is prohibited from being mixed with other milk.

AS TO DAIRIES.—Many of the requisites for cowsheds also apply to dairies.

The lighting should be sufficient to enable the operations therein to be easily conducted and to see that cleanliness is scrupulously maintained. The window surface may be as great as possible since coolness is requisite for a dairy, and for the same reason direct sunlight is not desirable. So that it is the position rather than the size of windows that should be considered here.

Ventilation also should be copious and without restriction, fixed louvred ventilators, air bricks and other permanent open ventilators are requisite.

Water supply as in cowsheds should be pure and abundant.

Drainage.—The floor of a dairy is best paved or covered entirely with a hard smooth impervious surface laid with a fall as in cowsheds, and waste pipes should discharge into the open.

Cleansing resolves itself into painting when and where necessary, limewhiting and washing the walls, ceiling and woodwork at least twice a year, washing the fixtures at least every week and cleansing the separating, cooling, washing, and other apparatus, utensils and vessels after use, and the vessels when returned, and keeping all clean when not in use. The cleansing of vessels is best accomplished by washing them first with cold water and then with hot; this is readily done, but the most

complete cleansing is effected lastly by steaming the vessels. The steam acts as a disinfectant, cleanses well, and by its latent heat dries the vessels rapidly. Steam apparatus in a dairy is of great value.

Contamination is to be avoided by admitting only air from pure sources, and as in the case of cowsheds excluding all structures that may become possible sources of impurity. All decomposable organic matters except milk should be rigidly excluded.

New buildings.—In them it might be advantageously provided that the dairy should be used only for the storage and treatment of milk, and that fixtures, apparatus and utensils for that purpose only should be admitted.

The remarks as to lavatory arrangements apply also here.

WHEN WE TURN TO MILKSHOPS, the control is much less satisfactory, especially of miscellaneous shops where milk is sold. The regular cleansing of the fixtures and utensils, and prohibiting them from other uses than the storage of milk, and the periodical cleansing of the shop can be required. But beyond that we must fall back upon the Public Health and other Acts for the sanitary condition of the premises, and it is here that we feel acutely the necessity for the general notification of infectious disease. How much disease is spread by small milkshops selling also other foods and miscellaneous articles, it is difficult to ascertain, and probably we shall never know; it can only be inferred by analogous experiences. Shops that retail only small quantities of milk usually either return the utensils dirty to the milk-dealer, or the utensil is retained to be filled daily by the milk-carrier and only cleaned to prevent souring.

The Order only permits the regulations to deal with the shops and vessels, but it would be very desirable to place restrictions upon the registration of milkshops which should extend beyond these. For instance, there are shops used as thoroughfares for all the occupants of a tenemented house, shops only separated by an apology from sleeping rooms, and shops that sell objectionable miscellaneous articles. It might with advantage be conditional that only foods should be sold in a milkshop.

Under the Order there is no power to refuse registration, except to new buildings, but the Authority must register the dealer whatever action it may take afterwards, and non-registration is illegal. Itinerant vendors possess an opportunity for evasion which must not be overlooked.

The tendency is for large organisations to replace the ordinary milk retailer in the delivery of milk, but the small retailer in squalid neighbourhoods remains unaffected, and that

is a difficult point to handle, while at the same time to avoid interfering with the food of the poor.

As to Cows themselves and other Animals.—The water and food supply of milch cows in pasture is important. The pasture can be protected in some measure under the head of abatement of nuisances, by the cleansing of foul ditches and ponds of stagnant water, and by the removal and prevention of the deposition of noxious refuse, etc.

In sheds, besides good structural condition and management, certain other precautions are advisable. The exclusion of swine is imperative; but whatever may take place in pasture, other animals, especially the carnivorous, are not fit permanent residents in a cowshed, however harmless they may be, temporarily. Quarantine for a reasonable time of newly-arrived animals, is a course which a wise keeper of cows would adopt. The isolation of sick cows, even for the lesser ailments, would be an advantage; under any circumstances it is always in the power of the Medical Officer and Sanitary Inspector to report to the police for the attention of the Veterinary Inspector.

The tendency of the large organizations is not to produce their own milk, but to receive their supplies from independent farmers; and in the latter case, usually no Veterinary Surgeon is retained, as would be probable in the former.

The duties of supervision might be conveniently sub-divided. The clerk to the Sanitary Authority keeping the register, the routine work of the orders and regulations being carried out by the Sanitary Inspector regularly and constantly, and seeking the advice of the Medical Officer in cases of irregularity.

The control of infectious disease in man falls naturally to the Medical Officer of Health, and he should be acquainted with new premises and premises of newly registered milk purveyors.

The control of infectious disease in animals falls to the charge of the police and the Veterinary Inspector, to the former of whom notice would be given. But it would certainly be a power if the Medical Officer could recognize when a cow was in good or bad health, and this seems almost to be inferred in the order by placing the inspection of cows in dairies under the Sanitary Authorities. The infectious "disease," falling to the province of the Veterinary Inspector of a Local Authority appears to be restricted to cattle plague, pleuro-pneumonia, and foot and mouth disease, although Secs. 29 and 32, of the 1878 Act, and Secs. 6 and 8, of the 1886 Act, give the *Privy Council* power over other diseases. As sanitarians we are not justified in restricting the term infectious in any way, for it

still remains to be shown what diseases of the cow and of other animals are, and what are not, communicable to man and to other animals; and whether they are not communicable in a mild and almost unrecognizable form equally as well as when pronounced.

Veterinary Surgeons do not favour ordinary cow practice. When seeking information upon the subject of cows, I was kindly informed by Professor Robertson of the Royal Veterinary College, that although the diseases of cows are taught theoretically, the difficulties in the way of obtaining animals for demonstration were so great, as to preclude practical instruction at the College. So that with his knowledge of medicine a Medical Officer of Health with a work of reference and a sick cow, should be able to form as good an opinion as a Veterinary Surgeon, and with a little observation perhaps a better one. Medicinal treatment is not included in this suggestion but purely diagnosis. The field for the researches of medicine in the influence of the health of animals upon man remains an open and a fertile one.

Dr. J. TATHAM (Salford) said there could not be two opinions as to the intrinsic value of the paper. The subject dealt with was one bristling with difficulties, and he should be disappointed if an important discussion did not arise upon it.

Dr. F. M. CORNER (Poplar) said a paper like this should not be allowed to lie dead until the printing of the Transactions, as to every Medical Officer of Health and every Inspector of Nuisances it would be of extreme value. One means, not noticed, by which milk could become contaminated, was from the possibility of infection from venereal sources. Cleansing of the udders and the hands of the milkers was extremely rarely attended to. If the straining of the milk were attended to, they would find that there was regularly a quantity of dry excreta being transmitted to the milk from the udders, and that this was carried to the different houses. It could be shown that there was great carelessness in the grooming, very little attention in fact being given in the common dairies of London to getting the udders cleanly.

Mr. S. W. NORTH (York) said there could not be two opinions about the obligation the Conference was under to Dr. Sykes for his admirable paper. Coming from an urban district, he was painfully conscious how impossible it was to deal with the great proportion of the milk-sellers of the poorer class under existing regulations: sometimes it was stored in greengrocers' shops, and he had seen it stored in closets adjoining privies. These were conditions it was extremely difficult to prevent under the present regulations; but he thought before long they would have larger and ampler powers than those now in force;

and that one of the very first powers that would have to be conferred upon the Medical Officer of Health would be that of visiting the sources of the milk supply, wherever they might be. That power might even now be obtained by any authority seeking an Improvement Act. A much simpler and more complete plan would be that no milk should be sold within any sanitary area except by licensed milk-sellers, and that these sellers should have a documentary license from the authorities, which should imply that their premises were suitable; that they should be prepared to supply lists of their customers, and to disclose the source from which the milk was obtained, *i.e.*, the farm or other milk purveyor. If that were done, it would be quite possible for Medical Officers to trace the origin of some of the diseases due to infected milk better than they were able to do now. He had this brought forcibly before him last year by an outbreak of typhoid fever he had to investigate. A large number of cases arose with great rapidity. After a time the milk supply was suspected. He obtained a list of the consumers from the small retail dealers, who bought the milk of a farmer and sold it second-hand; he ascertained that nearly all the people obtaining their milk from this one source were down with fever. The particular man who supplied it to the retail dealers resided beyond the boundary of his authority, and he sold it to three persons who sold it again. 120 cases were brought into relation with this single milk supply. At ten o'clock at night he went to the residence of the farmer and insisted on seeing his family. He found three cases of typhoid fever in the house. The medical man in attendance said he had some doubt as to the nature of the disease, hence the present visit. He went into the yard and found that the milk vessels were kept close to the privy, which was near the well; that the place was very dirty. He obtained possession of some of the milk, and found that it was diluted with ten per cent. of added water. All this action was irregular, if not illegal; but he did it, and he did something more. A large portion of this milk was sold by a dairy company, who gave him a list of their customers. He told the master that he was spreading typhoid fever, and that he must stop it; his managing director, who lived fifty miles away, wanted to know by what authority he had taken the course he had, remarking that he would consult his lawyer; he replied that he had no legal authority for what he had done, but at once informed him that if he did not immediately stop the sale, he would write to the newspapers saying that he was selling poisoned milk, or otherwise advertise the fact. They might be sure that no proceedings were taken against him. It was wrong, however, with the knowledge they had of how disease could be spread by infected milk, that he should have had to take these irregular methods and subject himself to possible trouble. Medical Officers ought never to rest satisfied until they were in a position to direct that no milk should be sold except from premises in a good sanitary condition, and to compel milk-sellers to state the sources of their supply, and themselves have the right to visit and inspect them. This power, as he had said before, could now to some extent be obtained under Mr. Slater Booth's clauses, which had recently been extended.

Dr. E. W. HOPE (Liverpool) asked Dr. Sykes' experience as to tuberculosis in cows. Was it prejudicial to the consumers of the milk from those cows? Dr. Sykes would of course be aware that the early tuberculosis was exceedingly difficult to ascertain, and that it was moreover very common. Many cows taken from the shippens for slaughter were affected with tuberculosis to a very marked extent. He had gone to the pens and taken the temperature of large numbers of cows, and the temperature of those confined in the shippens ran to 103° or 105°. The temperature of cows was always above that of other mammals, human beings for example. As to the necessity for some system of compulsory notification of infectious disease occurring in milkshops, there could be no two opinions. Over and over again he found out the existence of scarlet fever in cowsheds or milkshops where children were lying ill upstairs, and the mother in attendance in the sick room, which she would leave to serve customers. Thus it appeared to him absolutely essential that some system of compulsory notification should be made to apply to milk places. They had regulations in the city of Liverpool with reference to licenses for the sale of milk, but as Dr. Sykes said, the making of absolute regulations was exceedingly difficult; a certain latitude must be left for the Medical Officers and Inspectors to work in.

Dr. MASON (Hull) said the paper showed how imperfectly the order worked, and he did not know of anything more difficult than the administration of it. It was not an occupation with as it were an apprenticeship, and it was remarkably difficult to supervise the cowshed of a person who had not the slightest knowledge of keeping the animals. Both Medical Officers and Inspectors should have a special knowledge of the diseases of animals. In his experience, it was not in the premises of the large purveyors of milk that the disease took place; as a rule, it generally arose on the premises of the small dealer, and these should be carefully watched.

Dr. J. TATHAM (Salford) said he quite agreed with the observation that it was seldom in the establishments of large purveyors of milk that disease originated, but generally in the premises of the petty-fogging milk-sellers, where they found milk stored in the same small apartment with paraffin oil, red herrings, and so forth; the room being, in some cases, separated by a mere partition from a child suffering from scarlet fever. No doubt disease was frequently spread in that way. In Salford they had one large firm of milk purveyors who adopted a good plan to ascertain whether the milk supply was free from infection. This was an enterprising and a prosperous firm, who made arrangements with the Medical Officer of Health of a large rural district to supply them with information regarding every case of human infectious disease which he knew to exist on the premises of the milk producers concerned. By this means the purveyors made pretty sure that they were not importing amongst their customers milk poisoned with fever germs. This precaution might very well be extended, in the interests even of the purveyors, for it gave their

customers confidence, and accordingly tended to enhance the success of their business. He thought the Medical Officer of Health was paid a guinea for each report: a very handsome payment, they must admit.

Dr. J. F. J. SYKES (London), replying to the discussion, thought the Chairman's remark as to the arrangement with the milk purveyor was a reasonable one; for although every one might notify to the Medical Officer of Health, the milk dealer might be ignorant of disease amongst his employes; he thought that if it were known it would be more generally adopted. Dr. Corner touched on venereal disease. That was one of the points that would be observed by the Medical Officer of Health in the dairy or cowshed: he should not omit to observe the milkers. Dr. North laid stress on the question as touching the poorer classes, and thought there should be some control of the registration of milkshops. The premises ought to be registered, and they should be able to trace the milk from its origin to its final consumption. As to tuberculus disease, he did not wish to enter upon the details of communicable diseases. Whatever disease the animal had, they would find it in one or other of the excreta, and, whether directly or indirectly, it would find its way into the milk. Dr. Hope raised the question of compulsory notification. He should very much like to know the opinion of the Local Government Board upon this question, as raised in the Metropolitan regulations. The Metropolitan Board of Works had compulsory notification, or what they required in their regulations virtually amounted to it. The words in the regulations were: "Every purveyor of milk, or person selling milk by retail, shall, immediately on outbreak of contagious or infectious disease in the house or amongst the persons employed, give notice." The next clause stipulated that every purveyor of milk, &c., shall remove all milk for sale and all utensils, until the same shall have been disinfected and declared by the Medical Officer free from infection. The Medical Officers asked how they were to know it, so long as the notice was sent to the Metropolitan Board of Works, instead of to the District Board. The Metropolitan Board thereupon undertook to notify the Medical Officer. But the other regulations to which he had alluded were unsatisfactory in regard to compulsory notification, no such power being given under the Order. Dr. Mason tried to obtain an opinion on the communicability of disease, but he did not wish to enter into that question. He could not go so far as Dr. Mason, and say that a medical man should be a cow-doctor. What he would say was, that in medicine the first step was to know what health consisted in and what should be its appearance. It was sufficient at present to know that a cow was healthy. Before they could reasonably expect to protect milk, they must have compulsory notification; the next step being licensing of premises where milk is kept. These were the two points.

*On "The Port Sanitary Authority, Liverpool, and its work," by
J. STOPFORD TAYLOR, M.D.*

UNDER the provisions of section 287 of the Public Health Act, 1875, the Corporation of Liverpool have been appointed the Sanitary Authority for the Port of Liverpool, which "commences at the termination of the Port of Chester, namely, at the Red Stones in Hoylake on the point of Wirral, and continues up the River Mersey to Ince Ferry inclusive, being the eastern termination on the Cheshire shore of the Port of Runcorn; thence crossing the River Mersey in a straight line to Dungeon Point, being the western extremity on the Lancashire shore of the said Port of Runcorn; and continues along the coast of the County of Lancashire to a gutter or river of water, commonly called the Hundred-end water, on the south side of the River Ribble, being the southern boundary of the Port of Preston, and shall include all rivers, bays, channels, roads, bars, strands, harbours, havens, streams and creeks within the said limits contained, and shall extend seawards to a distance of three miles from low-water mark along the coast within the aforesaid limit." This is a most extensive area to supervise, but fortunately with the exception of fishing boats at Hoylake and Southport, all vessels have to enter the Mersey to reach the Liverpool, Birkenhead and Garston Docks, so that should there be infectious disease on board any ship information can at once be conveyed to the Medical Officer of Health. To facilitate the working of the order the Corporation of Liverpool have delegated to the Birkenhead Corporation their powers, rights and duties over the Birkenhead Docks and the vessels lying in them.

There is, however, unfortunately, a dual medical authority at the Port of Liverpool, for besides the Medical Officer of Health there is a Medical Officer appointed by the Customs under the old Quarantine Act of George III., which is re-enacted by the Public Health Act of 1875, and states further that "Every vessel having on board any person affected with a dangerous or infectious disorder shall be deemed to be within the provisions of the Act of the sixth year of King George the Fourth, chapter seventy-eight, although such vessel has not commenced her voyage, or has come from, or is bound for some place in the United Kingdom." Excluding the management of cholera ships, which are placed under the control of the Medical Officer of Health by a special order of the Local Government Board,

all other infected ships are to be visited by the Customs Medical Officer, and are liable to quarantine. By the 39 and 40 Victoria c. 36 s. 234, the Privy Council may from time to time require that no person shall land from a ship coming from a place infected with yellow fever or other infectious disease, until the officers of the Customs have examined into the state of health of the persons on board and given permission to land, any person being liable to a penalty of £100 for disobedience. These powers of the Customs, acting under the authority of the Privy Council, are in a measure antagonistic and opposed to the satisfactory working of the Port Sanitary Authority. Section 110 of the Public Health Act, 1875, states that, "For the purpose of the provisions of this Act relating to nuisances, any ship or vessel lying in any river, harbour, or other water within the district of a local authority shall be subject to the jurisdiction of that authority in the same manner as if it were a house within such district." Section 124 states, "where any suitable hospital or place for the reception of the sick is provided within the district of a local authority, or within a convenient distance of such district, any person who is suffering from any dangerous infectious disorder, and is without proper lodging or accommodation, or lodged in a room occupied by more than one family, or is on board any ship or vessel, may on certificate signed by a legally qualified medical practitioner, and with the consent of the superintending body of such hospital or place be removed, by order of any Justice, to such hospital or place, at the cost of the local authority." By section 125, "Any local authority may make such regulations (to be approved by the Local Government Board) for removing to any hospital to which such authority is entitled to remove patients, and for keeping in such hospital so long as may be necessary, any persons brought within their district by any ship or boat who are infected with a dangerous infectious disorder."

It will thus be seen that the local authority has given to it, by the Public Health Act, every power necessary for the inspection, examination, and disinfection of ships, as well as the removal to hospital of infected persons; and further, I may state, the local authority is fully provided with the means and appliances requisite for the proper performance of the duties. Whereas, the Customs officer pays a visit to an infected ship, signs some official documents, and takes his departure. That is all he can do unless he places the ship in quarantine, which is only done when the vessel is infected, or supposed to be infected with yellow fever, and even then application has to be made to the Medical Officer of Health for assistance before she can be released. It is quite time that the Quarantine Act

was altogether abolished, as its powers are useless for any good purpose, and are capable of much mischief by retarding commerce and delaying efficient sanitary supervision.

It may possibly be of some advantage for the Privy Council to retain, through the Customs, some kind of authority over infected ships, but it is difficult to discern their object when, as occurred a few years ago, a large steamship, having many passengers and a large cargo, was quarantined for five days, without having a single case of sickness on board, simply because she had come from a port infected with yellow fever, and had lost three or four persons during the voyage. Surely, if they wished to have an outbreak of the disease, they could not have adopted more likely measures than isolating both passengers and crew on ship board and cutting them off from all outside communication. This course might be followed by Spain and Italy where yellow fever occasionally spreads, but in Liverpool, where the disease never comes and is entirely unknown, it is perfectly absurd. If the Privy Council have reason to believe that yellow fever might be introduced, let them make an order somewhat similar to the cholera order of the Local Government Board, and let sanitary supervision, not obsolete quarantine, be their instruction.

The Port Sanitary Authority has a hospital situated at New Ferry, Cheshire, capable of accommodating twenty-four patients, with sufficient land for tents or sheds, if required, for two or three hundred persons. This hospital has been used for cholera patients only, all cases of the other infectious diseases are removed to hospitals in the city. For the purpose of removal the ambulances and staff of the city are utilised, as well as for the disinfection of ships, and thus a considerable saving is effected by an arrangement with the Health Committee, that the Medical Officer of Health may use any carriage, men, or material belonging to them, instead of keeping a separate establishment, which could only be done at a considerable cost.

Vessels are not quarantined for small-pox, typhus, typhoid, scarlet and malarial fevers. The patients are removed to hospital and the ships disinfected; in fact a vessel is treated in every way as a dwelling-house, the cabins (occupied by the sick and the attendants) are fumigated with sulphur and then well ventilated and cleansed down. The large steamship companies knock down the cabins and burn them, with the beds and fittings, to avoid any risk of contagion being left on board.

When a vessel arrives in the Mersey having, or having had, cholera on board, the Customs authority, in accordance with the cholera order of the Local Government Board, immediately communicates the fact to the Medical Officer

of Health, and detains the ship for his inspection. The medical officer then boards the ship, inquires as to the amount and character of sickness since leaving the last port, examines the sick people as well as the crew and passengers, and if satisfied that the ship is infected, a certificate to that effect is given to the master, who then moves the vessel to the Sloyne, being that part of the river agreed upon for mooring infected vessels. All persons who are well, and not required for the management of the ship, are allowed to land, a record being kept of their addresses. The sick, if able, or as soon as able, are removed to hospital, and the ship thoroughly disinfected and cleansed. In the case of cholera ships which arrived in Liverpool in 1884, every part of them was fumigated with sulphur, the bedding and clothing being freely exposed to the vapours. Carbolic acid was mixed with the water in the tanks and bilges, and then pumped into the river at ebb tide. Most of the bedding and clothing of the sick were burned, the remainder were taken to the disinfecting stoves and submitted to a high temperature for eight hours. All the refuse of the ships, including the ashes from the boiler fires, and the dirt from the bilges, was put on board the Corporation steam hoppers and taken thirty miles out to sea, where it was discharged. As a result of these precautionary measures the disease was stayed, and there were no fresh cases.

For the purpose of carrying out the Sections of the Public Health Act, 91 to 111, relating to inspections and nuisances on shipboard, it is necessary to have an inspector who is as conversant with the construction, management, and condition of vessels as an ordinary inspector of nuisances is with dwelling houses, otherwise he would not be able to report as to the wholesome condition of ships, with reference to ventilation, water storage, bilges, closets, and the condition of the quarters of the crew as to ventilation, lighting, dampness, cleanliness, &c. The Liverpool Port Sanitary Authority have been fortunate in securing the services, as inspector, of Mr. J. J. Brown, who holds the certificate of master, and has been in command of large steamers and sailing ships. Single handed he does a large amount of work in visiting ships, superintending the removal of sick persons, and the disinfection of vessels. Last year he inspected 4,120 vessels, of which 3,844 were found in fair or good sanitary condition, and 276 defective. In 105 the forecastles, peaks, deck-houses, or cabins required cleansing, and painting or lime-washing, and in some of them the forecastle scuttle-doors wanted repairing or renewing. In 12 the bulkheads were faulty, in 91 defective ventilators, in 50 imperfect closets, and in 18 the deck over the quarters occupied by the crews required caulking. It is

a pleasing fact to state that since the appointment of the authority it has not been necessary to take legal proceedings in a single case, the owners or managers being willing to comply with all requirements, and consequently there is a great improvement in all classes of vessels.

The Mersey partakes more of the character of an estuary than a river, and is frequently so crowded with shipping that it would be difficult to appoint a boarding station, as on the Thames or Tyne, for the inspection of all vessels entering the port. Besides it would never do to detain a large steamer without good reason and cause her to lose a tide in docking, as it would entail not only delay but might inflict a considerable loss on the owners. We must trust to the intelligence and honesty of ship masters to give true reports to the Customs officers of the health of their crews and passengers, for it is to their interest that the ships should be freed from infection, otherwise they might have to suffer from the rigorous quarantine of foreign countries. The rapidity with which steamers cross the Atlantic permits the introduction of some infectious diseases during the period of incubation; the disease not being manifested until after the passengers have landed. Many instances of this have occurred, notably where people have landed apparently well and subsequently developed small-pox. This risk must be met by our second line of defence, the good sanitary condition of our towns and cities.

In conclusion, perhaps I might suggest the desirability of ship surgeons being brought into direct communication with the Medical Officer of Health, and that they should submit to that officer full reports of the health of the ships during the outward and homeward passages. This would be an advantage to the officers themselves, as they would thus obtain official recognition of their position and have the support of the Sanitary Authority.

Dr. Masox (Hull) opened the discussion on Dr. Taylor's paper. He said he represented the third port of the kingdom, and should like briefly to allude to the questions introduced into the paper, as to dual control and the inspection of ships. In the port of Hull they had no such thing as a Customs Medical Officer: the control was in the hands of the Port Sanitary Medical Officer at Hull. In listening to Dr. Taylor's paper it appeared to him that at Liverpool they had two antagonistic officers; his experience as to not finding it necessary to resort to legal proceedings to enforce orders on ships, entirely agreed with his own. Their Port Sanitary regulations were developing,

inasmuch as they had recently obtained a provisional order from the Local Government Board, extending their powers in a most important degree. The action of the Local Government Board in this matter, showed the importance they attached to the maintenance of the public health, and to the prevention of the inroads of various diseases through importation. As to the importation of yellow fever he was particularly interested, having recently had an experience of it. The measures taken were these: the Customs immediately on the arrival of the ship notified the illness; the vessel was immediately inspected by the Medical Officer of Health, the persons affected removed to the hospital, and the ship disinfected and released. The question of quarantine was not entertained. Some suggestions had been made with reference to the whole question of quarantine. It had been mentioned by Prof. Corfield that a conference was to be held in London, and it was suggested that those having the jurisdiction of Port Sanitary Authorities in England should be represented strongly so as to urge the best means of dealing with infectious diseases imported into the country. He must say that those who had to administer public health in connection with their shipping, should be well selected. The duties were not learned in a few days; they were only gained by years of experience, and it was highly essential that in these appointments the selection should fall on experienced men. If the duties were thoroughly understood and properly carried out, little difficulty would be experienced in complying with the various Acts of Parliament. As Dr. Taylor suggested, he thought each ship carrying passengers and emigrants should contain a surgeon, part of whose duty it should be to report to the Medical Officer of Health what sickness there had been during the voyage. Suspicious cases should not be allowed to pass unnoticed, and hospital accommodation should be provided for infectious diseases. In Hull, it was one of their systems of inspection that after a suspicious case had been removed for isolation, the ship was visited daily, whilst in the port, by an experienced inspector, with a view to ascertain if any further illness occurred. He sincerely hoped the question of quarantine would not be lost sight of, but would be considered by the International Congress when it met in London; it was important from a medical as well as a commercial point of view.

Dr. J. F. J. SYKES (London) regarded it as an absolute necessity to settle this question of quarantine, concerning as it did not only preventive medicine but also the whole commerce of the country. It was a trader's as well as a Medical Officer's question, and he trusted that at the International Medical Congress the medical profession would muster very strongly and fight the battle of inspection and isolation against the quarantine system. It was necessary to convince Europe that the quarantine system was fallacious, and was breaking down wherever it was established. The eyes of the foreigner were being opened to the fact that the isolation system was not purely a mercenary one. He believed they would be able to prove to the foreigner's satisfaction that the fundamental basis was sanitary. It

was a question of world-wide import, and every opportunity should be seized to press it home.

Dr. J. F. TATHAM (Salford) added his testimony as to the cardinal importance of the matter brought under notice. He regarded it as nothing less than a national calamity that the International Congress of two years ago, despite the weighty evidence of Dr. Thorne, H.M. Inspector under the Local Government Board, found it impossible to convince the representatives of foreign powers that inspection was the right, and quarantine the wrong thing. Every effort ought to be made, at the forthcoming Congress on British soil, to convince the foreign delegates of the desirability of substituting the British scientific principle of medical inspection and isolation of individual sick cases, for the absurd and vexatious system of mere quarantine, which now prevailed in so many foreign countries.

Dr. E. W. HOPE (Liverpool), in replying for Dr. Stopford Taylor, thought every one must be agreed as to the immense superiority of medical inspection of vessels over quarantine. In dealing with every other form of disease, they found medical inspection to answer perfectly well, and there had been no reason to question its efficacy in the case of cholera. In Liverpool they had a fairly good notice, as a rule, of approaching disease, whether cholera or anything else. Persons were removed to hospital when thought necessary, and the ship thoroughly disinfected and cleansed. In regard to dealing with small-pox, the plan in vogue is this: the vessel is boarded in the first instance by the Customs Authorities, and if sickness were found on board they notified the fact to the Health Department; the officers of this department visited the vessel, and removed the patient to hospital and disinfected the ship. In regard to the dual control, disapproved of by Dr. Taylor, the position of the Quarantine Medical Officer was rather curious, because if he visited he could merely certify the nature of the illness to the Sanitary Authority, or their Medical Officer, and had no further powers. Dr. Taylor referred to the importance of having a master mariner to occupy the position of Inspector of Ships. This was a matter absolutely essential, because it took years to gain the requisite knowledge of ships and shipping to say whether a vessel was in a sanitary condition or not. In their case the appointment of a master mariner had been favourably spoken of, and it was likely others would in time follow the same plan. An immense number of emigrants came through from Hull, London or Newcastle, the average for four or five years having been about 150,000. If sickness broke out, they detained a batch when necessary, rather than incur risk of further outbreak.

Mr. S. W. NORTH (York) at this stage asked permission to propose a resolution; it was as follows: "That this meeting wishes to direct the attention of the Council of the Sanitary Institute to the desirability of rendering the Conference of Medical Officers of Health (held for the first time at York) a permanent feature of the Annual Con-

gress of the Sanitary Institute." He had been exceedingly gratified with the two Conferences they had held, and should be pleased to see them made a regular feature. On the subject of quarantine he thought it would be well if the Council could propose some scheme or digest for the guidance of Medical Officers of Health by which those whose duties were in inland districts might the better understand the question and the want of an international congress on the subject being held in England. He would suggest a reference to the best books and authorities on the question as part of the scheme.

Dr. J. F. J. SYKES (London) seconded the motion.

Dr. J. W. MASON (Hull) supported the resolution, which he considered very important; his corporation had great confidence in the wisdom of those meetings, and made him their delegate. He hoped he should always meet them on those occasions and that other corporations would emulate Hull.

Dr. J. TATHAM (Salford) cordially supported the motion, remarking that the fact that it bore Dr. North's *imprimatur*, would go a long way towards its general adoption. The Conferences should be made a separate section of the Institute for the simple reason that they give a practical turn to the whole of its work.

On "*Localised outbreaks of (a) Typhus Fever, and (b) Infantile Diarrhœa*," by E. W. HOPE, M.D., D.Sc., Assistant Medical Officer of Health, Liverpool.

OUTBREAKS of disease of an infectious character, however limited and unimportant they may appear to be, deserve the closest attention that it is possible to give them. Whether the progress of the disease be arrested at once, or whether it take a sufficiently firm hold to constitute a more or less limited epidemic, lessons of the utmost consequence may be learned both in regard to the nature and manner of spread of the disease, as well as in testing the efficacy of the preventive measures employed.

I wish briefly to lay before you an account of one of our localised outbreaks of typhus fever. This disease is one which

is never absent from the city. Since sanitary records of Liverpool have been kept, probably not a week, certainly never a month, has gone by without some cases of this disease being brought to light. During the years of the last considerable epidemic, viz., in 1882 and 1883, the cases were numbered by thousands; but since that date they have undergone a marked diminution, and have dwindled down to some few hundreds annually.

The starting-point of the outbreak to which I wish to direct your attention was with a man named Logan, 56 years of age, who lived at 23 cellar, Menai Street. This man, whose children appear to have been ailing some few weeks previously, died on May 7th, at his home. The disease was not recognised during his lifetime, and it was not until the careful investigation which subsequent circumstances gave rise to, that its real nature became apparent; no suspicion of typhus had been aroused, and the death was attributed to that form of illness which the symptoms appear to have most closely simulated.

The body remained in the cellar in which the man died from the 7th to the 10th of May. There were two circumstances which attracted a number of young girls to this cellar: one was that sweets were sold in it, the other was that Logan's children were girls. Whether these were the causes or no, a number of young girls did go to the cellar, and attended the wake which was held there, several of them remaining a whole night, and others looking in repeatedly during the period that the body was in the cellar.

After the lapse of ten or eleven days, some of these girls, whose ages ranged from nine to fifteen years, fell ill. The sickness being of an anomalous character, it was reported at the Health Office, and, as the result of a close inspection, the following, who had attended the wake, were removed to hospital, suffering from typhus fever:—Mary Welsh, Martha, Julia, and Kate Morgan, Cressy Hamaway, Sarah Simpson, Mary McCormack, Elizabeth Jones, Elizabeth McEvoy, Ann, Lucy, and also Mrs. Duffey.

The inspection of the district was repeated several times, at intervals of a few days. By this means, patients infected by these children were discovered as soon as they fell ill and promptly removed to hospital. By adopting the usual practice in regard to disinfecting and cleaning the houses, the disease was suppressed after a total of about fifty infected persons had been removed and isolated in hospital.

The district is a densely crowded one, the houses being occupied by a very poor and squalid population. The plan, which is in your hands, shows the relative positions of the

streets from whence the patients came. The number removed from the various streets is as follows:—

From Menai Street, 26 Cases		From Broom Street, 1 Case	
" Landor "	... 7 "	" Denbigh "	... 1 "
" Darwen "	... 2 "	" Snowdon "	... 1 "
" Beacon "	... 3 "	" Calvin "	... 1 "
" Milford "	... 1 "	" Bangor "	... 1 "
" Trent "	... 3 "	" Hook "	... 1 "
" Athol "	... 2 "	" Hopwood "	... 1 "
TOTAL ...		... 51 Cases	

Without troubling you with details as to the dates of removal of these patients, I may state that twenty-four of them were removed during the last few days of May, twenty-two during the month of June, and the remainder during the first week of July.

The various elements of danger in this outbreak deserving of special note, apart from the character of the district and the population, are these:—

There is, first of all, the failure of diagnosis in the initial case. The poor man is hidden away in his dimly-lighted cellar, seen perhaps once or twice by the doctor; treatment is directed to the prominent symptoms which seem to have masked the real nature of the disease, and no precautionary measures are adopted.

The next element of danger lies in the fact that *children* were attracted to the wake. We well know that with equal degree of exposure, children are far more susceptible to typhus than adults; had an equal number of adults attended the wake, it is exceedingly probable that far fewer would have been infected. Finally, there is the fact that the symptoms of typhus fever in children are obscure and ill-defined, mild in course, non-fatal in result; differing widely from the characteristics which mark the disease in adults. Hence there was every likelihood that some at least of these ten or twelve cases would escape detection.

The methods employed in this case are the usual ones, the aim and endeavour being to ensure *early* removal of the patient and thorough cleansing of the house. When these means are adopted, and the patient removed, say, before even the eighth or ninth day of illness, we find, as a general rule, that there is no further spread of the disease, but longer delays than this are exceedingly dangerous.

Combinations of chance circumstances, such as those which I have narrated, furnish starting points for an epidemic of the most serious magnitude. My belief is that epidemics of this disease, as well as of some other diseases, do owe their origin

entirely to casual combinations of such circumstances, rather than to meteorological or other obscure conditions which are often supposed to influence them. A dead man in a cellar infects ten of the persons visiting that cellar. These lie for a time in squalid crowded homes, and are in turn the means of infecting others. This process, if not arrested by prompt and vigorous means, must inevitably result in disseminating infection far and wide. One lesson, and a most important one, to be learned from this case, is the necessity for unceasing vigilance on the part of the Health Authorities and their officers.

It was my desire to quote other somewhat similar series of cases, but instead of detaining you on this ground, I would with your permission briefly direct your attention to a singular outbreak of fatal diarrhœa at the Foundling's Hospital, the facts in connection with which are of considerable interest.

The institution in question was originally a large private residence; early in this year it was put in thorough sanitary condition and adapted to its present purpose.

On July 7th there were ten infants in the institution, all of whom were then, and had been previously, in ordinary health. On this date another infant, Lily Kelly, aged two months, was received into the Hospital and placed amongst the other ten. They had a day-ward and two night-wards, but were all together at certain periods of the day. The child Lily Kelly was, on admission, suffering severely from diarrhœa and vomiting, her evacuations being so offensive as to make the nurses sick. Within a day or two of her admission seven of the other infants, as well as the two nurses, Esther Kennedy and Jane Allen, were suffering from diarrhœa. The Matron then separated the four healthy ones altogether from the rest, and these four remained in a healthy condition. In the case of the nurses the diarrhœa lasted three or four days; in the case of the seven infants the diarrhœa, at first trivial, developed into a severe illness: the infants were suddenly seized with acute symptoms, collapse, cramps, and apparently great agony; in each case but one they rallied from this, but exhaustion followed and death ensued in the following order:—

Name.	Age.	Date of Death.	Length of Illness.
Lily Kelly ...	2 mos. ...	July 19th ...	12 days.
Grace Kinsey ...	9 " ...	" 19th ...	6 hours.
Dorothy Smith ...	11 " ...	" 21st ...	5 days.
George Pearson ...	3½ " ...	" 25th ...	10 "
Mary Lee ...	2½ " ...	" 25th ...	10 "
Edward Holloway ...	4 " ...	" 27th ...	8 "
Isabella Wyse ...	17 " ...	" 29th ...	5 "

All of the infants were artificially fed, and great care appears always to have been exercised in their dieting. The same conditions as to weather, &c., existed prior to the outbreak, and the uniformity in symptoms and sequence of cases left no room for doubt in the mind of the Medical Officer of the Institution that these infants were infected in some way by the child Lily Kelly, admitted on July 7th.

With this view I fully concur, since the facts corroborate what I have observed over and over again under ordinary domestic conditions, viz., that when acute autumnal diarrhœa attacks an infant, other infants, or young children, or even occasionally adults, who happen to be brought into contact with the sick one, do themselves very frequently develop symptoms similar in kind, though modified in degree. That effluvia from offensive fecal excretions are capable of exerting a prejudicial influence upon those who inhale them is beyond question; it seems a point of common sense that infants suffering from acute autumnal diarrhœa should be so isolated that their evacuations shall not possibly become a source of infection to the other young children, or other members of the family.

Mr. S. W. NORTH (York) said some two years ago he investigated about a hundred and sixty cases where children had died from diarrhœa, and he found that the cases where there were two sick in one house were very rare; he believed there was an epidemic and contagious form of diarrhœa, but the majority of cases of summer diarrhœa were not of an infectious character.

Dr. J. F. J. SYKES (London) said that in his district typhus was happily unknown; it was purely due to local congestion of a population with insanitary habits, and the remedy was so simple that it was nothing short of a disgrace that typhus should exist at all; and he sincerely trusted Dr. Hope would try to stir up the Liverpool people in this matter. As to diarrhœa, he believed there was a good deal directly due to injudicious feeding. He thought with Dr. North that infectious disease also did frequently exist as a cause, and it was their important duty to try and differentiate between the two; they should not attribute it all to germs in the water, although it was probably one of the many causes, for diarrhœa was only a symptom of various diseases.

Dr. F. M. CORNER (Poplar) said that according to his experience,

which was not great with regard to typhus, it had been due to the habits of the people; certain families would live like pigs, and everything would get into a shocking condition with animal reekage. Undoubtedly this disease arose through crowds herding together, and the filthy habits of this class of people. In gauging the mortality of diarrhœa they rarely found out whether the cases were hand-fed or from the natural milk; it was a great shortcoming in their returns, because many of these deaths should be attributed more to injudicious feeding than to diarrhœa attack.

Dr. J. P. TATHAM (Salford) thought Liverpool ought to be congratulated on the fact that it had an assistant Medical Officer of Health with a remarkably good temper. It was enough to make one's blood boil to read in his report that so recently as the years 1882-3, the cases of typhus were numbered by thousands. He did not think the medical men had acted as they should have done. The Corporation of Liverpool had spent thousands of pounds in rectifying unhealthy areas; the health committee of the city had not been supported as they ought to have been in their effort to provide for the compulsory notification of infectious diseases. The present state of things was a cruelty to the public and to the poor wretches who were exposed to the ravages of this frightful pestilence; it was also an iniquity to the other authorities living outside. It appeared to him that Liverpool acted as a fever manufactory for the whole of Lancashire. They in Salford had frequently cases of typhus imported from Liverpool, and they were undoubtedly prejudiced by the fact that Liverpool did not possess powers for the compulsory notification of infectious disease. The facts stated by Dr. Hope showed the necessity there was for the keenest vigilance on the part of Health Authorities and their officers; they had to run great risk, even of their lives, by their daily contact with typhus and other fevers; and if only for this reason, they ought to be clothed with those protective powers which most other great authorities in England possessed. He felt a little ashamed of his professional brethren in Liverpool, that they would not allow the authorities to obtain these powers. Dr. Hope's paper was a serious indictment against the state of things at present existing in Liverpool.

Dr. E. W. HOPE (Liverpool) said it was certainly a most extraordinary thing that they had in Liverpool such an enormous amount of this disease after it had been stamped out in almost every other town. They had in Liverpool, however, an immense poor labouring population, and notwithstanding the large staff of lodging-house inspectors and sub-let house inspectors, their mode of life was something beyond description; it was shocking to see the manner in which these wretched creatures liked to huddle together. If turned out of one district they migrated to another, and quickly made it as bad or worse than the one they left. He made it a practice not to go into these houses until the windows had been opened for some

minutes, and he gave the inspectors similar instructions. He believed the people of Liverpool would welcome some measure for compulsory notification, and he thought the medical profession would also, did they know of the amount of evidence collected during late years. It might have been that the matter was prematurely brought forward, or that evidence was lacking to show the absolute necessity of it previously; but to his knowledge hundreds had suffered, and hundreds of persons had lost their lives owing to the want of some system of prompt notification. It seemed at one time to be looked upon almost as a point of honour to throw every difficulty in the way of the Medical Officer of Health in this respect; he hoped this feeling was rapidly disappearing. Immense structural alterations had taken place at Liverpool, and it was gratifying to find that the cases were dwindling down from thousands to hundreds, owing to the great sanitary operations carried out in the city.

SECTION II. ENGINEERING AND ARCHITECTURE.

ADDRESS

By PROF. T. HAYTER LEWIS, F.S.A., F.R.I.B.A.

PRESIDENT OF THE SECTION.

IN availing myself of the privilege of addressing the members of the Congress in this active and stirring town, which is spreading itself out in every direction, I have thought it well to bring before them a subject of great interest, but which has not been hitherto much discussed, viz., the extension of our great cities and the erection of new ones; and to suggest such a course as would ensure that such requirements as are now considered to be necessary for their healthful occupation may be provided for at the outset.

In ancient times the creation of a new city almost implied the foundation of a new colony.

In mediæval times towns have risen round monasteries or churches of Bishops,* as Mr. Freeman shews was the case at Wells, Lichfield, and Sherborne; or round a castle, as at Windsor and the Yorkshire Richmond.

But, within our own times, numerous towns, such as Fleetwood, Crewe and Southport, have suddenly sprung into being; whilst, from each of our large cities, extensive suburbs are being pushed out, forming, in fact, new towns.

Of the conditions to be noted in selecting a site for a new city, we have descriptions by writers of all ages, from Vitruvius in the first century to Dr. Parkes in his well-known work of our own time. But this is a subject too large for a short address, and it is of the extensions only that I wish now to speak. They have, almost invariably, been carried out by speculators without any general definite guiding plan, with little or no forethought

* Freeman's "Exeter." p.