Aberdeen, has drawn my attention to another very important point, and this is that, however much the total tuberculosis death-rates may vary in different burghs, in some of them the deaths from tuberculous diseases other than phthisis form constantly a higher proportion than in others. This problem merits careful investigation. Many of these cases are of bovine origin, and Professor Hay suggests that it may be—in part, at least—a question connected with the age of the cattle kept for milking purposes. In some parts of the country cows are purchased after calving, and after one season of milking are fattened off, while still young, for the butcher. In other parts the cow is simply a milk producer, and passes through frequent successive calvings and lactations. Obviously, the older a cow is, particularly if it be kept under insanitary and unhygienic conditions, the more liable is it to acquire tuberculosis and its milk to become infective.

THE EXAMINATION OF "CONTACTS" AT A TUBERCULOSIS DISPENSARY.

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IN connection with the work of a tuberculosis dispensary, one frequently hears the use of this term—the "march-past" of the contacts. I do not think a more erroneous or absurd expression could well be found. The examination of tuberculous contacts should be anything but a "march-past." The chief aim of the examination of such subjects is to discover the existence of pulmonary or other forms of tuberculosis in their earliest and most curable stage. This certainly cannot be done by a "march-past." At its initial stage tuberculosis of the lungs is often only recognizable by the most careful objective examination. Many contacts are really subjects of early tuberculous infection, although they themselves may look the picture of health, have no subjective symptoms, and present no complaint that they think worth mentioning. Indeed, many of these persons think it absurd that they should be asked to come to a tuberculosis dispensary at all, and oftentimes it is only with the greatest difficulty that the health visitor connected with the home visiting department of tuberculosis work can persuade such people to come for examination.

The examination of a contact is one of the most difficult and laborious parts of the duties of a tuberculosis officer. If a contact is examined in a superficial manner, the whole aim and object of the examination is in danger of being defeated. Such a person may have, for example, no symptoms such as cough, night-sweats, wasting, feverishness, or general lassitude, and yet the disease may be in an incipient stage. The physical signs may be confined to a few crepitations localized, perhaps, in one axilla, or there may be only a slight prolongation of expiration at one apex. If the examination is done on the so-called "march-past" system, and the axillary region left unexamined, or the apex cursorily passed over, then the contact will probably be sent away with the conviction that he is quite free from tuberculosis. What happens in such a case? The contact rests content on a false security. Perhaps in a few months he develops "slight cough" and feels tired at his work, but these give him no sense of danger. He ascribes such symptoms to being "run down," or due to the development of "a slight cold," because a few months ago he was passed as quite free from tuberculosis. He will declare that he was told by the expert at the dispensary, just three months ago, that he was "quite free from any sign of tuberculosis." If he had not been "marched past" as a contact, the slight cough, and the first symptoms, which developed three months later, would probably have frightened him, and as a result he would very likely have gone to his doctor, and by this time, the physical signs being probably more evident, he would be given suitable advice and treatment. Instead of that, resting on a false security, he continues his vocation, getting steadily worse, till finally he is compelled to seek help. It would then be a just retribution to the tuberculosis officer who had passed him, if the case returned to him in the third stage as an example of his want of care.

The Clinical Examination of Consumptives.

The chief difficulty in the examination of contacts is due to the dubious nature of the earliest physical signs of pulmonary tuberculosis. There are three errors which one must avoid in the examination of a doubtful contact case: (1) Diagnosing pulmonary tuberculosis when such does not exist. The physical signs present in consumptives are sometimes met with in non-tuberculous conditions. (2) Overlooking the existence of pulmonary tuberculosis when it is present. (3) Interpreting the physical signs of pulmonary tuberculosis as evidence of active tuberculous disease when the lesion is an obsolescent one.

In the examination of contacts with dubious symptoms and physical signs, errors cannot be avoided by resting satisfied with one examination only or a mere "march-past." They can only be prevented by securing the repeated examination of such contact cases, and the chief

aim I have had in writing this article has been to show that a tuberculosis dispensary is not a place for the examinations of contacts, so much as a centre for the continued observation of contacts by repeated examinations. A dubious contact should therefore have treatment, and the treatment should be of a passive character until the diagnosis is certain. Continued observation is the great essential. The examination may be repeated every week, every month, or every three months, according to the degree of doubtfulness of the case. The aim is that as few cases as possible of early tuberculosis are to be missed, and that non-tuberculous cases are not to be treated as tuberculous. If the time of the tuberculosis officer permitted, it would be more perfect if every contact were examined more than once. I exclude the contact cases in which the disease is so advanced that there can be no doubt of the presence of active tuberculosis. In many cases the physical signs are so doubtful in contacts that one tuberculosis officer will diagnose the case as pulmonary tuberculosis, while another, equally competent, will dogmatically affirm its absence; while a third will say the case is doubtful and requires watching. I think that the last course in such cases is often the most correct, as it provides a happy medium in the line of service. The diagnosis often depends on the point of view of the tuberculosis officer. One perhaps makes the diagnosis of tuberculosis because, although it may not certainly be of this nature, he thereby avoids all risk of missing the disease, and by treating the case as such he feels that if he errs he is erring on the side of safety, both in the interests of the patient and the safety of others. Another tuberculosis officer is liable to miss a considerable number of doubtful early cases, as he diagnoses the absence of tuberculosis and never sees the case again. According to the method recommended, the contact is kept under observation for some time, allowing his progress to be watched and fully considered in all its bearings. The patient thus avoids the inconvenience of notification, and the possibility of the case being left undiagnosed is also absent. In regard to the three types of error, I will only quote a few cases, but could, if space was available, detail many others:

1. Example of first error. It is possible that if only one examination had been made of this doubtful case it would have been erroneously diagnosed as pulmonary tuberculosis. M. H., female, seen on August 27, 1914, at Bristol Dispensary, with doubtful fine crepitations at the right base posteriorly. Diagnosed as query pulmonary tuberculosis. Seen a few months later, she had some pain in the shoulder and still some crepitations at the right base. She was kept under observation and seen again. On this occasion there were no adventitious sounds, and she was quite well. She was probably suffering from œdema of the base of the lung of a temporary nature, as she was a large, fat woman

whose heart was defective. She remained unnoticed, and was not treated as a tuberculous case.

The physical signs of early cases of pulmonary tuberculosis may be the same as many non-tuberculous conditions. Prolonged expiration with a few crepitations at one apex may indicate early tuberculous involvement, collapse of a portion of lung, or a transient bronchial catarrh. It is only by continued observation of these cases that one can arrive at a definite reliable diagnosis, when tubercle bacilli are absent from the sputum. If the physical signs permanently remain or increase on further examinations, it is more likely that the case is tuberculous.

2. The second error, as above enunciated, is illustrated by the following case: S. W., male, *æt.* 27. Examined on March 1, 1914. Very few symptoms, except readily tired. The physical signs consisted of slight dulness under the right clavicle. Such unequivocal physical signs might be due to a localized collapse of a temporary nature or to a healed lesion. I asked the patient to be sure to return in three weeks for further examination. Instead of this he went to the country for three months. On his return he was much worse, and was sent to bed. The physical signs were now such as evidenced a third stage of the disease, and he was markedly emaciated and very weak. He died three weeks later. If this patient had undergone the frequent examinations desirable, he would have had the necessary treatment sooner, and the disease would have been dealt with in a less hopeless stage.

Error is sometimes committed owing to the evanescent and variable nature of the physical signs of active disease. This evanescence of physical signs is especially common in children, where the physical signs often depend in amount on the degree of pressure of enlarged bronchial glands upon the return flow of lymph from the lungs. The two following cases out of many may be noted as examples: F. B., female, *æt.* 12. Examined December 16, 1914. History of cough, hæmoptysis, and sputum, for years. Numerous loud crepitations and ronchi heard all over both lungs. Re-examined three weeks later, when no crepitations could be detected, and only harsh bronchial sounds here and there. Supposing I had only examined this case but once, and that on the later occasion as a contact, without inquiring into the history, I should probably have missed all the physical signs sometimes present on other occasions, and have passed her as a non-tuberculous subject.—K. S., male, *æt.* 8. On first examination numerous crepitations and rhonchi all over both lungs. On a second examination a few weeks later almost no physical signs.

Another reason for the thorough examination of doubtful contacts, and deciding whether the physical signs are due to pulmonary tuberculosis or some other condition, is due to the psychological condition of

the contacts themselves. For example, in a family a case has died of tuberculosis of the lungs, and the contacts are examined. Perhaps all the contacts of this case are then found free from disease. It is impressed upon them, however, that on the appearance in the future of any symptoms, such as cough, expectoration, etc., they should at once return again for thorough examination. Such advice is necessary, or probably they will not return at all until too late. The result is, however, that frequently they return for examination when the symptoms are not due to tuberculous disease. It is then the duty of the tuberculosis officer to decide the difficult question of whether the symptoms are due to tuberculous involvement which the contact is afraid of or due to other causes. To take a concrete example: A father dies of tuberculosis in December, 1914. In the following January the children were examined at the dispensary and found free from tuberculosis. Six months later one child developed a lobar pneumonia of a mild type. It was kept in bed as a feverish cold, but the cough and expectoration did not disappear. The child, recovering from the acute attack, was brought to the Dispensary. Crepitations and dulness were found at the base. The mother was anxious to know if the child was tuberculous, like its father. These signs and symptoms may all be due to an unresolved pneumonia, which will clear up as the child grows stronger. They may be due to tuberculosis of the base, or they may depend on an unresolved pneumonia infected by tubercle bacilli. This question can only be decided by careful further examination, not by a "march-past." In such a case it is sometimes better to treat the general condition, and see if the physical signs clear up. A Von Pirquet test, if negative, would in the view of some be of value. Also a "contact" of the same family may develop a bronchitis or asthma, which sometimes presents physical signs very like that met with in chronic tuberculosis. The patient comes to the dispensary to be relieved of doubts. It may require continued observation of such a contact to be able to relieve such anxieties.

3. And now as to the third error. A very large number of people living must have physical signs indicative of old tuberculous trouble. When one considers the figures of Hamburger and Monti, who found 97 per cent. of the children between the ages of fourteen and fifteen in the schools of Vienna react positively to the Von Pirquet test, one realizes the difficulty experienced in early contact cases presenting some physical signs of saying whether these are due to active or passive disease. These 97 per cent. of schoolchildren must presumably have had physical signs of tuberculous disease. The physical signs need not, however, be perceptible to our present means of investigation by physical examination. They might be only microscopic, but a microscopic focus may become active and advanced disease in a

few weeks. A contact may have physical signs of tuberculosis, but not necessarily require treatment. Such a case, if it had not come to the dispensary, might have passed through life oblivious of the existence of any suspicious signs of latent trouble. Possibly many of us in apparent robust health have even now very slight physical signs of an old tuberculous lesion; but not having been, as far as we know, contacts, we never knew, and never will know, the threatening danger. In many such cases, to prove whether slight physical signs are due to an old focus, which can best be left alone, can only be accomplished by repeated examinations and prolonged observation. I have met with many cases in my own experience in which the physical signs were probably due to an obsolete focus, but in which treatment of an active nature was being given. Here is an example:

L. Y., female, æt. 18. Examined by myself on two separate occasions—first on November 12, 1914. She then had slight prolonged expiration at right apex, slight increase in vocal resonance, and a little retraction at same area. Weight was 53·7 K. No symptoms. I put her down as doubtful, and asked her to return in three months. Re-examined on February 7, 1915. Physical signs found exactly the same as at first examination. Weight 54·2 K. Asked to return in two months. Re-examined. She then left my district, and was seen a month later by my colleague in his district. He diagnosed her as possible pulmonary tuberculosis, but the physical signs were still the same and her general health was no better and no worse, and still there were no symptoms. She is now being treated, and the condition remains the same. In all probability the condition would have remained the same for the rest of her life without any treatment, but she would require to be kept under close observation for about a year to be sure of absolute quiescence.

The Examination of Contacts.

I think by these remarks I have shown that a tuberculosis dispensary should be a place, not for a "march-past" of contacts, but for the continued observation of contacts. The examination of contacts should therefore be very complete and thorough. The history past and present should be inquired into as carefully as, if not more carefully than, in an ordinary case sent up for diagnosis and treatment. A contact in perfect health, unless asked, will rarely volunteer the information that he or she has had a hæmoptysis or pleurisy years ago. The local dulness, retraction, or bronchial breathing, found on examination of the chest, will be explained and regarded as a possible lurking source of future trouble, and requiring watching from time to time. First, careful history-taking is essential. Second, careful questioning as to present symptoms, however slight, must be insisted on. Third, careful physical examination

must be made. The chest must be stripped to the waist, and the whole of both lungs carefully examined by the usual processes of inspection, palpation, auscultation, and percussion. If dubious signs are noted, the other more laborious tests may have to be applied—perhaps tuberculin diagnostic tests made, effect of exercise on temperature noted, opsonic index taken, albumin tested for in sputum, and so on.

These measures require far more time than the majority of tuberculosis officers can spare, but it is just in suspicious contacts that such data are required. In child contacts the same routine must be gone through, but also as a routine procedure one should investigate for the presence of tuberculosis in the bronchial glands. For this purpose it is necessary to examine for the presence of small nodular glands in the supraclavicular area; these are known as Philip's nodes. The presence or absence of distended venous radicles on front or back of the chest may be of importance. Eustace Smith's sign may be tested, and Ewart's area can be mapped out. With the presence of such signs as (1) Eustace Smith's murmur, (2) distended venules, (3) Philip's nodes, (4) enlargement of Ewart's area, (5) altered spinal percussion, (6) dry hacking cough, and (7) prolonged expiration and dulness of one apex, one can safely diagnose tuberculosis of the bronchial glands. If the case were X rayed, one might confirm the diagnosis still further. Such a case can usually be cured by a course of tuberculin, the glands becoming fibrosed and the tubercle bacillus isolated. A tuberculosis officer should attempt to deal with as many children at this stage as possible. It is even more difficult in such a case to decide whether actual treatment is necessary or not. This will depend more on the presence of symptoms and general condition than on physical signs. The important routine is, therefore, the continued observation of contacts. Frequent observation requires the keeping of records of all contact cases very accurately. I have found such a record, which I have kept for two years, extremely interesting and useful. This record is best kept in the form of a book called a "contact book." On one page there should be a column having the following headings:

Date.	Name.	Age.	Address.	Contact of.	History and Physical Sign.

On the opposite page the various cases can be continued, and the page divided into vertical columns, where the results of future exami-

nations can be recorded if the case requires further observation. A careful record of the weight of all doubtful contact cases must be kept. An increase or decrease in weight at a future examination is of value in determining as to the quiescence or activity in the physical signs of a doubtful contact case.

It may be of interest to give the results of my own personal records during a period of nineteen months. Of 123 contacts examined in this period at the Bristol Tuberculosis Dispensary, 39 per cent. had doubtful physical signs of active pulmonary tuberculosis, while 13 per cent. had positive physical signs. Of these 13 per cent. (4 per cent. were positive at the first visit), 9 per cent. were doubtful, but became positive on further examination. Forty per cent. had negative physical signs, and only 6 per cent. having doubtful physical signs became negative.

Of 193 contacts examined at Bath Tuberculosis Dispensary, 44 per cent. had doubtful physical signs of active tuberculosis of the lungs, 12 per cent. had positive physical signs, and of these 4 per cent. were positive at first visit, and 8 per cent. doubtful became positive. Forty per cent. had negative physical signs of active tuberculosis, and 3 per cent. having doubtful physical signs became negative.

Of 148 contacts examined at Radstock Dispensary, 37 per cent. had doubtful physical signs of active tuberculosis, 14 per cent. had positive physical signs, 40 per cent. negative physical signs, and 7 per cent. of doubtful cases became negative.

Out of the total 464 contacts examined, 40 per cent. gave doubtful physical signs of active pulmonary tuberculosis, 13 per cent. positive physical signs. Of these 7 per cent. were positive at first visit, and 6 per cent. doubtful became positive. Forty per cent. gave negative physical signs, and 5 per cent. having doubtful physical signs became negative.

All together, 51 per cent. had, therefore, doubtful physical signs of active pulmonary tuberculosis in the total 464 contacts. Eleven per cent. had doubtful physical signs in which, by further observation, one was able to decide whether it was an active or a quiescent lesion. Taking these 51 per cent. separately, it is shown, therefore, that in 20 per cent. of doubtful contacts, by continued observation, one can decide definitely whether the signs are due to a lesion still active or if obsolete. In the other 80 per cent. doubtful contacts the physical signs remained, but showed no change, and no symptoms developed in the period in question—therefore probably quiescent. If the physical signs had increased or symptoms had developed, such would be put down as positive. If the physical signs disappeared and no symptoms developed, such would be classed as becoming negative. If, therefore, 20 per cent. of doubtful active disease can be proved definitely active or quiescent by continued observation at the dispensary, I have shown that the continued observation of contacts is worth the trouble, especially if

the 12 per cent. becoming positive thus insure obtaining treatment at the earliest stage.

Fifty per cent. of the contacts required, therefore, continued observation. One of the chief functions of the tuberculosis dispensary is to act as a centre where contacts can not only be examined, but can be kept continually in touch with and kept under careful observation.

THE BEDROOM OF THE CONSUMPTIVE.

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Success in the treatment of consumption depends largely upon close attention to detail. The home hygiene of the patient is admittedly of paramount importance. The circumstances of each individual patient require fullest consideration, and, in many cases, anxious thought, before satisfactory arrangements can be made. Herein lies much of the failure of domiciliary treatment. In the majority of cases the busy general practitioner has in the past either not thought it worth while, or has not found time to care for such details. It is only with the advent of dispensary supervision that the home treatment of consumption on a large scale has been placed upon a satisfactory basis. The tuberculosis officer and dispensary nurse supply those essential elements in the home treatment of phthisis that have hitherto been more or less neglected.

Owing to various causes, principally economic, the majority of consumptives perforce spend the greater part of their time at home during their illness. During this time the night, and not seldom, if the supervision is efficient, the day also are passed in bed, owing to rise of temperature or other causes. One of the greatest dangers to which persons suffering from pulmonary tuberculosis are exposed while at home results from conscious or unconscious neglect to stay in bed when they are feverish. The circumstances connected with the bedroom are thus clearly of importance, and demand careful attention for the sake of the other inmates of the house, as well as of the patient. The ideal aimed at is to prevent the spread of infection to others in the house, and at the same time to place the patient under as favourable conditions as possible.