

Epidemic diseases and their prevention in the eastern suburbs of Sydney : paper read before the Eastern Suburbs Medical Association of Sydney, January 25, 1895.

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EPIDEMIC DISEASES AND THEIR PRE- VENTION IN THE EASTERN SUBURBS OF SYDNEY.

PART I.—THE EPIDEMIC DISEASES OF THE EASTERN SUBURBS.

The subject which has been chosen for discussion to-night is one that is of the greatest importance to all who reside in or are connected with the Eastern Suburbs. You have been good enough to invite me to open the discussion, and I do so with pleasure, not because I feel competent to do justice to the matter, for I am fully conscious of my shortcomings, but because the subject is one which gives me an opportunity of offering some suggestions which, if adopted, would, I think, lead to a decrease, if not to a total disappearance of preventable disease in our district. At the present time Whooping Cough, Diphtheria, Typhoid Fever and other Epidemic diseases are of daily occurrence in our midst, and I hold that it is our duty as medical men and guardians of the Public Health to prevent the introduction of these diseases, as well as to treat them when they appear.

You will, perhaps, understand the condition of the Eastern Suburbs better if I give you here some statistics relating to the district for the past few years. In the year 1890 the per-centage of deaths to the population was 1.164; in 1891, 1.333; in 1892, 0.94; in 1893 the rate was 1.05. In the year 1892 the Eastern Suburbs had the lowest death-rate for any group of suburbs around Sydney and in 1893 it had the second lowest.

During the four years 1890-91-92-93 the number of deaths from Zymotic diseases in the Eastern Suburbs was as follows:—

DISEASE	1890	1891	1892	1893	TOTAL
Influenza	1	33	5	3	42
Whooping-Cough	7	8	7	6	28
Measles	0	0	0	26	26
Typhoid Fever	9	9	2	4	24
Diphtheria	6	7	4	3	20
Scarlet Fever	0	0	4	9	13

It will be seen that these are the chief Epidemic diseases which have terminated fatally during the past few years, and to these, therefore, I will direct your attention this evening.

INFLUENZA. Although Influenza holds first place among Zymotic diseases as a cause of death in the Eastern Suburbs, it is unnecessary for me to go into the subject here, as the great part of the deaths under this head occurred during the epidemic of 1891, and we are now practically free from the disease.

WHOOPING-COUGH. Next in order comes Whooping-Cough with 28 deaths, or an average of 7 yearly. Whooping-Cough is now very prevalent in our district, and during the month of December 1894, held first place as a cause of illness. It is an exceedingly infectious disease, chiefly affecting young children. The contagium is readily conveyed by the clothes of persons who visit the patients or who may be in attendance upon them. There is little doubt that the disease is spread

by means of schools and by want of proper isolation. Indeed, I am disposed to think that want of proper isolation is the direct cause of the introduction of the disease into our district. Most of the children suffering from Whooping-cough are apparently well in the intervals between the paroxysms and parents, in order to give them fresh air, bring them to the seaside resorts, Bondi, Bronte, Coogee, &c., and with them comes the infection which is imparted to healthy children in the trams or other vehicles by which they travel. It is a popular belief—and popular beliefs die hard—that children must contract Whooping-Cough, Measles and Scarlet Fever at some period of their life, and so no protective steps are taken to prevent the spread of the disease. The consequence is that the epidemic extends until all the susceptible persons exposed to risk have had the complaint, and only dies out for lack of fresh victims.

MEASLES. After Whooping-Cough comes Measles. Strange to say, although the years 1890-91-92 were entirely free from this complaint as regards the Eastern Suburbs, no less than 26 persons (16 males and 10 females) died from it in 1893. You will remember that in 1893 an epidemic of measles occurred in Sydney, and during that year no less than 434 deaths were recorded in the Metropolis, as against 2 in the previous year. When one case of measles occurs in a school the disease is almost certain to become epidemic, as the catarrhal stage, which is usually mistaken for a simple cold, is highly infectious, and no precautions are taken to prevent its spread. Measles usually disappears from the Eastern Suburbs for some years at a time.

The sources of infection in Measles and Scarlet Fever are the morbid products of the skin and mucous membranes. The exciting agents are probably cast off in large quantities; they can withstand drying, they adhere to rags, wash linen, furniture, &c. (Flugge.)

TYPHOID FEVER. In the four years the Eastern Suburbs are credited with 26 deaths. I think, however, that it is quite impossible to take the bare figures representing the number of deaths from this disease and calculate the death-rate for any particular district, owing to the fact that the great majority of cases find their way into the vari-

ous Hospitals for treatment. Typhoid Fever is essentially a "filth" disease. It is held by some that the specific microbe of Typhoid is a spore-forming bacillus, and that these bacilli are expelled from the intestine of an infected person in large numbers, and may remain active for a long period of time. But there is no clear proof as yet that it is necessary for the spore-bearing bacillus to have passed through the intestine before becoming specific. Dr. Wynter Blyth, in his "Manual of Public Health," says:—"Enteric Fever has many a time attacked the traveller in tracts of country in the tropics which are not known to be inhabited, and in numbers of cases in this country the most exhaustive inquiry has failed to show traces of a pre-existent case. Typhoid Fever does not arise *de novo*, for no cunning concoction of filth aided by warmth and moisture will create an Eberth's bacillus, the bacillus has sprung from some pre-existent colony, that colony from a previous one, and so on: but to say that an infective colony must have descended from micro-organisms flourishing in a human body is going beyond existing evidence, the balance of which points in the other direction. The most reasonable theory is that the cause of Typhoid is a vegetable parasite capable of having an independent existence and propagating its kind, and completing its cycle of existence quite independent of the body; probably its normal existence is that of a Saprophyte. Hence its endemic prevalence in certain parts, hence the impossibility of always tracing typhoid from one person to another, and hence the mysterious isolated outbreaks which from time to time occur."

The principal causes of Typhoid, and indeed of all other diseases which are usually termed preventable, are a polluted water supply, decomposing matter and foul air from drains. "Any epidemic of Enteric Fever" says Dr. George Wilson (Handbook of Hygiene) "in a sewer town points to imperfect ventilation, deficient flushing, or to faulty construction of drains, or to contamination of the Water-supply, or to polluted milk. In villages and country districts it points to polluted wells, bad drainage or filthy privies and cess-pools, all of which may originate the disease in the first instance, as well as be the means of propagating the specific contagium when it is developed or introduced." Accord-

ing to Sir John Simon, the causes of preventable diseases may be grouped into two classes, viz., local conditions of filth and nuisance polluting air and water, and reckless dissemination of contagion.

It is held by some bacteriologists in England that Typhoid Fever might spring from epidemic summer diarrhœa, and that the specific organism might proceed from an evolution of the *Bacterium Coli Cummune*. On this matter I do not venture an opinion but merely say that it is seriously put forward in the old country. It is, at any rate certain that many of the causes of acute diarrhœa and Enteric Fever are apparently the same.

DIPHTHERIA. Diphtheria claimed 20 victims in the four years, but these do not represent the full number of those from our district who died of the disease, as many of the uncomplicated cases are sent to the Diphtheria Hospital. The contagium is given off from the throat and breath, but all excretions may hold the germs, and the disease may be spread by means of sewers and water closets. Infection may be caused by means of clothing and bedding, while the furniture, walls and curtains, &c., of the sick room may hold the poison. It is often disseminated through schools and communities.

It is said that there is no connection between Diphtheria and Insanitation. I am not disposed to hold such an opinion, and in declining to accept it I merely echo the words of Sir George Johnson, "no one doubts that Diphtheria is an infectious disease; but that it is often a result of defective drainage, I believe to be as clearly proved as that Typhoid Fever, Pneumonia, Puerperal Fever and Albuminuria may have such an origin." The mortality figures for Melbourne would seem to bear out the opinion that improved sanitation causes a lowering of the death-rate from diphtheria. In 1890 there were 400 deaths from this disease, in 1891 the number fell to 145, and in 1892 to 88, while in 1893 there were only 33.

SCARLET FEVER. After Diphtheria comes Scarlet Fever, as regards the death-rate. Of course it is not to be inferred from this that diphtheria is more prevalent than

Scarlet Fever in the Eastern Suburbs, but that the mortality is greater. It is held by some authorities that Scarlet Fever and Whooping-Cough are antagonistic, and that the two diseases cannot exist in the same locality at the one time. That this is not the case is amply proved by the fact that the two diseases, are now epidemic in Waverley; in fact, I have, at the present time, under my care a child who, while the eruption of scarlet fever was most pronounced, developed the characteristic cough of Pertussis. Scarlet Fever is usually a disease of childhood, not as some think, because children are more liable to the disease, or that age confers immunity, but that it is an exceedingly infectious malady, from which few escape in the earlier years of life, and as a rule a person does not contract it a second time.

Scarlet Fever becomes communicable to others so soon as throat symptoms set in and before the appearance of the eruption, and the infection lasts until desquamation has entirely ceased and the patient's body has been well washed. It is probably the most infectious of all the Zymotic Diseases. It is spread by means of the milk supply, by clothing, books, &c., and even by domestic animals, as well as by personal contact with patients suffering from the disease.

PART II.—PREVENTION OF EPIDEMICS.

Before considering the means to be adopted to prevent the spread of infectious disease, it might be well to dwell upon the means of guarding against an outbreak.

In the first place, how are these diseases disseminated? I will quote a passage from Dr. Sykes's "Public Health Problems." "The indirect ways in which the contagia may be spread are manifold. They may attach themselves to fomites, movable or fixed, from which they may attack the individual through an abraded and exposed surface; or, they may be disturbed and fall or be carried into water or food, and be swallowed; or, may be diffused in the air and be inspired; or they may be conveyed by man or animals, upon the hands,

as in puerperal fever, upon the sheep's back, as in Anthrax, upon the proboscis of the fly as in Ophthalmia. The virus may also enter the body through the direct contamination of water or food by particles discharged from an infected individual, without the intervention of fomites. Those diseases primarily affecting the digestive tract are mainly disseminated in this manner, for example, Cholera, Typhoid, Dysentery. In other diseases the contagia may be diffused in the air surrounding the infected individual, and be inspired by those coming within range. The eruptive infectious diseases are most readily conveyed in this manner, Scarlet Fever, Measles, and others.

Those diseases, the contagia of which are transportable by the air, are necessarily those possessing the greatest power of rapidly spreading in the absence of isolation. The greater power therefore that a disease possesses of impregnating the air, and the greater distance the contagium can spread, the more far-reaching are the results. The contagia of some infectious diseases, especially of those peculiar to the digestive tract—Cholera, Enteric Fever—are not readily diffused into the surrounding air; but when they gain access to large volumes of water, food, &c., they give rise to sudden and extensive outbursts of disease. It is held that as the Cholera bacilli are killed by drying, they cannot be conveyed aërially, such a form of transport implying a dried condition, and that accidental contamination of food by other methods must be held accountable for the instances recorded of supposed aërial infection. This may apply in a greater or less degree to the other diseases mentioned, but yet it is an undoubted fact that young adult nurses, attending constantly on patients suffering from Typhoid rarely escape an ultimate attack of the disease. Not a few instances also have been recorded of the apparently aërial transmission of typhoid during excavations of the soil."

The chief—indeed, one might almost say the only means of preventing disease is CLEANLINESS; cleanliness of person, cleanliness of premises, cleanliness of domestic animals. Without cleanliness all other means can be of no avail. Disinfection is merely an aid to clean-

liness. If premises are kept thoroughly clean, disinfectants are not often required. Of course, all drains and closets (whether water or earth) are kept sweet and clean by the occasional use of disinfectants. Later on I shall have a few words to say on the subject of disinfection.

A Public Health Act is an urgent necessity in this colony, and it seems somewhat strange that the people themselves stand in the way of such a measure. I am not aware that any attempt to pass a comprehensive Public Health Act, having for its object the prevention of disease, has ever been seriously made by the Legislature of the Colony.

Under the provisions of the Municipalities Act (31 Victoria, No 12) of 1867, all Boroughs have power to make by-laws for suppressing nuisances, compelling residents to keep their premises free from offensive or unwholesome matters, regulating the interment of the dead and providing for the health of the Municipality, and against the spreading of contagious or infectious disease. Under these provisions would it not be practicable for the Borough Councils of Paddington, Woollahra, Waverley and Randwick to form a kind of Federal Union or Council, consisting of one or more delegates from each district, and agree among themselves to help one another to stamp out, or even to prevent the outbreak of those diseases which carry off so many young persons every year? The respective councils might notify one another of the existence of such diseases in their midst, as may be agreed upon. For instance, if Scarlet Fever should make its appearance in Waverley, the council of that borough should notify the other councils of its existence, and then precautions could be taken to prevent its introduction to Woollahra, Randwick and Paddington, and consequently its spread to Sydney and the Western Suburbs. This Federal Council might also establish a Hospital for Infectious Diseases, and so Isolation of patients might be secured and spread of infection prevented. It is argued by the opponents of the Hospital Isolation system that such a building must scatter the germs of Zymotic diseases throughout the length and breadth of the land. Now, if such a hospital were erected in our midst, so far from acting as a centre of contagion,

it would undoubtedly help by the segregation of infected patients, to stamp out the disease, for there would then be only one infected spot instead of many as at present. Such a Hospital should, of course, contain observation wards for the reception of "suspected" cases. This council, too, might demolish old or infected buildings, regulate domestic animals, more particularly dogs and cats—for diseased dogs and cats play no unimportant part in the dissemination of disease. I would strongly urge the appointment of a medical Officer of Health, such officer to be under the control of and to be paid by the aforesaid Federal Council; the duties of this officer to be the examination of suspected persons, premises, food and animals. In case of an outbreak of infectious fever in any house the patient might be removed to the hospital or otherwise isolated and the premises cleansed and disinfected, and I feel sure such timely action would put an end to the disease. Deadly diseases require prompt remedies, and such action on the part of the Medical Officer of Health would prevent the misery and anxiety attendant upon such terrible maladies, and save the rate-payers hundred of pounds every year. Our district is naturally a healthy one. Bounded by the sea on two sides, and by thick impenetrable scrub on a third, we should by united action, be able to prevent the occurrence of a single death from communicable disease.

There is another matter on which I should like to make a few remarks, and that is the Registration of Deaths. One of the reasons assigned for insisting upon the registration of deaths is to enable the authorities to ascertain whether any preventable disease is on the increase and to guard against such increase. To a certain extent the antiquated Registration Act helps us to do this, but the great drawback is that deaths need not be registered until nearly a month after the event has happened, and it is then too late to prevent the spread of the disease. Supposing, for instance, a death from Diphtheria occurs on January 1, the fact need not be notified to the Registrar until January 30, and in the meantime the whole district may have become infected. Thirty days is far too long an interval. It is as easy to register a death within seven days as within a

month, at any rate when the death occurs at not too great a distance from the Registrar's office. Then again, and this is a point to which I wish to draw the attention of the Mayors and Aldermen of our district, the boundaries of the registration districts are those of the Parliamentary Electorates and not of the boroughs. Until 1894 there was a registration district for every borough in the Eastern Suburbs. But with the new Electoral Act all this was changed and now it happens that deaths taking place in one suburb are credited to another. For instance, deaths occurring in the City or in Paddington or in Waverley, must, under certain circumstances, be registered in Randwick, and a similar topsy turvey state of affairs may be observed in the other suburbs. Now, in the case mentioned, in order to obtain information as to the causes of death in their respective districts, the municipalities of Sydney, Paddington and Waverley must obtain their statistics from various sources. Again, although the municipal district of Randwick may be entirely free from preventable disease, it may be forced to acknowledge a number of deaths from diseases, such as Typhoid, Diphtheria, &c., and yet have no means of defending itself.

In England by the provisions of the various Public Health Acts, the following diseases must be notified to the Sanitary authorities:—Small-pox, Cholera, Diphtheria, Membranous Croup, Erysipelas, Scarlatina, and Typhus, Typhoid, Relapsing, Continued and Puerperal Fevers.

Measles and Whooping-Cough are not notifiable diseases, but I hold that they should be included, as they are exceedingly infectious and cause a large number of deaths every year.

The advantages to be derived from compulsory notification may be summarized as follows:— (Sykes, "Public Health Problems.")

1. Timely and entire information of *all* cases of the diseases notifiable, their nature and location.
2. Power of preventing the spread of infection.

a. By enforcing proper isolation within the house and preventing exposure without, and by encouraging the treatment of non-isolated cases in hospitals provided for the purpose.

b. By enforcing the disinfection of persons and personal effects, and of dwellings and their contents.

c. By vaccinating those in contact with small-pox cases.

d. In cases of death, by taking proper precautions for the disposal of the body.

e. By preventing the attendance of infected children at school, and of infected adults at workshops, offices, &c.

f. By protecting clothing and fomites generally from being infected in domestic workplaces, laundries, &c.

3. Means of ascertaining the cause of outbreaks of disease.

a. By investigating the sanitary condition of localities, premises and houses.

b. By inquiring into the health of households and the associations of the occupiers.

c. By inquiring into sources of water, milk and food supplies.

d. By inquiring into the school, workshop, office, &c., attended or laundry used.

e. By ascertaining the effects of these upon a number of scattered individuals and bringing the facts to a focus, both in tabular form and upon spot maps.

4. Furnishing the data for statistical records of the prevalence and virulence of diseases, and of the variations to which they are subject.

a. The number of persons attacked by notifiable diseases in given areas.

b. The number attacked during given seasons and periods.

c. The age and sex of those attacked.

d. From these may be calculated the mortality ratios according to population, age, sex, and season.

e. In conjunction with the returns of deaths, the case-fatality of each disease according to age, sex and season may also be calculated.

f. It is thus possible to record the variations of the prevalence and fatality of disease as graphically as meteorological variations, by means of charts and curve-lines, either daily or for periods of any length of time.

Dr. Sykes says, "Notification being only a means to an end, however, it must form part of an organization for the control and prevention of infectious diseases, and its value will be in proportion to the efficiency of the Public Health Service in existence in a locality, which may be summed up as—a willing and educated sanitary authority, a trained medical officer of health, a skilled surveyor and engineer, competent sanitary inspectors, the prompt and efficient execution of prophylactic and sanitary measures, proper machinery for controlling infectious diseases, means for disinfection, hospital accommodation, &c."

To prevent the spread of infectious disease it is of the greatest importance that cleanliness of premises, person and clothing, &c., be insisted upon; all accumulations of dirt, filth and dust should be removed; overcrowding of rooms or houses should be prevented; drains, gutters, closets (whether earth or water) should be examined and if necessary rectified. All milk should be boiled, not merely scalded, when received into the house. All water should be boiled and filtered before use for drinking purposes.

The patient should be isolated. If an adult be suffering from Typhoid or a child from uncomplicated Diphtheria he should be removed to the Hospitals which receive such cases unless strict isolation and good nursing at home are possible. A room at the top of the house, where sunshine and fresh air are available, should be stripped of all curtains, carpets and draperies. A sheet wet with a solution of Sanitas or Carbolic Acid should be placed across the door, and none but those in immediate attendance upon the patient should enter the room. Nurses and those in attendance should not mingle with the rest of the household. They should wear dresses of material, such as cotton, which will not hold the germs easily, and can be washed or boiled, and they should frequently disinfect their hands with Carbolic or Corrosive Sublimate

solution. All vessels, spoons, &c., should be disinfected and well cleaned after being used. Pocket handkerchiefs should not be used by the patient, but in their stead pieces of soft rag which can be burnt at once. All discharges from the patient, particularly Typhoid stools, should be received into a vessel containing disinfectant. A good plan for disinfecting typhoid stools is the following:—Place at the bottom of the bed-pan some sawdust soaked in corrosive sublimate solution. On this receive the stools and then cover with another layer of the prepared sawdust. A quantity of sublimate solution is then poured over the whole; the pan is covered and allowed to stand for two hours before throwing the contents into a closet or other receptacle. All linen, bed or body, should be steeped in a solution of Carbolic Acid or Sanitas or other disinfectant before removal from the sick room. It should then be boiled in the house and not sent to a laundry. If the patient die the body should be wrapped in a sheet impregnated with strong disinfectant and enclosed in a leaden coffin, and buried, if possible on the same day. No persons other than those immediately concerned should attend the funeral. If the patient recover, a room close by should be prepared by disinfection for his transference. The patient should bathe frequently in warm water, to which some disinfectant, such as Carbolic Acid or Sanitas, has been added, before leaving the room. In the acute exanthematous diseases it is well to anoint the body of the patient with Carbolised oil or vaseline in order to prevent the detachment of the infective agents from the surface of the body and their transport in the air.

I need scarcely say that I am strongly of opinion that disinfection should be carried out at the public expense if necessary.

In Göttingen the following regulations have been drawn up by the Medical Officer of Health.

Families in which a case of infective disease has occurred and who desire disinfection, must send an intimation to the court-house, stating also the nature of the disease. In this way the staff can judge to the extent of the disinfection and the method to be employed: the following are their instructions

according to the nature of the case:—Small-pox, Scarlet Fever, Typhus, Diphtheria, &c., linen, beds, curtains, &c., are to be disinfected with a current of steam; bedsteads and floors to be scrubbed with sublimate solution; upholstery, &c., to be moistened with sponges dipped in sublimate solution, and at once dried. Cholera, Typhoid, Dysentery: disinfection of linen, &c., by steam. Water closets disinfected with 5 per cent, Carbolic Acid; cesspools, &c., with commercial Hydrochloric Acid. In Typhoid Fever and Dysentery, cleanse the bedsteads, floors, &c., with sublimate solution.

The persons who are to carry out the disinfection take with them all the solutions, vessels, brushes, &c., also some India-rubber garments, and a number of moistened cloths of various sizes; also the wire basket from the sterilizing apparatus. These are transported in a suitable hand barrow. When they reach the house they put on the india-rubber garments, and take the utensils and cloths into the room, wrap the beds, mattresses, clothes, &c., in the moist cloths, cleanse their hands and mackintoshes with sublimate solution, and place the parcels in the wire cage. One of the disinfectors takes these back to the apparatus, which has been in the meantime heated by the third, while the first remains behind and disinfected the room. After two or three hours the beds, &c., are brought back, and in the meantime the room has been disinfected.

Persons suffering from infectious disease should not be allowed to mingle with healthy persons until all danger of infection is passed. The Association of Medical Officers of large Public Schools in England have advised the following period of isolation and quarantine in respect of the several diseases tabulated.

(See Table on following page.)

DISEASE.	Quarantine to be required after last exposure to infection.	Earliest date of return to school after attack.
Small-pox	18 days	When all scabs have fallen off
Chicken-pox	18 „	„ „ „ „ „ „
Scarlet Fever	14 „	Six weeks, and then only if no desquamation or sore throat.
Diphtheria	12 „	Three weeks, if convalescence is complete and no sore throat, albuminuria or discharges remain.
Measles	16 „	Three weeks if all desquamation and cough have ceased.
Whooping Cough	21 „	Six weeks from the commencement of the whooping, if characteristic spasmodic cough and whooping have ceased. Earlier if all cough gone.
Rötheln	16 „	Two or three weeks, according to the nature of the case.
Mumps	24 „	Four weeks, if all swelling have subsided.

It should be made an offence punishable by heavy fine for persons to expose themselves or others, while suffering from communicable diseases, in any public place. I have little doubt that Whooping-Cough is spread directly in this manner.

Other provisions I would insist upon in the event of a Public Health Act being brought forward are, Prevention of "wakes," or other exposure of the body of any person dying of a communicable disease; and early burial; and I would forbid the use of mourning coaches as hearses in the funerals of children.

I do not think it advisable to dwell on other matters which are important factors in the prevention of epidemic diseases. But, having drawn your attention to some of the principal means by which disease is spread and having placed before you my views on the methods

of prevention, I shall feel rewarded for my trouble if the discussion which ensues leads to the adoption of a practical scheme for the extermination of those diseases which may be prevented by timely and united action in the proper direction.

We Medical men can do little of ourselves; but we must seek to enlighten the public mind and point out to the masses the dangers that threaten the community at large from dirty and insanitary premises. We must, in the spirit of the second rule of our Association, urge upon the Borough Councils and Sanitary Authorities the necessity, where such exists, for constructing sanitary works, &c., and thus we may be able to prevent the outbreak or spread of epidemic disease in the Eastern Suburbs of Sydney.

