endeavoured to follow out the indications derived from the more purely scientific study of the conditions.

The late Dr. W. P. Mears, guided by the previous clinical experience of himself and others, three years ago adopted a diet the important element in which was meat. As accumulating experience indicated its superiority in one form or another to other diets for all classes of cases of pulmonary tuberculosis, he more and more insisted on its adoption in this sanatorium, especially in cases commencing treatment. Since his death results have amply justified his methods, and they are adhered to if possible more closely than ever.

I have to thank Dr. W. R. Philip for affording me the opportunity of examining the blood of the dispensary cases quoted above, and for many valued suggestions in the course of my work.

NOTES AND REFERENCES.

¹ Von Limbeck Clinical Pathology of the Blood, p. 231, New Sydenham's Society's Transactions. ² Metabolism of the Nucleins, *Journal of Physiology*, vol. xxiii, p. 229. ³ Von Limbeck, loc. cit., p. 231. ⁴ I examined blood films taken from tuberculous patients at the Victoria Dispensary who had undergone no treatment. In these cases the highest number of eosinophiles was 5 per cent. All the films were taken in the afternoon, when food absorption was going on, or had recently taken place, and when the numbers of eosinophiles would probably be relatively or absolutely diminished. The number of cases was too small to warrant any conclusions being drawn. ⁵ Only those counts which agreed with the general appearance of films taken at the same time were accepted as correct. ⁶ Neusser, *Wien. klin. Woch.*, 1892, p. 42. ⁷ Muir and Ritchie, *Bacteriology*, 1902, p. 226. ⁸ *Ibid.*, p. 458. ⁹ *Ibid.*, p. 465. ¹⁰ BRITISH MEDICAL JOURNAL, December 14th, 1901.

THE SANATORIUM TREATMENT OF PULMONARY TUBERCULOSIS WITH ESPECIAL REFERENCE TO NORDRACH METHODS.*

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AFTER some preliminary remarks on the history of the treatment Dr. Hichens said: I propose to discuss the details of the open-air or sanatorium method of treating consumptives; to put before you briefly the results obtained by this method at a few of the chief sanatoria in the British Isles, to compare these results with those obtained at high altitudes, and finally to see if we can draw any conclusion as to what advice we should give our patients.

In Germany the lines of treatment adopted divide themselves into two somewhat opposing camps. In all cases the patients have or are supposed to have abundant fresh air and a nourishing and abundant diet but a difference of opinion has arisen as to how much rest or exercise should be given. One camp advocates what may be called the "Rest-Cure" or "Liege-Hallen" method, the other rest combined with gradual and increasing exercise. The latter method I feel no doubt from personal experience is far the best. We owe it in its details in the first place to Brehmer, of Goerbersdorf, and then to Walther, of Nordrach, and it is the details of Walther's method, which I propose now to describe.

The Nordrach method of treatment consists of three simple remedies judiciously applied.

1. Abundance of fresh air at all times and in all weather.
2. Abundance of nourishing food, one might call it superabundance.
3. Rest and exercise graduated according to the state of the body temperature.

EXERCISE.

With rare exceptions no exercise is allowed in the Nordrach method unless the body temperature is within normal limits and has remained so for at least a week. The temperature is taken in the rectum regularly four times a day—on waking in the morning about 7 a.m., at noon, at 6 p.m., and after getting into bed at night about 9.30 p.m. In health the rectal temperature may vary between 98.6° F., or considerably below it in the morning, and attain to 100.4° F. after exercise or occasionally in the evening after meals. After violent exercise the temperature may rise to as much as 102° F. or even higher. There is no doubt that the rectal temperature gives a much nearer approximation to the real temperature of the blood than can be obtained in any other way, and in a prolonged insidious disease like consumption it is most important to know the smallest variations above the normal.

* Read before the South Midland Branch of the British Medical Association.

Many objections have been offered to taking the temperature in the rectum, most of them too trivial to discuss, but there is one that must be answered, and that is that it is unnecessary. It is urged by many that mouth temperatures give a sufficiently true indication of the range of the body temperature, and that even if it were best to know the rectal temperatures, these can be inferred by observing the ratio of difference between the mouth and rectal temperatures for a few days. It can easily be shown by experiment that both these statements are entirely wrong. In the first place, a patient may have active tuberculosis going on with definite slight pyrexia every day, and yet the mouth temperatures may give no indication of this at all. In the second place there is no definite ratio between mouth and rectal temperatures. This is no doubt due to the fact that the rectum is a closed cavity and the mouth is not. As a rule—though there are many exceptions even to this—the mouth and rectal temperature approximate fairly closely to one another after the night's rest, when the mouth has been closed in sleep, but during the day there may be a difference of as much as 1°, 1.5°, or even 2° F. Some times the mouth temperature will go down while the rectal temperature rises. In my own mind there can be no doubt whatever that rectal temperatures should be taken in all cases of tuberculosis which are being systematically observed and treated, and I believe this view is now accepted by the majority of the heads of sanatoria. If the temperature were taken for 15 to 20 minutes in the mouth a fairly accurate result might probably be obtained, but I think it will generally be found that a patient will prefer to spend 20 minutes a day with a thermometer in the rectum to an hour a day with a thermometer in the mouth.

Of the four temperature records taken in the day most importance is attached to that taken before rising in the morning. In the quiescent and obsolescing stage of pulmonary tuberculosis this is not only as low as 98.4° F., but generally very much lower, somewhere between 97° and 98° F. If the morning temperature remains persistently at 98.8° or 99°, or more, it nearly always means that the tuberculous disease is not quiescent, even though during the rest of the day the temperature does not rise above the normal limits. As far as my own experience goes, the chief exceptions to this rule seems to be in women, who often have slight elevations of temperature due to their monthly periods, and also in neurotic patients, who seem to be capable of raising their temperatures from 0.2° to 0.6° F. above normal by lying in bed and worrying over what it is going to be.

When the temperature has been shown by observation to be within normal limits, the patient is allowed to leave his bed. At first he only moves on to a couch, later he begins to take carefully graduated exercise broken by stated periods of rest. In the Nordrach method of treatment no form of exercise is allowed other than slow walking at about two miles an hour at the most, with frequent stoppages to sit down and rest. The walks, too, are best taken in hilly country with the chief ascent of the walk at the beginning, so that when the patients are tired they may come home down hill. It would appear that slow hill climbing up graduated paths is a very valuable form of exercise for consumptives. Without undue effort the muscles of the heart, and the body muscles generally, are strengthened, and the healthy portions of the lungs are expanded.

The length of the walk is exactly regulated by the physician according to the patient's strength and progress. The intention is that the patient should get sufficient exercise, stopping short of fatigue, and that the temperature after exercise should not be raised above 100.4° F. At Nordrach the chief walk of the day is taken in the morning between breakfast and dinner, and in the afternoon only a short walk, in which more time is spent in sitting about than in walking. The patients are all expected to lie down on their couches for an hour before dinner and supper. They all go to bed at 9 p.m. and get up about 7 a.m., so that even the most robust patients gets much rest every day, from nine to ten hours in bed, two hours on their couches, and much sitting about during their walks. The length of the walks allotted to the patients varies from a few yards to several miles, in some cases as much as six or seven.

No other form of exercise is permitted. Some advocate allowing early cases of phthisis to dance, play tennis, cricket, fives, row, and bicycle, but this advice is undoubtedly most harmful. During such active forms of exercise violent respiratory efforts are made, freshly-formed scar tissue in the lung is broken down, and tubercle bacilli which had been shut off by adhesion from the general lung tissue are

disseminated into parts of the lung hitherto healthy. These evil effects may possibly be shown at once by a rise of temperature and a fresh outburst of cough, but frequently untoward symptoms are delayed for two or three weeks until the bacilli have gained sufficient hold to give rise to constitutional disturbance.

The only way to estimate the effect of exercise on consumptives is by the systematic taking of rectal temperatures. If medical men would do this in cases of early phthisis they would soon see the evil results of excitement and violent exercise. As it is, when bad symptoms do ensue, perhaps some two or three weeks afterwards, they are attributed to some hypothetical chill, to anything, indeed, but the unwise exercise which they have themselves sanctioned.

FRESH AIR.

The fresh air is obtained in a perfectly simple manner, by having the bedroom windows of the patients wide open in all weathers, day and night, and also the windows of the sitting-rooms. At Nordrach there are no Liege-Hallen and very few of the bedrooms have balconies. The fresh air is obtained on the walks which are taken regardless of weather, winter and summer, and in the patient's own rooms. In Dr. Walther's opinion it is best that when the patients are resting they should be segregated and quiet, and not have the excitement of conversation and argument, which are so often inseparable from taking the air resting in large covered balconies.

DIET.

As regards the last point of importance, the nourishing and abundant diet, this at Nordrach is given in only three meals a day, and not in the frequent, small meals which some adopt.

Breakfast is at 8 a.m., and consists of large quantities of bread and butter with some cold meat, tea or coffee, and in many cases 0.5 litre of milk.

Dinner is at 1 p.m., and consists of three courses. The first, either fish or meat; the second, meat of either animal or bird; the third, fruit with biscuits, or cream ices or pudding of various kinds accompanied with coffee. With the first two courses are served large quantities of potatoes and other vegetables, and gravies and sauces containing much butter. In many cases also 0.25 or 0.5 litre of milk is taken.

Supper is at 7 p.m., and consists of two courses, the first of some hot meat with potatoes, the second usually of some cold meat with bread and butter, but occasionally a thick soup, pancakes, or cheese is given instead. Tea is allowed at this meal, and in many cases another 0.25 or 0.5 litre of milk.

With the exception of breakfast, at which the patients are allowed to help themselves, they are helped by the doctor in person, and are expected to finish everything that they are given on pain of dismissal from the sanatorium. I cannot make any exact statement as to the actual amount of food given at Nordrach. Dr. Kingston Fowler says, "the quantity of food, solids and liquids, prescribed to and eaten by each patient daily varies from 2 lb. 9 oz. to 5 lb. 5 oz., of this quantity 1 lb. 5 oz., to 1 lb. 8 oz. are solids." The amount was very considerable and sometimes seemed rather overwhelming, but it was not often much more than an active healthy man would have relished.

In managing a sanatorium myself I used to allow 4 oz. of butter a head a day, 3 pints of milk, and 2 lb. of uncooked meat, including bone and fat, or an equivalent in fish, poultry and game, and bread, potatoes, and other vegetables *ad libitum*. The open-air patients at the Northampton Infirmary are allowed 4 pints of milk a day, about 1 lb. of cooked meat, 4 oz. of butter, bread and potatoes *ad libitum*, and milk puddings. On this diet they make admirable gains in weight.

All patients, however, should not be given exactly the same amounts of food. The actual help should be to a certain extent individualized to the needs of each patient. The object to be borne in mind is not to make the patient enormously fat, but to make him moderately fat and thoroughly robust and muscular. It is one of the great merits of the Nordrach method of treatment that the patient is not converted into a flabby mass of fat, but into a robust and muscular specimen of humanity.

In the Liege-Hallen, or "rest-cure" method, patients often become enormously fat, breathless, and quite unfit for any exertion. It is not possible to give any table of weights that should be attained according to the patient's height. The proper weight depends not only on his height but on his breadth and depth, his general physique. The estimation of the proper weight must depend on the judgement of the physician. The point to be borne in mind is, I think, that

the patient should not only attain to the weight he was before his illness, but to very considerably over that weight, so that he may have reserved stores to fall back upon. As soon as the required weight is reached the milk is diminished and left off, and then the butter and potatoes are diminished, the object being to keep the patient in a state of equilibrium at a high level of nutrition.

If an endeavour is made to gain too much weight, the patient is apt to fall into a state of anorexia and vomiting. Some interesting experiments have been made on this matter by Drs. Bardswell, Goodbody, and Chapman. It would seem from their investigations that in many cases patients have been overfed, and that though they gain more weight and more rapidly on the very large diets, yet they do it at the expense of their general well-being.² It must not be inferred from these experiments that an abundant and nutritious diet is unnecessary. It is the duty of every medical man treating a consumptive case to use all his influence and, as far as possible, insist upon his patient eating large amounts of food, however much fever, anorexia, and vomiting there may be. It is the only way of breaking through the vicious circle of anorexia, dyspepsia, progressive emaciation, and weakness. These symptoms gradually disappear with increased nutrition, and it is wonderful how much weight may be gained, even with the most persistent vomiting. I had one very serious case in a patient who vomited once and very often twice a day for months, and yet during that time he gained 32½ lb., and finally lost his dyspeptic symptoms. A gain in weight, however, is not everything. With an abundant diet a patient may gain in weight without an improvement in the pulmonary condition. The converse, however, is very rarely true; if there is no gain in weight, there is very rarely any improvement.

The plan adopted at Nordrach of giving the food in three large meals a day is, I think, good. There is a prolonged rest between each meal both to the individual and the digestive organs, and this I think is better than constantly worrying the stomach with little snacks. Further, each meal is taken after a bodily rest in bed or on a couch, and this is also important.

DRUGS.

As regards drugs, the patient must be treated on general principles. Cod-liver oil is not necessary with this abundant food; night sweats generally disappear rapidly with the full adoption of the open-air life, but a course of zinc oxide and belladonna in pill may be necessary; digestive adjuvants may be advisable, such as bismuth and soda, or gentian, soda, and nux vomica; cough sedatives may be necessary, and so on, but, speaking generally, the less drugs the patients have the better.

THE DAILY ROUTINE.

The daily life of an afebrile patient treated on the Nordrach system, then, is briefly somewhat as follows:

He gets up soon after 7 a.m., and about 8 is visited by the doctor, who inspects his temperature chart and apportions him his morning walk. At 8 he breakfasts, and somewhere between 8 and 9 starts out on his morning walk, which lasts till between 11.30 and 12, no matter whether there is frost or snow, or rain or fog. By noon he returns to his room, takes his temperature, and lies down on his couch for one hour, until dinner, at 1 p.m. Before dinner the doctor visits him again, inspects his temperature chart and apportions his afternoon walk. After dinner, and a good deal of sitting about and conversation, he starts on his short afternoon walk: any time between 4.30 and 6 p.m. he comes back to his room, takes his temperature again and lies down for an hour, before supper at 7 p.m., and the doctor pays him another visit. After supper the day's duties are at an end, and after conversation, and perhaps some music, the patient goes to bed about 9 p.m. Each day is a repetition of the preceding one, and the life may seem very monotonous, but in fine weather, in beautiful country, and with pleasant companions and books, the time passes happily enough. Quiet and absence of excitement are an essential part of the treatment. The gaieties of Davos are a most unfortunate and pernicious snare for consumptives. Pyrexial patients lead a still quieter life, entirely confined to their rooms and their beds.

COMMENTS ON THE NORDRACH SYSTEM.

I do not think it is necessary to send out patients to sit for hours in the woods in the worst weather. It is perfectly true that they never seem to get colds, even if they get thoroughly wet, but, judging from my own experience, they certainly often

feel miserable, and may suffer severely from rheumatism as I did. I think large open sheds should be provided, where they may be thoroughly out of doors and yet dry while they are sitting down.

I think again small balconies or shelters for a few patients together should be provided, so that patients who have lost their fever and are yet not strong enough to walk, may, during the walking hours be able to repose in company, and have the mild stimulus of a little conversation and society.

I think lastly that the diet should to a certain extent be modified for patients with great digestive disturbance. At Nordrach the food—much of which is indigestible—is given to all alike. It is essential, it is true, that patients should be made to eat whether they wish to or not, and should not be permitted to be fanciful and refuse what is set before them, but the doctor should exercise a wise discretion in dieting his worst patients. I made these small alterations while I was conducting a sanatorium in Ireland, and I do not think they in any way militated against the beneficial results of the treatment, while they certainly made for the comfort of the patients.

RESULTS.

As far as I know the results obtained at Nordrach have never been published, but it only takes a little observation to see that they are very good, and it is really due to the results there obtained that the idea has taken shape, that probably with the same system equally good results might be obtained in the climate of the British Isles. The reason of this is that the climate of the Black Forest is much like the climate of the British Isles. It is not that High Alpine air and abundance of sunshine is not valuable; they are, and possibly the best results of all are obtained in high altitudes or in Arctic cold, but I think I shall be able to show by statistics that the results obtained at low levels and in our own climate are only little inferior, which proves that the main point in all cases is an abundance of pure fresh air.

Some of the following statistics have been published before; some others I have obtained through the kindness of the managers of certain British sanatoria, namely, Dr. Jane Walker and Miss Chesney, of the East Anglian Sanatorium; Dr. Thurnam, of Nordrach-upon-Mendip; and Dr. Burton-Fanning and Dr. W. J. Fanning, who have until recently managed the Mundesley Sanatorium. I have not added the different results obtained at the English sanatoria together to produce a grand total, because, owing to the difference in terminology, it is impossible to exactly correlate them.

THE RESULTS OF DR. THURNAM.

The results of Dr. Thurnam, of Nordrach-upon-Mendip, for the first two years of his sanatorium, are as follows. He uses the following terminology:—

Absolute cure means no fever, no tubercle bacilli in the expectoration; lung signs very much diminished, and fitness for locomotion great; able to return to work, and, after a year's caution, to live like ordinary men.

Relative cure means no fever; much fewer tubercle bacilli in the expectoration; much diminished lung signs, and fitness to return to work with caution. The tendency is to get quite well after a year or so.

Amelioration means improvement, but the patient is unable to return to work or life as he used to live it, and has to carry on treatment strictly at home.

Absolute cure ... 24 % } = cured 45 %, and improved 82 %
Relative cure ... 21 % }
Ameliorated ... 37 % }
Not improved ... 18 % }

THE RESULTS OF DR. JANE WALKER AND MISS CHESNEY.

Dr. Jane Walker and Miss Chesney send me the following results and interesting remarks in answer to certain questions:—

- I. *Cheshunt's Sanatorium*, from May, 1899, to March, 1900.
Total cases ... 58
Recovered ... 9, or 15 1/2 % about } = total improved nearly 57 %
Improved ... 24, or 41 1/2 % }
Going back ... 1, or 1 1/2 % }
Died ... 15, or 26 % }
Under treatment ... 9
- II. *Brookside Sanatorium*, October, 1899, to June, 1900.
Total cases ... 31.
Recoveries ... 8, or 25 % about } = total improved, 75 % about.
Improved ... 16, or 50 % }
Gone back ... 6, or 20 % }
Died ... 1, or 3 % }
- III. *Poor patients*, men and women, February, 1900, to present date. Total, 100 cases.
15 under treatment still.
62 left much benefited.
4 became so ill they had to be removed, and died immediately after leaving.
16 no improvement.
3 stayed a very short time.
Of the 85 patients who have left—
10 have died.
18 are still going on well.
15 were better when last heard of.
43 have not been heard of.

General Remarks.—The earlier cases are taken under treatment the

better they do. The less nervous and highly strung the patients are the better they do. The younger the patients are as a rule the longer they take before the disease is arrested. Poor patients are most apt to go back after treatment, as of course they have to return to bad surroundings, insufficient food, and hard work. Bronchitis and asthma are complications which make the treatment of phthisis in England difficult during the spring months, but, even with these drawbacks, Miss Walker considers that patients do quite as well under the open-air treatment in England as they do in foreign sanatoria.

THE RESULTS OF DR. BURTON-FANNING AND DR. W. J. FANNING.

Dr. Burton-Fanning and Dr. W. J. Fanning, who have until recently managed the Mundesley Sanatorium, have sent me the following results and remarks:—

"Arrest" = total disappearance of fever and fitness to work restored.

Arrests ... 55 95 % } = total improved 83.92 %
Improved ... 27.97 % }
No improvement ... 6.29 % }
Worse or died in sanatorium ... 9.79 % }

Arrest maintained in 86.25 per cent. of arrested cases. Improvement maintained or increased in 49 per cent., in which improvement could be recorded on discharge. Percentage of deaths on admission, including those who died in the sanatorium and those whose deaths we have heard of after they left, amount to 22.31 per cent. in three years.

In 1901, at the Tuberculosis Congress, Dr. Burton-Fanning summarized the results obtained at British Sanatoria as follows (*Tub. Transactions*, vol. iii):

716 patients have been treated.
Average duration of stay, 4 months.
Quiescence or relative recovery ... 37.4 % } = improved 77.6 %
Amelioration ... 40.2 % }
No amelioration ... 22.3 % }

History of patients only covers two years or less; but, so far, all patients with quiescence have remained well; and of the ameliorated all but 8.9 per cent. have maintained their improvement. In selected early cases 88.4 per cent. of quiescence was obtained.

Compare with these English results Dr. Theodore Williams's table of his cases treated in the High Alps:—(*Tub. Transactions*, vol. iii.)

Cases.	Absolute Rest.	Diminished Physical Sign.	Improved Total.	Stationary.	Worse.
	174	129	303	20	59
385	or	or	or	or	or
	45 %	33.5 %	79 %	5.2 %	15 %

And Dr. Turban's results obtained by sanatorium treatment at Davos:—

Patients.		Lasting Results.	
Stage I	97	80.4 %	
Stage II	205	48.8 %	
Stage III	106	17.0 %	
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He also gives the following table as giving probably the truest summary:

Patients.		Lasting Results.	
Stage I	97	80.4 %	
Stage II	205	48.8 %	
Stage III	106	17.0 %	

The difference between this and the foregoing table is due to losing sight of patients, which happens mostly in the first stage.

The difference in terminology in all these tables of results is unfortunate, as it renders an exact comparison between them impossible. There is possibly a very slight balance in favour of High Alpine resorts, but if the relative and absolute cures obtained by Dr. Thurnam be added to gether they come to 45 per cent., the exact number of absolute arrests in Dr. Theodore Williams's statistics. It must always be remembered that the results obtained at a sanatorium depend not only on the proper carrying-out of the treatment, but also on the classes of cases admitted. In England we are making up arrears, and taking in for treatment advanced cases.

CONCLUSIONS.

These statistics, I venture to think, point very clearly to certain definite conclusions of great importance to all of us as practitioners.

1. Of paramount importance to our patients is our absolute duty as practitioners so to cultivate our powers of observation and skill in diagnosis that we are capable of recognizing the earliest signs of pulmonary tuberculosis. Dr. Burton-Fanning's statistics from British sanatoria, show that in selected early cases, quiescence was obtained in 88.4 per cent., whereas in cases of all degrees of severity quiescence was only obtained in 37.4 per cent., a difference of 51 per cent.

2. As soon as we have made our diagnosis of pulmonary tuberculosis, it is our duty at once to put our patient on the most thorough open-air treatment that his circumstances will allow. Let there be no half-hearted measures. No windows a little open in the day and just a crack open behind blinds and curtains at night. No little meals sent away half eaten; no going away for change of air, which merely means a change from one stuffy room to another and from one set of injudicious friends to another set still more injudicious. If your

patient is poor, if possible send him away to an open-air sanatorium; if that is not possible do your best for him at home with windows wide open day and night in all weathers, with a deck chair in the garden or under a shed and with a nourishing and abundant diet, which must be eaten. I have known wonders done with no better means. If your patient is not poor then I believe your duty is still much the same. The patient should if possible be sent off to a sanatorium at the earliest opportunity. If the patient is only moderately well off, then I believe the best plan is certainly to select a sanatorium in our own islands. Such patients will in after life have to work winter and summer in our own uncertain climate, and far their best chance of permanent recovery is to go through the treatment in the climate in which they will have permanently to live. If, however, the patient is rich, the question may arise as to whether he should be sent abroad. With our short experience of the treatment in the British Isles there is possibly a slight balance in favour of the results obtained at High Alpine resorts such as Davos, so, if the patient is rich and in other respects a suitable case for high altitude treatment, it may be well to send him to Davos or some other Alpine resort. Let it be understood, however, that a patient sent to an Alpine resort should be sent to a sanatorium, unless he is exceptionally self-controlled. I have seen too much of patients who have spent winter after winter in Davos at hotels. Their time is spent in a round of the most pernicious gaieties, in dancing and concerts, in tobogganing and skating. They do everything they ought not to do, and finally, despite the splendid air, come away no better than they came, or haply worse, sometimes to die, sometimes to the opprobrium of Davos, to be cured readily at a low-lying sanatorium.

3. It is essential that even in the slightest case, a very long period should be devoted to treatment and rest from work. Every one who has studied the pathology of pulmonary tuberculosis is aware that many tubercle bacilli are left in the lungs, shut off by adhesions and fibrosis even after apparent cure. If possible the patient should spend many months at a sanatorium, but even one or two months will be useful as a training. After leaving the sanatorium, if counsels of perfection can be followed, the patient should live a modified open-air life for one and a-half to two years. With the poor this is a very serious difficulty. One must do the best one can by inducing them if possible to take up some light outdoor occupation.

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SANATORIA PLUS HOMES FOR CONSUMPTION.

By W. RUSHTON PARKER, M.A., M.D. CANTAB.

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THREE years' experience at the Westmorland Consumption Sanatorium shows that consumptives admitted in the advanced stage (with cavitation or extensive consolidation, often with considerable fever, and with abundance of bacilli in the sputum) gain very little permanent benefit from six months' residence, and usually die within a year of their discharge. Those admitted in the earliest stage (with no evident consolidation, very little fever, and bacilli rarely found in the sputum) by three months' residence regain their ability to earn a living for many years. Those admitted in the intermediate stage (with limited consolidation) are by four and a-half months' residence considerably benefited for some years, though a few soon relapse and die.

It appears, therefore, that if all consumptives could be treated in sanatoria for three months during the earliest stage of their disease, and taught how to preserve the health there regained, very few would reach the advanced stage, so dangerous to the general community, and thus a great public benefit would be gained. Under such circumstances sanatoria might well be erected and maintained out of the rates for the general good.

But three years' experience also shows the great difficulty of securing the admission of even a majority of cases in the earliest stage; a large number reach the intermediate stage, and very many even the advanced stage, before coming under observation. Although as each year passes by a smaller proportion suffer this fatal neglect, probably for many years to come a large number of consumptives will first come under observation in the advanced and practically hopeless stage.

It seems obvious, therefore, that we shall need all over the kingdom not only sanatoria for the arrest of the disease in its early stage, but also homes for the isolation of advanced cases from the rest of the community.

In any district where the adoption of only one of these plans is proposed, help should be forthcoming from rating bodies, for example, county councils, town councils, urban and rural district councils, and Boards of Guardians, on the ground that either plan benefits the community by protecting it from persons suffering from the disease in a dangerously communicable form—sanatoria effecting this by arresting the disease in a comparatively harmless stage, while homes effect it by isolating cases which have already reached the dangerously communicable type.

But in any district where the adoption of both plans is contemplated, rating bodies should support homes for advanced cases in preference to sanatoria for early cases, on the ground that the community benefits more obviously and immediately by the isolation of those dangerously infective than by the problematical arrest of the disease in its early stage. Indeed, some may argue that the mere arrest of the disease in its early stage, as distinct from a real and permanent cure, is of no benefit to the general public. Our aim, therefore, should be for homes supported out of the rates, and sanatoria supported by the individual.

As two-thirds (or, strictly, 70 per cent.) of any population usually belongs to the working-class, and as during the last ten years there have been about 42,000 deaths annually from consumption in England and Wales, we may assume that 28,000 persons will annually qualify for admission into such homes. At those which already exist (for example, Firs Home, Bournemouth; Mildmay Home, Torquay; St. Catherine's Home, Ventnor; St. Michael's Home, Axbridge; Gloucester Place Home, London) the applications for admission far exceed the vacancies; the duration of stay is about six months; and the annual cost of maintenance is about £65 per bed. We may assume, therefore, that we shall require 14,000 beds, at an annual cost of £1,000,000 a year. About one-sixth of the cases would be paupers; so that one-sixth of the cost would be chargeable to the guardians. As it has been calculated that one eleventh of all the pauperism of the country, costing in England and Wales £11,500,000 a year (1900-1901), arises from consumption, the million pounds a year proposed to be so spent should produce much more profitable results than the million pounds a year already spent in merely relieving the pauperism caused by neglected consumption.

In every population of 100,000, about 120 die annually of consumption, of whom 80 require accommodation in a home of 40 beds, at a cost of £2,800 a year, roughly equivalent to a penny rate for such population.

Were such a system generally adopted, the spread of consumption should be very greatly checked, while other preventive measures were being gradually undertaken—for example, better housing, ventilation of factories and workshops, creation of open spaces in crowded towns, etc., so that, in time, the disease should be gradually exterminated.

In Westmorland the Consumption Sanatorium has had the good fortune to be liberally supported by the county council, by nearly all the town councils, urban district councils and rural district councils, and by all the Boards of Guardians, so that the withdrawal of this support would be a serious loss to the institution. Nevertheless, as a home for advanced cases is now proposed, it seems inevitable that all the above bodies may consider it incumbent upon them to transfer their help to the new institution.

THE Flannel Shirt Club, which is in the seventh year of its existence, undertakes to distribute, with the co-operation of hospital sisters and nurses, flannel underclothing to necessitous working men on their discharge from medical wards in the general hospitals of London. The need for such assistance, as all who have worked among hospital patients well know, is often as urgent as the need for medical treatment or for food. During the past year 369 shirts were provided by this Society. Gifts of flannel, of which about four yards are required for each shirt, the making of which costs about 1s. 6d., or of men's flannel shirts, made to close well over in front, will be gladly received by the Honorary Secretary, Miss Gethen, Stanley House, Bow Road. Working members of the club subscribe 1s. annually, and undertake to provide at least one flannel shirt each year. Honorary members subscribe 2s. 6d., and undertake to provide two shirts.