free of pus during the attack, because all he would void would come from the unobstructed right ureter. The diagnosis was pleurisy at one time. The kidney and sac were removed, as they were worse than useless. In a case in which the kidney seemed worth saving, a plastic operation to remove obstruction would be indicated.

Case II, Pte. C., aged 22 years, had complained for only one week of undue frequency of urination with urgency almost to incontinence, night and day, and a burning sensation down the urethra for a few moments after voiding. He was suffering from a dental abscess as well, and after this was lanced the urinary symptoms diminished. The urine contained pus and staphylococci. On cystoscopy the mucous membrane of the right ureter was prolapsed, resembling a small pink oblong balloon, at one time tense and globular, at another partially collapsing, somewhat suggestive of the movement of a slug. Fig. 2 illustrates the condition.

FIG. 2.

The hydraulic pressure in the ureter required to force urine through the small orifice had bulged the lining of the ureter into the bladder, carrying with it the ureteral meatus, had coincidentally dilated the ureter itself and the renal pelvis, and had caused atrophy of the medulla of the kidney and gradually stretched the renal capsule. As a symptom of this condition a woman patient of mine with prolapsed ureter had pain over the kidney, but she was older, had borne children, and the colon bacillus had got a foothold. The pain ceased after a ureteral meatotomy was done through a cystoscope. In Case II one is inclined to think that the prolapsed ureter with dilatation was present without symptoms until the dental abscess freed staphylococci into the blood stream, and then the handicapped kidney and ureter were invaded. The ureteral orifice became smaller with congestion, more prolapse occurred, and the acute condition gave rise to symptoms.

The meatus of the ureter was split up after a preliminary suprapubic cystotomy.

Case III, Pte. C., aged 22, had a dilated double ureter entering a diverticulum of the bladder. This diverticulum when contracting to force out its contents caused regurgitation up the ureter. The symptoms and signs were interpreted with difficulty. The appendix was removed six months ago. There were no urinary symptoms at that time except slight increased frequency of urination. The appendix was found acutely inflamed and adherent to the caecum.

Since then pain over the right kidney had developed, frequency of urination had increased, and to it was added an after-dribble. Another prominent symptom was pain about McBurney's point, and there was tenderness here and in the right costo-vertebral angle. The urine was normal on four examinations, especially made for surgical purposes. Cystoscopy showed, in an otherwise normal bladder, a hole which, on filling the bladder tense with boric solution, was 1 cm. across and 3 cm. deep on measurement. This hole was located at the site of the right ureteric orifice and became much smaller as the urine in the bladder was drawn off. After filling the hole with 40 per cent. argyrol solution x-ray examination showed a pouch at the base of the bladder about 2 in. in

diameter around which coursed a dilated double ureter. Captain St. John has sketched this for me in Fig. 3.

FIG. 3.

The diverticulum was removed and the double ureter was transplanted elsewhere in the bladder. The amount of relief obtained will depend on the degree of renal pelvic distortion already produced by back pressure. There is no pain now, but he has had no violent exercise since operation about three weeks ago.

A SANATORIUM ROLL OF HONOUR.

BY

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THE place of the sanatorium in a scheme for the administrative control of pulmonary tuberculosis has been the subject of considerable discussion recently. From communications to this JOURNAL and its contemporaries, and from reports of Insurance Committees one has learnt that among experienced observers widely different opinions are held. To the evidence which has been brought forward in favour of or opposed to the value of sanatorium treatment I offer this contribution, which represents the record of war service, so far as it has been ascertained, of patients at the King Edward VII Sanatorium. For an individual with arrested disease to undertake life under active service conditions, especially with the overseas troops, is to submit himself to an exacting test as to the permanence of the benefit he has received—in other words, as to the durability of the arrest of pulmonary tuberculosis following a course of treatment in the sanatorium.

It is well, when dealing with the careers of cases of pulmonary tuberculosis, to consider separately those in which tubercle bacilli were and were not found in the sputum. It is impossible here to summarize for the latter group the evidence upon which the diagnosis was determined. These cases have to be taken on trust. On the other hand, with the record of a positive sputum the diagnosis is beyond question.

Of the patients who, on admission to the sanatorium, had tubercle bacilli in the sputum, 61 are known to have served with the forces. They were discharged from the sanatorium during the years 1907 to 1915 inclusive. Thus, in respect of many of them, the improvement resulting from sanatorium treatment has been submitted to a test of durability represented by several years of full and active work in civil life followed by a period, averaging in these 61 cases some eighteen months, under active service conditions; 24 have served in France, in several instances after some months in Gallipoli and Egypt, their length of service varying from a minimum of nine months to over two years. Three patients went to Egypt, 3 to Salonica, 1 to a staff post in the West Indies, 2 to East Africa, 2 to Gallipoli, 4 joined the navy, 2 are serving in the Flying Corps, and the remaining 20 are either on home service or are still training in this country. The experience of this group of patients down to May, 1917, is as follows:

- 44 are in good health, and still serving with the various forces they engaged in;
- 5 have been killed in action, and
- 12 having relapsed, have been invalided out of the service.

The highest proportion of relapses has occurred amongst the men on home service, namely, 5 out of 20. Of the 24 who went to France, where the conditions are certainly more arduous, 4 only have relapsed; of these, 1 had served throughout the Gallipoli campaign, and subsequently in Egypt, before his transfer in mid-winter from the latter country to France. In brief, of these 61 former patients, 49, or 80 per cent., successfully withstood the wear and tear of active military duty.

Of the patients in whose sputum tubercle bacilli were not demonstrated, 33 are known to have joined the forces, their proportionate distribution in the various spheres of the war being closely similar to that of the patients just considered. Their experience also has been closely comparable; 26 are in good health and still serving, 2 have been killed in action, and 5 have relapsed: 3 broke down in France, 1 at Gallipoli and 1 at home. Thus 28 of the 33, or 84 per cent., have suffered no recurrence of pulmonary tuberculosis.

The results in both groups of patients are far from unsatisfactory; they are much that would be expected by those with any considerable experience of sanatorium treatment. To practitioners, such as a recent correspondent to this JOURNAL,¹ who have yet to learn of an authentic instance of permanent arrest of pulmonary tuberculosis as the result of treatment in a sanatorium, this record may be commended.

It is essential to add that the patients treated at the King Edward VII Sanatorium are drawn from the middle classes. Though not necessitous, they are dependent upon their own exertions for a livelihood. While, on the one hand, they cannot command the advantages enjoyed by the leisured classes in the way of prolonged treatment under the best possible circumstances, at least they enjoy social conditions infinitely more favourable than those of the great majority of the industrial classes. Herein lies the crux of the question of the value of sanatoriums. It would seem not to be generally recognized that treatment in a sanatorium is to be looked upon less as a cure for pulmonary tuberculosis than as a means of teaching the consumptive how he may hope to arrest his disease and how to prevent his spreading infection, at the same time giving him a good start on the road to recovery. To achieve permanent recovery, one must look to the patient embodying in his daily life after discharge from the sanatorium the principles of the treatment he has learnt. It is during the next twelve or eighteen months that success or failure is determined; the better the facilities for living and working under favourable conditions the more hopeful the outlook. The extreme importance of this social factor has been well shown by Elderton and Perry in one of their statistical studies of pulmonary tuberculosis.² They compared the mortality experienced by a number of cases of pulmonary tuberculosis during a period of some years subsequent to their discharge from several sanatoriums; considering separately those discharged from institutions for the industrial classes, and those from similar institutions for the wealthier classes. The comparison shows that in cases of early disease (Group 1) the post-discharge mortality is twice as high among the industrial classes as among the more leisured classes, and that in cases of moderately advanced disease (Group 2) it is more than three times as high. This result is striking and illuminating.

Treatment in a sanatorium is, in fact, of value in proportion to the degree of after-care that can follow it. To obtain anything like comparable ultimate results at sanatoriums for the industrial classes and sanatoriums for patients in better circumstances, there must be a levelling up of the conditions after discharge. Various suggestions have been made, such as country colonies, financial assistance after discharge allowing a consumptive to work for shorter hours or to take up a more suitable occupation which, for a time at least, must be less remunerative, and a better organized system of after-care. The following recommendation in the recent published report upon the incidence of pulmonary tuberculosis among workers in the boot and shoe industry indicates another line upon which much improvement might be effected.

Briefly, the scheme is to establish, in connexion with the ordinary form of sanatorium, a workplace for the manufacture of boots and shoes. Here consumptive operatives in an early

stage of the disease, and convalescing patients, could carry on their trade under medical supervision for such hours as they are able, and earn wages in proportion.³

Conclusion.

I should perhaps add that in my opinion this record of war service, encouraging as it is, does not warrant the assumption that the former consumptive may undertake military duty with some degree of confidence. On the contrary, such a course strikes me as tempting Providence unduly. At the same time it would seem that it is possible to err on the side of caution. Clearly, every case of apparent cure must be judged on its own merits in respect of fitness for military duty. The extent of the original lesion and the length of period of complete immunity from all signs and symptoms of the disease are factors which help us in arriving at a decision.

Addendum.

The day after this paper was written the BRITISH MEDICAL JOURNAL issue for April 14th appeared, containing a leading article entitled, "The Uses and Abuses of Sanatorium Treatment," an interesting commentary upon the statistics of ultimate results published in the tenth annual report of King Edward VII Sanatorium. With the inferences drawn from the statistics by the writer of this article I am in full agreement. That a sanatorium is essentially for the treatment of early and curable cases, and that to fill such an institution with patients in the advanced and hopeless stages to the exclusion of the more favourable represents a most unwise and extravagant procedure, all will agree. But is it the fact that the favourable cases are thus excluded; and, if so, with whom lies the blame? So far as the Midhurst Sanatorium is concerned, I can answer the first question with some confidence, for since the opening of the institution in 1906 the selection of patients for admission has been one of my duties. The principle strictly adhered to from the commencement has been to admit the clinically most favourable among the applicants. Our experience at Midhurst is that of an average annual admission of some 240 patients carefully selected from the total number of applicants, only 25 per cent. are early cases (Group 1) as defined by the recognized methods of classification of pulmonary tuberculosis.

These cases are sufficient to fill approximately a quarter of the available beds. There is no alternative, then, but to fill the remaining 75 per cent. of the beds with the most favourable among the other applicants. Thus it is that the bulk of these beds are occupied by cases of moderately advanced disease (Group 2), and the remainder, for lack of any more favourable, with cases of much advanced disease (Group 3). The same conditions, but to a more marked degree, would seem to apply in sanatoriums for the working classes. The records at Midhurst, year by year, show little improvement in this respect. During the five years 1906 to 1910, 1,208 patients were admitted, of whom 25 per cent. were cases of early disease. During the following five years 1,112 patients were admitted, the percentage of early cases being practically identical. The only improvement shown in the second period was a diminution in the proportion of the advanced cases. The sanatorium asks for the more hopeful cases, but can obtain them only to a limited extent. It must be either that the cases of early disease do not exist in sufficient numbers fully to occupy existing sanatorium accommodation, or that such cases are not recognized and sent. The latter alternative is the more probable. Some cases, unquestionably, are never early—the disease, as soon as its discovery is possible, has already obtained a wide hold. But to judge from the histories given by patients on admission, the great majority of the more advanced cases could have been detected and treated months earlier, when the conditions were infinitely more favourable for arrest of the disease. The histories of patients admitted to the Midhurst Sanatorium show how frequently the earlier manifestations of consumption are overlooked alike by the public and the medical profession.

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