

THE ADMISSION OF INFECTIOUS CASES INTO GENERAL HOSPITALS.*

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THE principle involved in this title is one of considerable importance, and one on which medical officers of health should be prepared to offer an undivided opinion. It is on this account that I have deemed the matter worthy of some consideration from this Society. It seems probable that a discussion of the question may lead to the formation of decided and accurate views, and I am led to ask you to discuss it rather in order to assist in bringing this about than because I have any determined or novel ideas to set before you.

I think that I shall be able to show that in this country very various methods are adopted, and very different views appear to be held concerning the dangers attending the admission of infectious cases into general hospitals. It is certainly probable that the needs of populations of different sizes have to be met in different ways. The isolation of infectious diseases, say, in London is an entirely different problem to their isolation in a provincial town or in a rural district. Yet one might expect to find in towns of somewhat similar size that a greater unanimity of methods would be met with than actually occurs.

As a rule, we find that each provincial town contains some form of general or cottage hospital, and also some separate provision for the isolation of infectious cases; this latter may either consist of a complete infectious hospital, or of a share, or right of use, of some such hospital.

The origin of the general hospital is very much more ancient than that of the infectious. In the days of Babylon's prosperity the sick were placed in public squares for the public to gaze at, on the chance that some might pass by who had suffered from the same ailments and had discovered a cure for them.

In this country general hospitals originated in monastic arrangements for the care of the sick and indigent. As early as 1080 Lanfranc founded the first English hospitals, one for leprosy and one for other complaints. Such medical relief for poor people was in the hands of the churches until the Reformation, when certain monasteries were converted into hospitals, *e.g.*, St. Bartholomew's,

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which had been a priory, St. Thomas's, Bethlehem, and Christ's Hospitals. That was the historic germ of modern hospitals. The great era of hospital-building occurred in the first half of the eighteenth century, when Westminster, Guy's, St. George's, London, and Middlesex found their origin. Since then a number of hospitals have found their birth in the enterprise of some medical men who in the first instance offered to meet the wants of the poor by providing advice gratis during certain hours. Private consulting-rooms being too limited for the numerous patients who had heard of the renown of the famous doctor who gave advice for nothing, special premises had to be taken, and in this these medical benefactors of humanity were assisted by well-meaning philanthropists, and the seed of a hospital was sown. This method of gaining fame would now verge on the "infamous and unprofessional." Such, then, was the varied origin of general hospitals.

Hospitals for infectious diseases in England date only from a century ago, when they began to supersede the old parish "pest-house," which had up to that time formed the only special provision for the treatment of the infectious sick.

A report of the late Sir George Buchanan to the Local Government Board in 1882 states that :

"The original design of these hospitals was to promote the recovery of the individual poor patient for whom other accommodation was wanting; indeed, the name 'house of recovery' was a frequent synonym for infectious disease hospital at the period when such an institution was first seen to be necessary. But it was inevitable that the advantages to be obtained by the district possessing a hospital would soon force themselves on the attention of the observer, and from a very early period of their history infectious hospitals have been advocated on the ground of their protecting the household against the spread of infection.

"The benefits of these hospitals were not, however, obtained without a good deal of misfortune within the walls of the institutions themselves. In the small-pox hospital, indeed, this was not so apparent. Small-pox had from the beginning been regarded as requiring a special building to itself; it had a 'specific' contagion, which could not safely be treated under the same roof with the 'general' contagion of fever. So, in the hospital where no disease but small-pox was received, patients had no opportunity of contracting other diseases; the nurses, in early times selected from among those who had passed through an attack of small-pox, and in later times having their vaccination specially cared for, took nothing from their patients. But in the 'fever' hospital the case was different. Doctors and nurses caught fever—in some years more than in others; while convalescent patients had what appeared to be repetitions of 'fever' attacks. So serious, indeed, did these misfortunes become that forty years ago it had come to be spoken of as doubtful whether fever cases, if they were to be treated in hospitals at

all, had not better be distributed through the wards of general hospitals. The experiment was tried, but with far greater disaster to the patients and attendants of the general hospital."

Since that time great strides have been made in the matter of hospital construction and administration; further, great advances have been made in the differentiation of the various kinds of fevers; and greater importance is attached both in general and in fever hospitals to obtaining capable trained nurses to take charge of patients. Just as it was formerly known that small-pox required to be dealt with in a separate building, so it is now recognised that scarlet fever must be rigorously isolated, and that cases of typhus fever must be treated separately and independently from other diseases.

It is not now the custom to question the advantage to a community of being possessed of ample isolation accommodation. This is, indeed, taken as an axiom; but now that our knowledge of the degrees of infectivity of different infectious diseases and of the dangers to the community arising from their non-isolation is becoming more exact, the practical problem arises as to the extent to which we should advise our authorities to go on increasing their isolation accommodation. For it is clear that if each district or combined district is to provide separate isolation for, say, small-pox, scarlet fever, typhoid fever, and diphtheria, with the possible advent of a stray case of typhus fever, and if it is necessary to deal with each separate disease in a separate block, and the nurses attending on different diseases are to be similarly isolated from one another—in other words, are to be provided with separate administrative buildings—then this question of adequate hospital accommodation is assuming proportions which, in the smaller towns and districts, will be of very serious import.

What, then, are the diseases for which we can properly advise our authorities to build isolation accommodation? and what are the diseases which it is either unnecessary to isolate, or which can be efficiently dealt with at home or in a general hospital? Among those that should be dealt with at home are universally placed measles, whooping-cough, and chicken-pox. Chicken-pox because of its triviality as a disease; measles and whooping-cough because the building of hospitals for their isolation is rendered impracticable on account of the expense which would be involved by the huge epidemics for which we should at times be called on to provide.

It appears to be indubitable that small-pox is a disease which it is to the interest of the community to isolate rigorously. Very beneficial results have followed this course of action, and very

disastrous ones have resulted where from any cause it has been neglected.

Typhus fever, again, is a disease which it is probably only necessary to mention, its rarity in England—out of London or Liverpool—rendering it not necessary to make special provision for it; though on its occurrence it should certainly be isolated.

Scarlet fever it is the general practice to attempt to isolate in special hospitals. I say “attempt,” for the isolation has indeed been very half-hearted. Our powers of compelling isolation are limited. In London, from 1890 to 1897, the percentage of cases isolated varied from 42 to 66. In Liverpool last year 60 per cent. were isolated, while some few towns exceed this number; *e.g.*, Birmingham in 1898 isolated 82 per cent. of its cases. Probably the London figures will more accurately represent the average number isolated in most provincial towns; *i.e.*, a little over, or perhaps only, one-half, of the cases are isolated. It may be reasonably open to doubt whether such partial isolation is worth the money that is spent on it, or whether any really practical benefit is derived from it. Isolation has now been attempted by the Metropolitan Asylums Board in London for scarlet fever since 1871, and yet the disease shows no sign of diminished prevalence. The only favourable sign is that the case mortality of those isolated has diminished from 10, 12, and 14 per cent. in the seventies to 4·07 per cent. in 1897. This is probably mostly owing to the fact that a larger number of trivial cases are now isolated than formerly, while it is probably also partly due to the lessened severity of the disease in general. It is possible that this lessened severity which has undoubtedly occurred during later years may bear some occult relationship to the fact that for nearly one generation the disease has been treated more or less in hospitals; but this is, of course, pure speculation. We may take it then, I think, that since it is a usual practice to attempt to isolate scarlet fever, it is probably a good practice; but at the same time I would submit that it may reasonably be held that the present partial isolation is a very meagre attempt to deal with the complaint. Apart altogether from vaccination, were our efforts at the isolation of small-pox as slight as they have been in regard to scarlet fever, there can be little doubt that small-pox would now be more common than it is.

We shall probably, then, find ourselves agreed on the necessity for the isolation of small-pox and scarlet fever. The erection of the necessary accommodation for these diseases will include isolation for cases of measles or whooping-cough inadvertently introduced into the hospital; and at the present time will necessitate a

separate building for small-pox, with separate administrative block and staff apart from that for the scarlet fever hospital. This, if properly done, will involve no mean expense for any given limited community.

It remains then for us to determine whether provision should further be made by the rates for the accommodation of other infectious diseases, or whether they can reasonably be dealt with in any other way. The remaining infectious diseases are mainly enteric fever, diphtheria, membranous croup, tuberculosis, and erysipelas. The last two are of such a limited degree of infectivity, and precautions against their spread can so readily be carried out at home or in a general hospital, that it cannot at the present time be reasonably suggested that it is to the interest of a community to attempt their isolation.

Enteric fever and diphtheria (including in the latter term membranous croup), however, are diseases concerning which we may note very great variations in the practice adopted. London has attempted to isolate enteric fever since 1872. The mortality from this disease per 1,000 of the population has steadily declined from 0·27 in 1872 to 0·12 in 1897. Since we have no figures of the number of cases previous to 1890, we may take it that this is probably owing to a lessened prevalence of the disease. Since 1890 the annual number notified has varied but little, being generally a trifle above or a trifle below 3,000. The case mortality since 1890 has practically remained stationary. Only 30 per cent. of the cases notified in 1897 in London were isolated in rate-supported fever hospitals.

The practice of other towns and districts varies very considerably. Liverpool, for instance, in 1898 isolated 67 per cent. of the cases notified, while Birmingham isolates none. Very probably the practice is dependent on whether enteric fever has ever appeared locally in an epidemic form, or whether only sporadic cases are met with. Now that our knowledge of the possible methods of spread of enteric fever from one person to another is becoming very precise, it is possible for us to lay down very definite rules as to the conditions which constitute proper isolation for this disease. We know that the alvine evacuations are mainly responsible for its spread. We know that with proper carefulness and trained nursing it is as difficult for the infection to travel in a general ward of a hospital from one bed to the next as it is for the pillows to so travel. The nurses and actual attendants on the patient are, of course, exposed to more risk, but with a due attention to cleanliness, and very strict washing of the hands, this risk is reduced to a vanishing-

point. The nursing of an enteric fever patient under proper conditions is attended with no more danger in a private house or a ward of a general hospital than in an infectious hospital ; and I have yet to meet the doctor or the nurse who wished to shirk this infinitesimal risk by urging the sanitary authority to make itself responsible.

It is when the proper attention cannot be obtained, as in poor houses, where the proper nursing cannot be afforded, or is not understood, that the home nursing of enteric fever becomes surrounded with dangers. It is here where external assistance is required, and the question arises as to whether this external assistance is best given by the rate-supported infectious hospital or by the general hospital. In any district where the disease exists largely or permanently, there would be considerable advantage in the infectious hospital providing the accommodation, since the nursing staff in such an institution would by tuition and prolonged experience be especially qualified to deal with the cases. On the other hand, it has to be remembered that the infectious hospital is a scarlet fever hospital, and the introduction of an additional disease will involve more than the mere increase of the staff. It should involve an entirely separate staff, accommodated in an entirely separate administration building, otherwise the younger enteric fever patients will be exposed to a risk which is quite unwarranted.

In a small town or district where the disease is only met with to a limited extent, it remains to be seen whether the general hospital cannot fully meet the requirements of those poorer patients who cannot afford proper attention. They are surely sufficiently deserving of charitable assistance to obtain such from these institutions, and they have the advantage of being sufficiently interesting clinically to give them a claim which will place them in a category apart from those deserving but often refused cases which lack this advantage.

The question then arises, to what extent is it advisable to recommend that the provision for the poorer class of patients should be made by the local authority, and to what extent should this be regarded as the duty of the general hospital? On the one hand, we have to remember that the power to provide hospitals or places for the reception of the sick by local authorities rests upon the power vested in them by Section 131 of the Public Health Act, 1875, this power being of a purely permissive character. A local authority may make no such provision, and there is no power vested in the Local Government Board or any other board to compel them to do so, or they may make provision for the reception of any kind of sickness. In fact, any local authority may build, or buy, and

maintain a general hospital and treat any kind of disease or accident. This power is now fully determined, and a commencement towards a most desirable end, the municipalization of hospitals, has been made by the town of Barry in South Wales, where a cottage hospital is maintained by the local authority.

On the other hand, we have to bear in mind that most general hospitals are purely private institutions, and may be closed at any moment by the wish of the governors or subscribers. But, however this may be theoretically, they are not actually regarded as, nor are they, purely private institutions. They pose as public institutions, and they appeal to the public for subscriptions from this point of view. They are dependent on the public for support, and it is on account of their advantage to the community that they continue to live. They owe, therefore, a duty to the community which is not discharged by the mere attention to accidents that are brought to their door, or by the treatment of those more fortunately situated patients who happen in some accidental way to earn the goodwill of the holder of in- or out-patient tickets.

In order to determine to what extent general hospitals undertake this function, and to find out how far my opinions coincided with the practice of general hospitals, I have written to all the large general hospitals in the country, confining my inquiries to all those which had 100 or more beds, 71 in all. I have received replies from 68. In 56 cases enteric fever patients are admitted; in 7 hospitals they are only admitted for observation or under a mistaken diagnosis; and 5 hospitals do not admit them at all. We have therefore a consensus of opinion which is greatly in favour of the admissibility of the disease into general hospitals. In order to determine whether any instances of the spread of infection to other patients had been noted, I asked a question to this effect. Of the 56 hospitals admitting enteric fever, 47 gave a negative reply to this query, 4 replied blankly in the affirmative, 2 others stated that in each case one patient had contracted the disease while in a ward containing an enteric patient, but it was doubtful how the disease had been contracted; one answered "very rarely," another "very, very rarely," and a third that it was "a very rare occurrence."

In 8 cases the information was volunteered that a nurse or nurses had suffered from enteric fever while nursing the disease; 1, that 2 nurses and 1 resident medical officer had contracted the disease under similar circumstances; 1, that a wardsmaid had had an attack; while in the last instance where nurses had suffered the cause was fully investigated, and the sanitary arrangements of the hospital were found to be wholly defective.

Of the 7 hospitals where the disease was only admitted for observation or under a mistaken diagnosis, no cases of infection of other patients had been noted, while in one case a nurse had probably been infected in this way.

Of the 5 hospitals altogether refusing the admission of this disease, only 1 gave any reason, that reason being that five years ago 2 nurses suffered while attending on an enteric patient.

The *British Medical Journal* of April 29th last stated that "there is, as far as we know, no such institution (as a general hospital) in London which does not admit cases of enteric into the general wards."

The outbreak of enteric fever among the staff of University College Hospital in 1897 is fresh in our memories. In that outbreak 12 nurses and 6 wardmaids suffered, and it was shown to have owed its origin to a temporary water-supply during building operations coming from a cistern which supplied a slop-sink and a vat where infected linen was soaked.

What comments need be made on the information here detailed? If comment be necessary, it may be observed that enteric fever will occur as readily in hospitals as elsewhere when sanitary arrangements are defective; that the staff attending such patients must necessarily be exposed to some risk, and that this is no greater in a general hospital than in a fever hospital; and, finally, that in those rare instances where infection does occur from one patient to another, it is a grave reflection on the nursing of the hospital, for such an occurrence ought never to take place.

In regard to diphtheria, we find that a very much larger difference of practice appears to prevail. The Metropolitan Asylums Board has attempted to isolate diphtheria since 1888. The number of cases notified has increased from 5,870 in 1890 to 12,803 in 1897; the percentage isolated has increased from 17 in 1890 to 51 in 1897; and the fatality per cent. of those isolated has gradually lessened from 59 in 1888 to 30 in 1893 and to 17 in 1897, whereas the mortality per thousand of the population has been increasing rapidly, and although it has lessened from 0.76 in 1893 to 0.51 in 1897, each of these figures is far greater than it has ever been in any recently recorded year. The isolation of this disease in London therefore has not had an appreciable effect in diminishing the prevalence of the disease.

In provincial towns the practice varies largely; I have returns from 20 towns, comprising towns with populations varying from 50,000 to 100,000, and in addition including Manchester, Birmingham, Bradford, and Leicester. I find that in 10 of these towns an

effort is made to isolate diphtheria in the infectious hospital, while in 10 others no attempt is made. I believe that in some few general hospitals ordinary diphtheria is admitted, though this is not so in most hospitals. I have myself seen diphtheria treated in the general wards of a general hospital with no untoward result; but most of us would probably prefer that such cases should be treated in a side-ward. This side-ward need not be an isolated building, and most general hospitals contain such small wards for special cases.

With diphtheria we have to associate membranous croup, for the reason that most cases of the latter disease may be shown to be pathologically and bacteriologically similar to diphtheria. The provision of hospital accommodation for this disease is peculiar in that the hospital accommodation is rather required for the actual benefit of the individual patient than for the benefit of the community.

The liability to the occlusion of the larynx by membrane rendering tracheotomy necessary causes this illness to be such that most private houses are unable to furnish the resources necessary for facilitating the performance of the operation, and the proper subsequent treatment of the patient. Hospital accommodation of some sort for this type of disease is therefore highly desirable, if not urgently necessary. Yet we see that a considerable number of large towns do not make this provision in their infectious hospitals. My returns from 68 large general hospitals were intended to throw some light on the usual practice of general hospitals in this respect.

I find that 16 of these hospitals admit membranous croup unreservedly; 46 others admit such cases if urgent or when they require or are likely to require tracheotomy, while the remaining 6 hospitals would deal exceptionally with urgent cases, as follows:

No. 1 would in an urgent case do tracheotomy, and then send the patient a quarter of a mile away to the fever hospital.

No. 2: The senior house surgeon of this hospital has only had one urgent case in four years. Tracheotomy was performed, but the child died before being transferred to a ward. So that probably such a case would have been admitted.

No. 3 has a fever hospital in the same grounds, and such a case would be at once transferred.

No. 4 has a rule passed by the board of management which would necessitate an urgent case being sent away unrelieved.

No. 5 would send an urgent case away.

No. 6: The house surgeon informs me that the board has forbidden the admission of membranous croup, and "urgent cases are sent home to die. This actually occurred a year ago."

We learn, then, from these statistics that although 16 hospitals admit membranous croup unreservedly, 46 others only admit urgent cases or cases where surgical interference may be necessary; *i.e.*, 62 out of 68 of the largest general hospitals in the country do admit such cases.

I further asked the question as to whether the admission of such cases had led to the spread of the disease to other patients. Since in each case the query was addressed to the senior resident officer, the replies will probably be applicable to the last few years of the history of each hospital.

Of the 16 hospitals admitting membranous croup unreservedly, 14 gave negative replies, 1 answered affirmatively, and 1 said "possibly."

Of the 46 hospitals admitting urgent cases only, 42 gave negative replies, 1 answered "yes," 1 said that "diphtheria has spread," 1 referred to an outbreak of diphtheria in a ward, but did not show that this arose from any previous case of the disease, and the last said that 2 boys had once developed diphtheria, but there was no diphtheria case in the block to which these attacks might be attributed.

Of the 6 hospitals that would not admit membranous croup, none had any history of the spread of the disease to account for their non-admission.

I regard these replies as proving conclusively that the possibility of the spread of membranous croup to other patients in a general hospital is frequently exaggerated. The cases in which affirmative or doubtful replies are given are so few that these might easily have been accounted for quite apart from the admission of the disease, for such outbreaks occur from time to time in asylums and other public institutions when they obviously do not depend on the admission of patients suffering from the complaint. Should such a method of infection ever occur, it is very likely that it depends on that very common and very baneful habit of general hospitals being built with an allowance of 1,200 or 1,500 cubic feet of air space per patient, and extra beds being subsequently erected in a manner perfectly regardless of the proper hygiene of the wards.

My conclusion, then, in regard to membranous croup and enteric fever is that in any town or district where only a limited number of cases are met with, they may more advantageously and with greater safety be treated in a general hospital than in a scarlet fever hospital. Should this duty to the community not be undertaken by the general hospital, and if each sanitary authority builds separate blocks for these diseases, then the very much more far-

reaching question will arise whether any given town is expending its money wisely in maintaining two separate fully equipped hospital administrations for two small hospitals, one a general and the other an infectious hospital, when they could so much more economically be jointly managed if under the same government, for the money to support both, though ostensibly coming from different sources, merely comes from different pockets of the same people.

I might enlarge on this aspect of the question by commenting on the amazingly archaic and conservative organization of general hospitals, and I might compare the economy of rate-supported hospitals with the irresponsible extravagance of general hospitals. I might point out how the large poor-law infirmaries of London are now doing as efficiently the work of general hospitals at less than half the cost per bed incurred by the general hospitals. But these matters, although of high municipal interest, go beyond the original purpose of this paper.

BORIC ACID POISONING.

It has been pointed out by Dr. Alfred Hill, and others, that one great source of danger in the use of boric acid is the fact that it is impossible to control the quantity of the preservative added by one person alone, while there is no guarantee that successive persons may not each make an addition of it to one and the same article of food. A striking case illustrating this repeated addition of a boric preservative is reported by Dr. M. K. Robinson, Medical Officer of Health of East Kent Combined Sanitary District. Dr. Robinson had to investigate a sudden serious outbreak of illness. Five out of the seven inmates of the house were attacked within a short period of each other. Suspicion attached to the milk, which had been taken alone, in tea, and in the form of blanc-mange. Both to the morning and afternoon supply the cook had added a preservative, which was found to contain boric acid. A sample as delivered by the dairyman was analyzed, and found to contain a similar substance. Thus, for the same purpose, a preservative had been added twice, the result being that an overdose had been administered. To nine fowls was given the residual portion of the blanc-mange. Five of them, which consumed the larger quantity, all died, while the remaining four suffered badly, but recovered. Dr. Robinson urges that the addition of the drug should be regarded as an injurious adulteration. If such results, he says, can be produced in the case of adults, it is not unreasonable to presume that infants cannot take with impunity long-continued doses in their staple food. The opinion is general among physiologists that all preservatives, when effectual, either from their nature or quantity, in so injuring the micro-organisms which bring about fermentation or putrefaction in food as to inhibit their action, also injure those persons who consume such food.
