I trust that in this short and quite imperfect paper I have said enough to arouse some interest in what, to my mind, is a very important factor in our treatment of many, if not all, of those entrusted to our care, and I hope at a future meeting to enlarge more fully upon this very necessary study of the temperament, disposition, character, and habits of our patients.

(1) *Our Temperaments,* Stewart.

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## *Some Points connected with Tuberculosis in Asylums.*(1)

By W. F. MENZIES, M.D., M.R.C.P.

THE subject of tuberculosis in asylums is by no means a new one. On the contrary, many have written upon it, probably long before Dr. Clouston, forty-two years ago, published his well-known remarks. It would be neither profitable nor desirable to enter here upon a discussion of the individual views expressed from time to time, but for many interesting and instructive observations it is only necessary to turn to the papers presented to this Association of recent years by Drs. Crookshank, Blair, France, Weatherly, Drapes, and others. This being so, you will not expect to hear anything new from me; in fact, I do not think I can lay claim to a single original observation; but as no one paper deals with any large portion of the procedure to be observed in combating the spread of tuberculosis in our asylums, and as my attention has, for the last nine or ten years, been directed to the problem of how to reduce the death rate without any great expenditure of money, I have thought it well to introduce a discussion rather on the actual details of procedure than on the principles involved, in order to stimulate the expression of opinions of all sorts; for it is evident that there are many equally good and efficient ways of arriving at the object which every asylum medical officer desires.

Although of late years the majority of superintendents have been at more or less pains to reduce their tubercular death rate, yet one still meets with one now and again who adopts a fatalistic *laisser-faire* attitude. And certainly it seems as if at one period the efforts of our predecessors were in danger of being lost sight of. In the eighties and early nineties we did not

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look with alarm on a high tubercular death rate. Until about this time the asylum rate seems to have been gradually falling, although not in corresponding ratio to that of the sane population, but since then it has, until the last few years, tended to rise, a result which I attribute to the gradual introduction of heating apparatus in asylum buildings, especially dormitories. The interest shown by this Association culminated in the appointment of the Commission on Tuberculosis, but unfortunately, the results arrived at were far from satisfactory. A more disappointing document than this Report I for one have yet to witness. The mountain which produced the proverbial mouse was nothing to it. The schedule of questions was alone sufficient to condemn it before any conclusions were arrived at. But possibly the Report was a blessing in disguise, for it set people trying to solve for themselves some of the difficulties which it had been hoped the Tubercle Commission would solve for them.

Although it is true that many mental conditions may be associated with phthisis, and that there are many varieties of the so-called phthisical insanity, yet I have never been able to associate myself with those who declare that there is one clinical form in which the disease can be diagnosed, apart from physical examination, by the cerebral signs alone. It always seems to me that observers are unconsciously influenced, either by the revealed presence of phthisis on examination or by the facies of tubercle, to which I shall refer later. What appears from my own observations is that tuberculosis, generally pulmonary, is the determining factor in the production of an appreciable percentage of cases of acute insanity, either in higher-grade aments or in primary adult cases, and that its presence cannot distinguish the case, without physical examination, from any other form associated with defective hœmopoietic conditions. In 1903, 3·2 *per cent.* and in 1904, 2·5 *per cent.* of the admissions to Cheddleton showed evidence of early or advanced tuberculosis. Some of them were epileptic, some imbecile, some general paralytic, but at least half were types of excitement or depression of recent origin—from a few days to a few weeks. We know that tubercle is fairly far advanced when physical signs appear, certainly a few months at least, omitting the rather rare acute miliary form, which is generally fatal before removal to an asylum, so that in the cases mentioned the mental signs followed closely upon the physical disorder. This is a branch of the

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subject to which I hope to return at some future time, as long observation is required before it can be established or disproved, but I must here claim it as an axiom that *an appreciable percentage of primary adult insanity is precipitated by one of the known causes of defective hæmopoiesis, namely, tuberculosis.*

Now these early cases of all sorts among the admissions are to be regarded as the *fons et origo* of our large death-rate. Some of them rapidly recover, but as a rule recovery is slow, or chronicity supervenes. The epileptics infect their ward, the general paralytics infect the physically infirm in the infirmary. But it is chiefly the chronic residue which causes the trouble, for they infect many others around them, and especially those who are working in dusty places, the upholsterer's or stonemason's shop, or the bakehouse. And each in turn becomes a fresh centre of infection, until this position has been arrived at, that a collection of human beings in an asylum, whose every act is supposed to be regulated by a scientific medical superintendent, shows a tubercular death-rate at least ten times as high as that of the general population at corresponding ages outside, and which is in a position of great inferiority from a sanitary standpoint. This is certainly a nice state of affairs, and one wonders how we can have stood it so long. There are a good many points in asylum administration in which our ideas have become hoary and crusted. This is one, and it is decidedly humiliating that we should have to follow outside teaching, when we might have led.

The subject falls naturally into two parts, diagnosis of early cases on admission, and prevention of spread. It will be quite unnecessary to discuss the ordinary physical signs of evidently advanced cases, or the special medical treatment of these, as our present concern is more with the preservation of a healthy standard among the uninfected, and so the treatment of those already infected is of importance in so far only as they are a source of danger to those around them.

### *Diagnosis on Admission.*

(1) *Temperature.*—Although so many sane tubercular subjects have a normal temperature for prolonged periods at a time, I doubt if many cases of at least the more active types of insanity are free from tubercular fever when admitted, because the

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decision to certify has generally been caused by some train of insane acts which in themselves tend to raise the temperature of a tubercular individual, while the mental excitement of removal to an asylum will have the same effect upon the more rational ones. We can weed out at least 90 *per cent.* by this means. The temperature of every fresh admission should, for the first week, be taken in the morning, and at 2, 4, and 6 p.m. I have not personally met with any cases whose daily rise was not covered by one of these hours. Axillary temperatures are notoriously unreliable, on account of thinnesss, muscular movement, chilled skin, carelessness of nurses, etc. Even the mouth is not a true index. Either the rectum or, in sensible males, the issuing stream of urine should be used. All cases who present any rise are gone into more fully, and if no other satisfactory explanation is forthcoming, like constipation, sepsis, etc., are removed to the phthisical ward and set aside for tuberculin injection when the temperature has become normal. Meanwhile they are to be treated by strict rest in bed.

(2) *Physical signs.*—It is most important to account all suspicious physical signs, however slight, as positive evidence, until tuberculin has disproved them. Flattening of a part of the chest, the slightest rise in the percussion note or increase of resistance to the tap, especially in the subclavicular or supraspinous regions, some slight derangements of the normal breath sounds, such as diminution at the apices, jerky or cog-wheel breathing, some fine crepitations after full expansion of chest and coughing, especially in the region of the right middle lobe—any of these generally means either old or active tubercle. I cannot agree with Dr. Latham that slight departures from the normal are found at the apices, especially the right (except, of course, the higher note of greater muscularity) in healthy individuals, especially those with emphysema. I believe that these are practically always signs of old adhesions and consolidation, and we know how liable such persons are to reinfection from what we see at *post mortems.* One cannot help noticing how much commoner "short wind" is in the athletic members of tubercular families than in others of more healthy heredity, and it is quite possible that there is an inherent difference in the amount of muscular tissue in different lungs which may determine both emphysema and tubercular infection.

(3) *Tubercular facies.*—As an aid to diagnosis this is not

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to be despised. It can best be described as comprising the features of one or other of the tubercular diatheses in combination with the aspect of active anæmia. I have seen several of these cases lately in which neither physical signs nor fever was at first present, but the resistiveness to mental improvement and fattening made one almost sure there was tubercle, and later its presence became certain. But, naturally, if the patient has before admission been under medical treatment the greasy pallor does not appear.

(4) *Weight.*—Although this does not apply to recent admissions it is well to mention it. As in most asylums all patients are weighed monthly, it is easy to detect any decline extending over three months, and eliminate cases of excitement, general paralysis, other physical ailments, overwork, and such causes. Cases where the loss is explained by anorexia are especially suspicious, as is also a relapse into depression of a chronic case, or when one has been working in the upholsterer's or mason's shop or bakehouse.

(5) *Tuberculin injections.*—When Koch first introduced his tuberculin I used it extensively, like everyone else, and many patients suffered from overdosing. This year I am trying it in moderate doses, 1 to 5 milligrammes, and if the statement is true that these doses when injected in the absence of fever are harmless, it is evident that an extension to all admissions indiscriminately will settle the question with ease and certainty. Suspects can be injected at once, but the process should be pursued in the phthisis ward; in fact, no suspect must be kept in the admission ward at all.

### *Prevention of Infection.*

(1) *Segregation.*—One cannot help thinking that the indiscriminate craze for special sanatoria will ultimately lead to a discrediting of this, by far the ideal, method of treating tubercular diseases. Public bodies are finding that their rates will not stand the burden of providing them for the poor. This is a pity, because their educational value has been very great, and each patient treated in one becomes a zealous propagandist of the doctrines of healthy living. But sanatoria are expensive, both to construct and maintain, and so it is little wonder that many superintendents of asylums, realising that they cannot

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have a separate hospital, are likely to attempt no special treatment at all. The requirements of asylum sanatoria are almost prohibitive; for they must be miniature asylums, complete in every detail for treating every class of the insane—convalescent, epileptic, chronically excited, idiots, clean and dirty, sensible and incoherent; and if we do not include *every* case in such a building there seems really little use in incurring the expense of treating any.

But there is no reason why we should not set aside one ward on each side for known and suspected cases. Every asylum possesses a suitable ward. It must have an observation dormitory, with as many single rooms as possible opening directly therefrom. The night and day space must be well separated, and it should open directly into an airing court by its own door without the necessity for entering the main corridor. By preference it should be a first-floor ward, in order to obtain more air. The airing court is, of course, to be reserved wholly for the use of the phthisis ward. To this ward are removed all established cases and suspects. There should be no danger of cases sent in error being infected if proper precautions are taken. The inmates of the phthisis ward must never mix with the other patients, either in the dining hall or chapel or at entertainments. They must receive visits from their friends in the ward and not in the visiting room. The single exception is that the early and robust cases may go out with working parties, for the tubercle bacillus is not resistant to diffuse daylight, and those far enough advanced to have much expectoration are not strong enough for anything more than light gardening in their own airing court.

You may say that their life is monotonous, that it is not worth living, and so on. One critic even presupposed serious mental damage to these patients. My answer is to ask whether an asylum patient is more or less responsive to monotony than a sane phthisical case who realises the gravity of his state. If sane persons can be contented and happy in a sanatorium, how much more will a lunatic be, for his creature comfort is his great aim in life. He is better fed than the healthy patient, he does less work, he has plenty of time for reading and billiards, he goes out walking every day, instead of wheeling a barrow or digging. His open-air life induces a vigorous appetite, and his looks belie the state of his lungs. He regrets the absence of

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tobacco, but soon accustoms himself to the loss. A very fair percentage recover and are discharged, and altogether, after two years' trial, I say without hesitation that the phthisis ward is far from unpopular in the asylum hierarchy—not half so unpopular as the chronic working ward. There are never more than two or three cases in bed at one time, and the influence of these is altogether far less depressing than the infirmary sick-room.

The following remarks on the subject of prevention must be understood to apply to the whole of the asylum, and not to the phthisis wards only. When a distinction is to be made it will be specifically mentioned.

(2) *Windows.*—In the phthisis wards we keep the dormitory, dayroom, corridor, single-room, and sanitary annexe windows open top and bottom, five inches clear, night and day, summer and winter, except only the north windows when there is a very cold gale blowing in winter. This is not often, and most of the windows face east, south, or west. In a ground-floor ward one could take the window-sashes out altogether, and I have seen in some asylums the excellent method of replacing the sash by wire netting. Still, it is convenient to have a sash which can be shut under exceptional circumstances. By a small adjustment of the ordinary sash-lock the windows can be fixed immovable in any position. In the other wards throughout the asylum the dormitory windows are fixed five inches from the top only, the bottom sash in these, and both top and bottom sash in the day-rooms, being free to shut or open up to the maximum of five inches. The dormitories I look upon as most important, for there is evidence that a large part of asylum infection takes place at night, and that the time element required is somewhat prolonged. There is no other way, in the absence of an attendant, to keep the windows open, except locking them. It is surprising how soon the patients become accustomed to the low temperature, and how soon they come positively to like the gale blowing in on their heads. Of course, in cold weather a great many blankets are required—six, or even, in some cases, seven per patient. The initial cost is heavy, but good blankets last for many years. Some doubt has been expressed as so whether the Commissioners' requirements of cubic space in asylums are sufficient. Seeing what an expense in building would be entailed for every additional

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foot, we should pause before recommending an increase, and the truth is, probably, that with thorough ventilation three fourths of the present allowance would suffice, but with all the windows shut ten times would not be enough. In the main corridors of the asylum every window is kept open night and day, and there is no heating. Patients do not catch cold in passing rapidly from one ward to another, especially if inured by custom.

(3) *Ventilation of single rooms.*—Two years ago we had all our single rooms ventilated by cutting out the upper panels of the shutter and two of the panels of the fanlight above the door, and filling them in with perforated iron sheets, the holes in which were set as close together as was consistent with strength, and one third of an inch in diameter. The single room and gallery windows being open, a current of fresh air can blow through the single rooms night and day. I have always regarded this single room question as very important, for the atmosphere of an ordinary asylum single room at 3 or 4 a.m. is a thing never to be forgotten. It is not denied that in the old days, twenty years ago, before we heated our single rooms, we got many deaths from collapse. These we now escape by leaving the heating apparatus on in winter and the windows open. In the case of a delirious patient who throws off his clothing we can close the windows for one or two nights, and the temperature rapidly rises. But this is only occasionally required, and is only done by medical order. I have no heat on in any dormitory or sick-room except the infirmary, but all the day rooms are heated, for these can be regulated by the attendant, and there is a standing order that the temperature is to be kept between 10° and 12° C.

(4) *Spittoons.*—In the phthisis wards no tobacco is allowed except to the robust, sensible cases who do not spit. Anyone seen expectorating is deprived of tobacco. For the advanced cases spitting mugs are provided, containing a little lysol or formalin and soda, and these are emptied down the water closet four times per day, and the mugs scalded with boiling water. In the ordinary wards spitting is discouraged by every possible means, and again the most potent measure is to stop the tobacco of anyone seen expectorating. No spittoons have ever been provided at Cheddleton. It took two or three years for the attendants to cure themselves of the habit of expectorating, and now, after six years, although not stopped

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entirely, the amount of spitting among the patients is not 10 *per cent.* of what it was. Dirty patients who cannot be entirely cured are kept in bed in a single room while in the ward, and I have never seen yet even an idiot who could not be greatly improved by careful training.

(5) *Fibre mats.*—These are a constant receptacle for expectoration, and are a source of serious danger. I should like to see them wholly banished from asylums, were it not for the difficulty of finding suitable substitutes. They must be reduced to the lowest possible number in the general wards, and in the phthisis ward are never permitted. The best thing I can think of is a large piece of coarse sail-cloth laid on the floor of the entrance corridor, upon which the patients are taught to scrape their boots. This large rug is kept in duplicate, and sent to the laundry weekly. Patients remove their boots on this before stepping into the boot-room, and the infected mud is rolled up in it to be shaken outside.

(6) *Heating coils.*—Next to fibre mats I look upon these as among the most common means of propagating phthisis. Naturally engineers prefer to have them with closed sides and open gratings on top, because they give a better upcast for the hot air. This open grating makes a most convenient spittoon, as well as a receptacle for all sorts of filth, dust, paper, and rags. The current of hot air dries these and carries the bacilli broadcast in swarms. Coil covers should be made as ornamental pillars higher than a man's head, with a close-fitting door at floor level for cleaning. Or they may be abolished altogether, and the pipes carried in cases round the windows, so that the incoming air is warmed. Those which heat the same used-up air over and over are bad, and most electric radiators are of this type. All covers should be made so that they can be lifted off bodily each week by the attendants, and all coils should have a local valve to shut off the heat. They may be allowed to cool over night, and in the morning first wiped with a rag dipped in chloros solution, then scrubbed with soap and a hard brush, and when dry thickly blackleaded. Coil covers already in position may be easily altered by fitting sheet-iron over the top grating, raising the cover 4 or 5 inches on angle-irons, and filling up the space thus left just below the top with fine perforated zinc or gauze. Direct high-pressure steam is rarely used in asylum wards on account of its obvious disadvantages.

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But it probably rapidly sterilises any bacilli falling on the pipe. Hot air or hot water is the dangerous medium. In cleaning the coils the inside of the casing should not be neglected. Another part of the system too often overlooked is the calorifier or coil chamber in the basement, which generally supplies hot air to a row of single rooms. This is easily fouled by dust and filth pushed through the gratings, or by cats, rats, mice, and insects. Frequent inspection is required, and a routine scrubbing with chloros at least twice a year—before the heat is turned on in autumn and after it is turned off in spring.

(7) *Air-flues and Tobin's tubes.*—The state of filth of these after a few years' use is astonishing, and especially are the so-called upcast shafts in the chimneys dirty. If these always acted in one direction one could neglect them, but the columns of air are in a ward nearly always upwards in some and downwards in others. The whole theory of currents actuated by differences of temperature as a means of warmth and ventilation is faulty, for transfusion and radiation are such weak forces when opposed to perflation. Cross ventilation by open windows is the simplest and safest for asylums, and I am glad to see the Lunacy Commissioners are no longer recommending expensive and complicated air-shafts. The plenum system may be excellent for hospitals, but it is quite unsuitable for asylums, and besides is very expensive. If air-ducts are retained they must be cleaned throughout every year, and whitewashed with lime and chlorinated lime mixture. Tobin's tubes can be simply taken away altogether.

(8) *Ward cleaning.*—I wish I could say that I have been able entirely to abolish dry sweeping and dry dusting. Attendants and nurses slowly improve, but with patients doing so much in an asylum the struggle is incessant, unless one threatens to dismiss the first *employé* detected permitting it. Hair brooms are so nice to brush up crumbs, and carpet-sweeping machines refuse to take the larger particles. The streaky marks left by wet cloths on polished floors are the trouble. But if after mopping the dust with a wet broom one allows the floor time to dry, a cloth wrung out of very dilute ronuk and turpentine removes the streaks and the polisher easily puts a surface on again. No real progress can be made in the prevention of phthisis until dry sweeping and dry dusting are absolutely abolished.

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In the phthisis ward the chief danger of bacilli lies on the floor and dado. Wood dadoes are unsuitable, as it is difficult to clean them, and pitchpine alters so much with varying heat and dampness that chinks cannot be caulked. Still, most of the bacilli can be tackled by wiping the dado and all the ledges daily with cloths damped in formalin solution. Soap and water are, of course, necessary for any dried sputum or other visible dirt. Wet sputum, fæces, etc., can be wiped up with a chloros rag, which is immediately burned.

Curtains should not be allowed in the phthisis ward, but in the other wards there is no objection to them so long as they are of washable materials, and are washed every two or three months. Carpets and stuff mats should be discouraged as much as possible; in the phthisis ward they are forbidden, and even bed-carpets are not issued. It is a good plan to put a layer of mackintosh under the carriage-cloth on furniture, so that this can be washed with a soapy brush when soiled, or dabbed with formalin, without the water getting into the horsehair. Couches, easy chairs, and cushions should, wherever possible, be thoroughly beaten outside the building on the weekly cleaning day. Tile and stone corridor floors can be scrubbed daily, but soap is really only required once a week, except in the phthisis ward. Chloros is added to the water once a week (on a different day from the soap) but in the phthisis ward is used every day. Water-closets should be thoroughly scrubbed with soap and water daily, especially the woodwork. It is a good plan to do this in the evening and allow the wood to dry over-night, oiling it in the morning before the patients use it. Chloros must be used daily in the phthisical ward, the solution being afterwards poured into the pans and down the slop-sinks. All patients who are excited and spit must sleep in single rooms, and these may be scrubbed out every day and afterwards sprayed with formalin, which is less destructive to parian or pytho dadoes than chloros. The main asylum corridor should be scrubbed with weak chloros once a week.

(9) *Laundry.*—The female phthisis ward at Cheddleton is only a few yards from the laundry yard, and the male phthisical clothing is not brought along the main corridor, except in very bad weather, but is carried outside to the laundry yard. Here the attendant and laundress check it over and it is put direct, the cotton goods into a boiler which is standing ready full of

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boiling water, the woollen goods into weak chloros; the latter are kept there over night. I find the chlorine acts less on wool than on cotton, and boiling naturally shrinks wool too much. After this preliminary disinfection the clothing is allowed to mix with that from the other wards.

(10) *Diet.*—The great fault of the ordinary asylum diet-sheet is the deficiency in fat. The proteid allowance is also low, but not so strikingly so. In some asylums green vegetables are not supplied all the year round, but this certainly does not apply to the Staffordshire asylums, whose tubercular death-rate is high. Fats and proteids are expensive articles, but I am satisfied we do not give our patients enough fat. The best margarine is more palatable and far cheaper than indifferent butter, and I have found it necessary to increase the allowance from $\frac{1}{2}$ to $\frac{3}{4}$ ounce per meal, although this means an extra penny on the weekly maintenance rate. Asylum meat loses much of its fat when baked, as is usually done, in the baker's oven; there is no basting and much of the fat is burned, the temperature being kept too high in the later stage of the process. It may be possible to add good linseed oil to cooked vegetables, and we are at present experimenting with this in order to try to present it in a thoroughly palatable form. It is cheaper by far than cod-liver oil.

(11) *Upholstery.*—The upholsterer's shop is responsible for many cases of tubercular infection. When the Cheddleton extensions are complete we hope to have an open shed for teasing the coir and hair, and a powerful fan to blow the dust away, also a cheap spraying chamber where formalin vapour can penetrate the hair, and warm air dry it quickly. It is useless to talk of disinfecting by steam. Good hair costs 1*s.* 3*d.* per lb., and steam at once makes it crack and break, so that it soon becomes useless and can never be used twice. At the same time, re-infection cannot always be blamed for hair-pickers' deaths, for the dust is probably the more dangerous agent. I have noticed in those dead of tubercle who had worked for a few months in the upholsterer's shop a very large percentage of old caseous nodules at the apex, which possibly the irritation from dust had merely stirred up again. One would like to banish upholstered furniture entirely from the phthisical ward, and no doubt this will come in time.

(12) *Handkerchiefs.*—This is a difficult subject. At best

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the asylum patient of the lower class does not set much store upon any sort of handkerchief. I have of late been trying Japanese paper in the phthisis ward, but the great difficulty is to get an antiseptic into the pulp without destroying the sheet. Besides, they are rather expensive, 13*s.* per thousand, and each patient requires at least two per diem. At first the patients persisted in using them for water closet purposes, but in time they became trained to appreciate them. It is necessary, if they are to do any good, to have a pile of them on an open shelf in the day-room, so that patients may help themselves freely. They must be burned before they are completely dry. Another good way is to leave out a large supply of ordinary cotton handkerchiefs, and have a tub of water in the sanitary annexe into which the patients are taught to throw them after being used once. They can be removed and boiled daily. This free supply of handkerchiefs is, however, somewhat of a danger where the phthisis ward contains suicidal patients, and the attendant needs to exercise extra vigilance.

(13) *Animals.*—If one disallows cats one gets mice and rats, and these are as potent carriers of tubercular infection. Rats can be eradicated from a new building, but I have yet to learn how mice can. In general it is better to have cats in the general wards, but to exclude them from the phthisis ward, trusting that the mice will take some time to discover the local exemption. About flies I can say nothing; we rarely see one at Cheddleton, as it is a new building, with no trees or large bushes about, exposed to all winds, and generally cold even in summer.

The above are the points in combating tubercle to which my attention has been principally drawn. No doubt there are other methods of infection, and I have said nothing about milk and meat, as Koch's opinions are still under discussion by the Royal Commission. In any case the patients in the average pauper asylum have little milk which has not been boiled, and I do not attribute much infection to it. No doubt also other members have solved the above problems in different and often better ways, and it is in order to stimulate the expression of their views that I have ventured to bring forward the subject at this time.

(1) Paper read at a meeting of the Northern and Midland Division at York, May, 1905.

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