the bodily secretions or with food, is the cause of chest trouble in one case and of abdominal in another.

Koch has told us that while secondary infection of the intestine is admittedly very common, primary infection of that tube with tuberculosis is exceedingly rare. This conclusion, however, is not in accordance with British experience as regards disease in children.

In 66 cases of Dr. Shennan's, 45 were found with ulceration of the intestine prior to infection of the glands of the mesentery; but in a minority the glands were affected with little or no lesion of the bowel, thus tending to support the view that bacilli may sometimes find their way through a mucous surface without leaving traces there of primary inoculation. It is said¹³ that in Germany the use of boiled milk is very common, if not the rule, while with us it is the exception; and this difference of treatment would, therefore, if milk be the cause of the disease, explain the greater frequency of primary intestinal ulceration among us.

The following case has been often quoted in support of the belief that tuberculosis can be acquired from milk. At a school for girls in France there occurred within three months 11 cases of tuberculosis of which 5 were fatal. In several of the cases the site of the infection appeared to be intestinal. The milk used during the period was obtained from a cow affected with tubercle of the udder and internal organs. There is other evidence of at any rate the occasional innocuousness of tuberculous milk. The following occurrence was communicated to me by Professor Clifford Allbutt, with his permission to publish the facts: Some years ago when living at Meanwood, near Leeds, he used to keep a small herd of Guernseys, among which was a prize cow he had purchased for a high price. This cow had been coughing for many weeks without any particular attention being paid to the fact, when at last it was noticed that her milk did not look right. On examination disease of the udder was found, no doubt at an advanced stage, seeing that the milk was noticeably altered in appearance. The milk contained swarms of tubercle bacilli, and had been consumed mixed with that of the other cows for a long period by over twenty persons, ten of these being children. This disclosure naturally gave Dr. Allbutt considerable anxiety for a time. But he says, "No one was one penny the worse, except myself for the loss of my pedigree cow."

From instances like the foregoing it is difficult to draw any general conclusion as to the danger of drinking tuberculous milk. The evidence, however, tends to show that such milk is not highly infective when diluted with the milk of healthy cows, and that some persons are likely to show a much higher degree of susceptibility than others. Nocard, an eminent French authority, quotes several cases of tuberculosis of the intestines in young persons traced with a high degree of probability to milk, but he also says, "Ingestion only succeeds in giving tuberculosis when the ingested material is very rich in bacilli."¹⁴

As regards the spread of tuberculosis we seem to be going through much the same change of thought as we have gone through with regard to the spread of typhoid fever. In this disease we used to say that case-to-case infection was very rare, and that infection from a common source was the rule. We now believe that the disease often arises from case-to-case infection. In the same way we have slowly come round to the idea that tuberculosis in adults arises directly or indirectly from case-to-case infection. During the last few years the belief has become general that the tuberculosis of childhood is due mainly or entirely to a common source of infection, namely, milk. Are we not now in process of recognising that here again tuberculosis is mainly caused by infection derived directly or indirectly from a person affected by the disease?

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GENERAL HOSPITALS AND PULMONARY CONSUMPTION.

By ALEXANDER ROBERTSON, M.D., F.F.P.S.G.,
Late Physician, Royal Infirmary, Glasgow.

ONE of the most important problems that have arisen in connexion with the national efforts to check the ravages of phthisis pulmonalis is how to deal with advanced cases among the artisan and generally less wealthy classes—those socially a little above the pauper grade. The sense of self-respect of the sufferers will not, as a rule, permit them to enter the parochial hospitals; and, indeed, at least in Scotland, they would have no legal claim to become inmates of these institutions. What happens with a large proportion of the cases of that kind in Glasgow, and presumably also over the kingdom, is that they seek admission into our infirmaries and general hospitals, and—I do not put it too strongly—are turned away from their doors. It is done in this way: A consumptive, with cavities in the lungs, having obtained a subscriber's line and a medical certificate of his illness, comes or is brought by his friends to the reception room of the infirmary. He is there examined by one of the resident medical officers, and also, in the event of a refusal, by a dispensary or chief physician. The decision having been arrived at that the disease has advanced to the condition described, the patient is told that his case is unsuitable for admission. Very clearly, the shock to the sufferer and his friends must often be great on hearing this statement, and, it need scarcely be said, the duty of declining him is a painful one to the physicians.

OBJECTIONS TO ADMISSION OF ADVANCED CASES TO GENERAL HOSPITALS.

In such cases, whatever their feelings, there is nothing for it but to go back to their homes. These are too often in densely populated districts where overcrowding is common. There they remain for the weeks or months that intervene before death closes the scene. More frequently than otherwise husbands or wives, brothers and sisters, as the case may be, are meanwhile exposed to the infection from the sputa that are usually so abundantly expectorated in the terminal period of consumption. During all this time they are centres for the diffusion of tubercle both in the home circle and around it. Who can doubt that this is one—indeed, probably, the chief—source from which continues to spring the various forms of tuberculosis, and more particularly phthisis pulmonalis?

The question arises, Ought the physicians who refuse to receive consumptives in the advanced stage into their respective hospitals to act otherwise? Certainly not, in view of the absence of special arrangements for the care of these cases. The physician's duty is, as far as practicable, to protect those under his charge from possible infection, and to admit in considerable numbers patients in advanced consumption into the general wards would be blameworthy. It would endanger those recovering from pneumonia, certain forms of bronchitis, and, generally, cases in which the vital powers are low, especially when there is likewise an hereditary disposition to tuberculous disease. It will doubtless occur to many, why restrict the objection only to the admission of considerable numbers, as, if there be risk, why not exclude all cases of that kind from the ordinary wards of hospitals? Complete exclusion of them I believe to be the only sound and satisfactory position to take up in relation to the question. And yet there are physicians of eminence who contend that in the large, well-ventilated wards of modern hospitals, with abundance of air space and disinfection of the sputa, the presence of, say, two consumptives with vomices in their lungs and abundant expectoration in a general ward does not really expose the other patients to danger of infection. They point to the absence of evidence that either patients or nurses in such hospitals have actually become phthisical. To this the reply may justly be made that the danger, though not great, unquestionably exists. Patients in the stage referred to, when they become weak and when the mind is not very clear, sometimes carelessly or inadvertently, especially at night, soil their nightdresses and bedclothes with the sputa. This, it must be obvious, is a clear source of risk to others.

The mere fact that no patients are known to have acquired phthisis does not warrant the conclusion that it has not actually occurred. The bacilli may have been inhaled by them during their residence, but have become practically encapsulated in the lungs, and so have remained inactive at first. Later, perhaps after months or longer, at a time when the resistive powers of the system had somehow become impaired, they may have wakened up into action and begun their work of destruction. Of course this cannot be proved; but neither can it be disproved, and the possibility of infection being so caused is undoubtedly present. However, as a matter of fact, I know of three nurses, a house physician, and a patient, who, there is strong reason to suspect, acquired phthisis in the wards of a large hospital. Further, there seems a certain want of consistency in permitting even two cases to be in the wards; the very fact of limitation implies an admission that there is risk in the presence of the disease. The knowledge that patients in the advanced stage daily expectorate thousands of bacilli justifies that apprehension.

SPECIAL WARDS.

We have also to consider the question of medical education in connexion with the presence of phthisis in hospital wards. Wherever medical students are under training there must be facilities for their acquiring a thorough acquaintance with its symptoms and physical signs in all its stages. It is therefore necessary that advanced cases should be in or near wards where clinical instruction in general medicine is given. We have consequently to meet the two requirements—the protection of other patients, and the education of the young men and women who are preparing to enter the profession. This can obviously be done without serious difficulty; phthisical cases have simply to be removed from the ordinary wards and kept by themselves. The amount and kinds of separate accommodation required will be best determined in connexion with another aspect of the subject.

Bearing in mind the conditions which have been briefly discussed—the necessity of retaining some cases in general hospitals in the interests of clinical teaching, the protection of other patients, and more especially the prevention of infection by those refused admission to relatives and others in their homes—the special wards suggested would probably need to be of considerable size; perhaps in some cases more than two would be required. In the three large infirmaries of Glasgow the total number of advanced cases of phthisis usually amounts to about thirty. If in each of them there were two special wards, a male and a female, with forty beds in all, there would be accommodation for 120 patients. It may be doubted if this would suffice for all the cases in the city, belonging to the classes and in the stage referred to, who would be willing to leave their homes. The question can only be determined by fuller inquiry. My impression is that the provision named would be ample for the number of cases requiring care at one time. It is not to be lost sight of that the problem only concerns a portion of the community; the higher and lower sections are provided for otherwise.

Where there is sufficient ground attached to a hospital it is desirable that the phthisis wards should be at some little distance from the main buildings. It would also be an advantage if they were built, say, of brick, so that they might be taken down and renewed every few years. They ought to be constructed on the open air principle both on the patients' and students' accounts. Even in the advanced stages of the disease the sufferers often derive much benefit from it; indeed recoveries now and again, though exceptionally, occur. The gain to the students would also be important, for they would become familiar with the details of this mode of treatment, and be prepared to use it in suitable cases in everyday practice, even in cities. In this way the benefit to the general public would be great. In the case of hospitals where ground is not available for new erections, an effort should be made to set apart special wards for these cases, as much isolated as is practicable.

Other proposals have been made for the care of cases of advanced consumption. One is to build municipal hospitals for them. It is certain that very many of the patients would not consent to go there. As is well known the hope of recovery is retained to near the fatal close in a large proportion of phthisical cases, and the gloomy associations of an insti-

tution solely devoted to conditions mostly hopeless would have a deterring effect in many instances. There is perhaps less objection to their being associated with the curables in the sanatoria likely to be erected over the country. Still, the frequent deaths among the advanced cases, which could not easily be concealed from those in a more hopeful stage, would have a depressing and injurious effect on the latter. Another weighty objection would be their removal from the neighbourhood of relatives and friends. The sanatoria will be at some distance from large towns or cities. A visit to them will occupy a large part of a day, and the expense of frequent visits will be a serious consideration to those whose means are small. Naturally the desire, both of the afflicted and those dearest to them, to see each other often increases as the end draws near. No more suitable place away from their own homes could be found than the hospital of the town or district of the city in which their homes are situated. Daily or more frequent interviews are there usual in all diseases when death becomes imminent. An additional advantage would be the far fewer removals to their own dwellings arising from the longing to be with their relations when the illness assumes a more serious aspect. Indeed, for the all-important reason already urged—the danger to others—a return home should be opposed firmly but with all possible consideration. If this were done and the reason fully explained, probably few would persist in their intention to leave hospitals near where they reside; were they to do so, there is no law to prevent them.

TREATMENT OF ADVANCED CASES.

So far we have been all but assuming that this class of patients would enter these wards simply to die. This, no doubt, has been our experience of advanced phthisis in the past. Happily the prospect is now less gloomy. Reference to Dr. Philip's paper lately published,¹ as well as to the statistics of Quarrier's Home in Renfrewshire² and those of the German sanatoria, shows that to an encouraging extent, even when the disease had progressed to the stage of softening and formation of cavities, under the open-air system of treatment the patients so far recovered as to be considered fit to go back with safety to the families of which they were members.

However, while welcoming this newer method to our armoury for the treatment of phthisis in its later as well as in its earlier stages, we must not discard medicinal measures; that would be a great mistake. Dr. Koch³ has been lately showing a good case in favour of our old friend tuberculin in its improved form. His favourable conclusions on the present occasion seem based on a sufficient number of cases (76) to inspire considerable confidence in his statements, at all events such as would justify a series of observations by others on a more extensive scale. Fresh claimants on our notice—germicides and antitoxins—are from time to time brought forward on adequate authority to warrant a trial of them. Who would venture to say that one or other of these agents will not ultimately be found potent enough to overcome the tubercle bacillus or neutralize its poisons? At least it seems a duty incumbent on us to prosecute our investigations into the action of agents whose properties suggest a reasonable hope that they may act in either of these ways. In this relation, then, it is important that cases of well marked phthisis should be admitted into our hospitals in sufficient numbers for scientific study. Further, our duty to the sufferers themselves will be best discharged in connexion with general hospitals. They will there be under the care of skilled and experienced physicians and nurses, who will do much to relieve the complications in the bowels and other organs which are not rare in the later periods of the disease.

A point of importance regarding, if not the legal, at least the moral, claim which these patients have to admission into the infirmaries should not be overlooked. They have in most cases in Glasgow and other towns contributed year after year to the support of these institutions through the workers' fund where they have been employed. Naturally they feel it a grievance that when their time of need comes they find themselves excluded from the hospital which their money has helped to maintain.

Some may think that the care of patients in the condition

under consideration is outside the proper sphere of a general hospital. To this the rejoinder may fairly be made that the prevention of disease is higher service than the cure of it, and that the removal of consumptives from localities where they are foci of infection would establish a new claim on the grateful appreciation by the community of the beneficent work done by our infirmaries.

PAROCHIAL HOSPITALS.

The very poor are better off than the class whose wants and claims we have been considering. They are accommodated in the parish or union hospitals. The grounds for the segregation of consumptives, it need scarcely be stated, exist in them also. Probably the gathering of the males and females into wards apart from other patients would be found easier in many of them than in some infirmaries. It may be mentioned, as showing what is being done for this section of the public, that in a hospital for 1,500 chronic patients in course of erection by the Glasgow Parish Council, there are to be special wards for consumptive patients. It is expected to be ready for occupation in August of the present year. As example is better than precept, it is to be hoped that this enlightened action will prove a stimulus to other parish councils to do likewise.

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¹ BRITISH MEDICAL JOURNAL, December 14th, 1901, p. 1728. ² See Annual Reports. ³ BRITISH MEDICAL JOURNAL, January 11th, 1902, p. 97.

THE ORIGIN OF THE MODERN TREATMENT OF PULMONARY CONSUMPTION.

By A. T. TUCKER WISE, M.D. (DIPLOME SUISSE FÉDÉRAL).
Montreux.

THE present system of treating pulmonary tubercle by nutritious diet (as much as the digestive organs can assimilate) with open-air exposure for the patient instead of shutting him up indoors, originated in England in 1835. Important hygienic reforms have generally originated in the English school. Dr. George Bodington (Warwickshire) carried the plan out in spite of great opposition and ridicule. He was, however, so derided for his innovations that he ultimately found it expedient to give up the practice and turn his sanatorium to other uses.

One of his consumptive patients, treated by him in 1835, whose case is mentioned in Bodington's book,¹ has within the last few weeks written me a letter. This is no "spirit writing," as some might suppose, but a clearly-written, intelligent communication which has reached me through the post. Before announcing what the patient tells me, I will quote Bodington's own description:

In 1835, a young lady, aged 16, who had suffered from occasional pain in the side, cough and debility, returned home from boarding school, where she had been placed under medical treatment for these complaints; she was still ill.... I met several medical men in consultation, and a treatment was pursued in the usual manner, the patient being confined to her room, and consumption gradually wearing her away. After two months of confinement indoors every symptom of the disease had become aggravated; she was now extremely emaciated, suffered from profuse night perspirations, violent cough, and difficulty of breathing. The expectoration was abundant, consisting of mucus mixed with opaque solid portions frequently tinged with blood, most of which sank in water: some floated. There was a dull sound on percussion of the upper portion of the lungs, mucous rattle with a gurgling noise, hoarseness, and weakness of voice. The physical signs in combination with the general symptoms were clearly indicative of the existence of cavities in the upper portion of the lungs.

In the month of January, 1836, the case was left entirely to my management, and having urged my views strongly to her friends, I gained consent to their being adopted.

A donkey was procured, on which the patient began to take exercise out of doors, notwithstanding the inclemency of the season, in the depth of winter. The first trial was unpromising; the cough appeared to be much increased in coming into the open air from the warm bedroom. This arose from the undue closeness and heat of the bedroom, and not the external air. There cannot be a more fatal error than that which arises from the supposition of there being something deleterious in the external atmosphere, because persons cough when first brought into it out of unwholesome heated apartments. The latter should be especially avoided and the apartments kept cool and airy, corresponding in temperature nearly to the external atmosphere, whilst the latter should be courted and indulged in to the utmost.... In the present instance it was soon found that by continuing a long time out of doors the cough abated materially; every day some improvement was observed to take place, very gradual but constant. A sedative draught was given every night, which, together with the exercise of the day, procured sleep and warded off the cough till morning. In the daytime an emulsion mixture

was taken at intervals, and very small doses of morphine, to subdue by degrees the irritation arising from the presence of tubercles in the lungs. The diet was nourishing, consisting of boiled egg, fresh meat, milk and bread, and two glasses of sherry in water daily. This treatment was continued very strictly through the winter and spring months of the year 1836. By June the patient had entirely lost her cough with all the other symptoms of the disease, regained her health and strength, and passed through the succeeding winter in very good health, accustoming herself to go out of doors walking and riding almost daily. At this time (July, 1839) she is in perfect health.

This patient (Mrs. E. M.) writes me from Cheltenham as follows:

Dear Sir.—My cousin, Dr. Bodington, tells me that you wish to hear from me any details I am able to give you respecting his father's treatment of my case when, many long years ago, I was supposed to be hopelessly ill in an advanced stage of pulmonary consumption. As this illness commenced in the year 1835, when I was in my 12th year, you will not be surprised that after the lapse of sixty-six years my memory is rather shadowy about the progress and different stages of my illness, as well as of my uncle's special treatment; but I will only state to you those things of which I have a clear recollection.

In the autumn of 1834 I had a severe attack of measles, which I suppose may have left me in a weakened condition of health. In the following summer of 1835, when at the sea-coast, I took a chill, which ended in a sharp attack of inflammation of the right lung, and was treated by the local doctor in the then usual way with leeches and blisters and other lowering remedies, and for many weeks I was too seriously ill to undertake the long coach journey between Liverpool and Birmingham—for this was before railway days. After my return home late in the autumn my uncle, Dr. George Bodington, then of Erdington, afterwards of Sutton Coldfield, took me under his charge, but was not able during the winter months to pursue his own plan of treatment except with regard to liberal diet, owing to the strong opposition of my dear parents and other relatives, whose prejudices against the new system of treatment were too strong to be overcome.

I grew worse rapidly, my cough was incessant, with every symptom of advanced disease of the lungs, until at length my friends gave way to my doctor's repeated assurance that the only hope of my recovery lay in my being allowed to breathe the fresh cool air and to be out of doors as much as possible.

I think it was in February, or very early in March, 1836, that I was first lifted on to a donkey, for I was too weak to walk, and led round the garden, and in spite of my dear parents' fears the result proved more than they had ventured to hope for. From that time I began to recover strength. The cough and other unfavourable symptoms gradually decreased, and, though the process of recovery was slow, it has been sure, for now, in my 81st year, I am in the possession of fairly good health, and able thankfully to enjoy the many mercies which surround me in my daily life.

I have had some serious illnesses in the course of my long life, and have always needed to be careful in avoiding cold, having had several attacks of pleurisy and occasional bronchitis, but on the whole I have enjoyed remarkably good health, and until the last few years have been able to lead an active life. There is no doubt that the mischief in my lung was entirely healed under the skilful treatment of my uncle, Dr. George Bodington.

If there is any other point on which you desire information, it will give me sincere pleasure to answer any question you may ask, if I am able to do so.

I hope the length of this letter will not alarm you.

Believe me, dear Sir,

Sincerely yours,

To Dr. Tucker Wise.

After the relation of some cases Bodington concludes his book of 60 pages by advocating the establishment of sanatoria (he calls them hospitals) in the vicinity of large towns, where gardening and farming occupations could be undertaken by the convalescent. He mentions, too, "that if the medical profession are to succeed in the treatment of their consumptive patients, they should have country houses in proper situations, well ventilated, and provided with 'all appliances and means to boot,' where their patients should be under their own eyes, and strictly watched and regulated in all respects as regards exercise, air, diet, medicine, etc."

If one peruses his writings carefully it will be seen that nothing of importance in the routine treatment of pulmonary tubercle has been added since his book appeared, except cod-liver oil as a remedy, and rest during feverishness. The main principles, which at the time of introduction were a complete reversal of the ordinary treatment followed in those days, remain unchanged; but we are duly indebted to later workers in the same field, especially Brehmer, for their elaboration and completeness carried out in his sanatorium established in 1859 at Goerbersdorf in Silesia. His additions to the régime of a free use of alcohol and the cold douche have, however, been abandoned.

The later history of the developments and popularity of what is now termed "open-air cure" is not uninteresting. In the year 1865 Dr. Friederich Unger and Hugo Richter, a bookseller, both of whom had not entirely recovered their health in Brehmer's establishment, went to Davos in Switzerland. They had heard of this remarkable climate in the