MANAGEMENT OF PULMONARY DISEASE IN THE FORCES

BY

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It is somewhat peculiar that the subject of pulmonary disease other than tuberculosis in members of H.M. Forces has not received more attention. The main purpose of the clinical sections of the Army Medical Services must be to return the sick soldier to health and duty in as short a time as possible. Such diseases as tuberculosis and peptic ulcer, and many cases of effort syndrome, although of great clinical interest and much written about, must eventually render the soldiers so affected unfit for further military service or at best fit for service in only a limited capacity. The acute non-tuberculous pulmonary affections, however, should be capable of complete cure in a large proportion of cases, and even the chronic varieties, if properly managed, should not be incompatible with a high degree of functional efficiency. Furthermore, with the exception of the dyspepsias, pulmonary diseases form the largest group admitted to the medical wards. This group is therefore of considerable importance to all who have to deal with sick soldiers, whether it be in the form of diagnosis, treatment, or the management of convalescence, the last especially being more complex in the Services than among civilians.

The experience of one military hospital in dealing with pulmonary disease over a period of 12 months (Oct., 1940, to Oct., 1941) may be of some interest. During this period 329 patients with respiratory disease were admitted to and discharged from the medical wards, exclusive of cases complicating or occurring in the course of surgical treatment. Table I summarizes the

diseases in a hospital is not, of course, a true reflection of their actual incidence in the Army: many cases of upper respiratory infection and acute bronchitis are successfully treated in smaller medical units; many chronic bronchitics and asthmatics do not and should not require hospital treatment. On the other hand, patients suffering from pneumonia should all be transferred to hospitals where trained nursing care, so important in such cases, is available. The incidence of pulmonary tuberculosis will appear high in this series because this hospital acts as a clearing-house for such cases over a wide area, many patients being transferred here from E.M.S. hospitals, etc., before discharge to civil sanatoria. It is proposed, for purposes of discussion, to divide this series into groups, in which the diseases have some clinical, pathological, or therapeutic relation, and to concentrate on aspects especially important to the Service M.O.

Upper Respiratory Infections, Acute Bronchitis, Chronic Bronchitis, and Bronchiectasis

Upper respiratory infections (viz., common cold, laryngitis, tracheitis, etc.) and acute bronchitis are bacteriologically and pathologically different stages of the same disease. The clinical distinction is important because it is seen from Table I that acute bronchitis, as would be expected, necessitates a considerably longer stay in hospital. Furthermore, when abnormal physical signs appear in the lungs convalescence must be more carefully controlled if chronic bronchitis is to be avoided: thus patients with upper respiratory infections were usually fit to return to duty from hospital, whereas acute bronchitis entailed convalescence in B.R.C.S. hospitals or convalescent depots. It should rarely be necessary for a soldier to be off duty longer than 30 days because of acute bronchitis, and often a shorter period will suffice. In the case of a first attack of acute bronchitis the previously fit man should not, however, be returned to duty until his lungs are quite free from abnormal physical signs. If convalescence should be delayed the possibility of complication by a more serious disease should be remembered and special investigation be undertaken.

Chronic bronchitis in the Army, as in civil life, is not uncommon among older men (over 35), and I have been surprised by the frequency with which even men in their twenties have been found to suffer from this disease, often the result of repeated attacks of winter bronchitis which has been neglected. The chronic bronchitic is, of course, more likely to report sick in the winter than in the summer, and may require a short stay in hospital from time to time. Usually, however, the chronic bronchitic does not need or benefit by hospital treatment, and the great majority (Table I) are fit for duty, sometimes of a quite arduous nature; in fact, Army life is often good treatment for such patients, with its adequate food, open-air life, and well-regulated activities, and they are frequently better off in the Army than in civil life as road labourers, miners, builders, labourers, shipyard workers, etc. Causes of real incapacity indicating discharge are emphysema, cardiac insufficiency, and associated disease—e.g., arteriosclerosis, chronic alcoholism, obesity, chronic nephritis, etc. The one death in this series was that of a man of 45 with marked emphysema and cardiac failure who should not have been enlisted 5 months previously.

Bronchiectasis is an indication for discharge if it conforms to the classical description, with fetid sputum, etc.; but the greater frequency of lipiodol investigation is revealing more mild cases of bronchiectasis: such cases are fit for useful military service in the lower medical categories. There were 4 of these mild cases out of the 8 in this series (Table I).

TABLE I.—Summary of Respiratory Diseases in 12 Months in Military Hospital

Type of Disease	No. of Cases	Aver. Age (Yrs.)	Aver. Service (Yrs.)	Aver. Dur. in Hosp. (Days)	R.T.U.	Cat. E	Died
Upper respiratory infections	44	28	1 11/12	9	44	0	0
Acute bronchitis	38	30	2 9/12	16	38	0	0
Chronic bronchitis	23	36	2 11/12	16	17	5	1
Bronchiectasis	8	28	2 11/12	22	4	4	0
Lobar pneumonia	41	26	2 1/12	26	40	1*	0
Pneumonitis	12	27	1 1/12	26	12	0	0
Bronchopneumonia	8	40	8 3/12	43	5	2	1
Atypical pneumonia	2	33	3 3/12	67	1	0	1
Lung abscess	2	24	1 3/12	54	1	1*	0
Chronic phthisis	64	31	2 2/12	N.S.	0	61	3
Arrested phthisis	4	26	9/12	N.S.	0	4	0
Primary tuberculous complex	1	30	4/12	46	1	0	0
Tubercle bacilli carrier	1	30	8/12	N.S.	1	0	0
Pleurisy with effusion	25	25	1 4/12	N.S.	4	21	0
Sulphapyridine effusion	3	22	1 4/12	46	3	0	0
Pulmonary fibrosis	30	31	4 5/12	25	26	4	0
Silicosis	3	38	10/12	16	0	3	0
Bronchial asthma	10	27	2 8/12	18	9	1	0
Carcinoma of lung	4	49	1 8/12	N.S.	0	2	2
Mediastinal lymphosarcoma	1	26	6/12	N.S.	0	0	1
Spontaneous pneumothorax	3	35	1 2/12	25	3	0	0
Bronchial haemangioma	1	41	27	63	0	1	0
Congenital cystic disease	1	30	1 1/12	25	1	0	0
Total	329	100%			210	110	9
					63.9%	33.4%	2.7%

* Discharged on account of duodenal ulcer.
N.S. = Duration in hospital not of clinical significance.

numbers, average ages, length of service, duration in hospital, and disposal of such patients. The incidence of the various

Lobar Pneumonia, Pneumonitis, Bronchopneumonia, and Atypical Pneumonia

This group differs from the previous one in that the diseases in the latter can normally be successfully treated in small medical units, whereas those now under discussion often require the technical facilities of a hospital for their precise diagnosis and treatment, and patients so affected should always receive the inestimable advantage of *trained nursing*.

Lobar Pneumonia

The present series included 41 cases of typical lobar pneumonia (Table I). All had unequivocal physical signs, and x-ray confirmation was obtained in many; rusty sputum and herpes frequently lent additional evidence. There were no deaths in this series, and one patient was discharged from the Army on account of duodenal ulcer of long standing, having recovered from his pneumonia. X-ray evidence of complete resolution was obtained in each case before final return to duty was advised. Comparison of mortality rates in the many series published is not possible, as various factors are involved—e.g., age incidence, day of disease on admission, type of pneumococcus, associated disease, etc.—and the same applies to the incidence of complications. One of the lowest mortality figures recorded was Gaisford's (1940) series, in which 8 (1.4%) died out of 569 patients under 50 years old. All my patients were under 50 years, and, as would be expected, the incidence of associated disease was very low; furthermore, the sick soldier reaches hospital at an earlier stage of his illness than his civil counterpart. Even so, 41 complete recoveries in 41 lobar pneumonias represents a great advance on results possible in pre-chemotherapy days. Gaisford's mortality figures for similar groups of cases in the two years preceding the use of sulphapyridine were 13.6% and 15.5% respectively. Although the sputum was often cultured in my series, typing was not possible. The frequency with which the different lung lobes were involved was: right lower, 20 cases; right middle, 1; right upper, 1; left lower, 16; two lobes (one lung), 2; two lungs, 1.

Sulphapyridine was given to 36 of the 41 patients; the other 5, admitted late in the disease, were obviously going to recover spontaneously. Fluids and glucose by mouth were pushed, and oxygen by B.L.B. mask and sedatives were used when necessary. Cardiac stimulants and poultices were not employed. Morphine in doses of 1/6 to 1/4 grain was used for pain, and was found very satisfactory; it was often given on the first two nights in hospital in the absence of cyanosis. Alcohol was not used, although its value in older patients and chronic alcoholics is recognized. The only dietary restrictions were those indicated by the patient's condition. The dosage of sulphapyridine and methods of administration vary greatly in different published series—e.g., approximately 15 gm. in 3.5 days (Gaisford, 1940); 17.5 gm. in 4.5 days (Smith, Riley, and Jones, 1940); 50 gm. in 10 to 11 days (Snodgrass and Markson, 1941); 49 gm. in 6 to 8 days (Anderson and Cairns, 1940). In the present series the dosage was based on the following principles: the blood level was raised rapidly by heavy early dosage, including two "loading" doses; the blood level was maintained at a regular figure by administration at four-hourly intervals day and night throughout. Serious toxic effects are more likely with prolonged minimal dosage than when a heavy dosage is employed over a short period—e.g., 4 to 6 days. Thus 8 to 9 gm. was given in the first 24 hours, 6 gm. in each 24 hours thereafter until the temperature had settled for 24 to 36 hours, and then 3 gm. in 24 hours for the next 36 to 48 hours. The average dose for the 36 cases was 25 gm. in 5 days. The rapid response of the temperature, pulse, and respirations, with improvement in general condition, originally described by Evans and Gaisford (1938) was obtained in every case. The only toxic effects of sulphapyridine were the characteristic cyanosis, which is not of importance, and nausea and vomiting, which were never such as to necessitate discontinuance of the drug by mouth. Blood changes, haematuria, and drug fever were not seen. A morbilliform rash appeared in one case at the end of the treatment.

The complications of lobar pneumonia were as follows: pleural effusion (sterile), 3; empyema, 1; haemoserotherax, 1; corneal ulcer, 1. In 35 cases (85.4%) there was uneventful resolution. The clear sterile effusions, regarded by Gaisford (1940) as representing aborted empyemata, cleared with two

or three taps, their only deleterious effect being to delay final recovery. The case of empyema (due to pneumococcus) cleared up with repeated aspiration alone, a course of sulphathiazole after the sulphapyridine being without obvious effect; this patient was finally discharged on convalescence after 76 days in hospital. The dendritic corneal ulcer necessitated 65 days' stay in hospital although the pneumonic process cleared rapidly. The case of haemoserotherax was remarkable.

The man was admitted on March 20, 1941, with lobar pneumonia (L.L.L.), which responded rapidly to 22 gm. of sulphapyridine over the next 4 days. A radiograph on April 1 showed complete resolution. He was up and about prior to discharge, when on April 7 he developed a temperature of 103.5° F., with dullness and defective breath sounds in the left-base, but at no time did he again appear very ill: these signs disappeared by April 10. On April 20 he again had dullness in the left base and a mild fever (100° F.). Chest exploration on the 26th and 28th produced 20 oz. and 50 oz. respectively of deeply blood-stained fluid, which was sterile and contained (on standing) an excess of lymphocytes. Thereafter the patient completely recovered without further treatment and was discharged, radiologically clear, 89 days after admission. The aetiology of this haemoserotherax, occurring after radiological proof of resolution and without further sulphapyridine, is mysterious.

Pneumonitis

During the twelve months 12 cases were seen (Table I) which appeared to be identical with cases described by Gill (1938) and Beaumont (1937) as "pneumonitis" and by Ramsay and Scadding (1939) and Scadding (1939) as "benign circumscribed pneumonia." The clinical picture is variable, but it is characterized by the moderate constitutional upset, appearance of x-ray shadows, and usually rapid recovery. The onset as a rule is subacute, with some malaise, cough, and sputum that may be blood-streaked, undue dyspnoea on exertion, loss of weight, and tachycardia. Fever is normally low, although occasionally a brisk reaction is seen, and there may be pain in the chest. Unlike lobar pneumonia, there is no respiratory distress at rest. Physical signs are impairment of percussion note, defective air entry or occasionally tubular sounds, and scanty fine rales, localized to one or two distinct areas. Sometimes abnormal physical signs are absent, the condition being diagnosed by x-ray opacities. All my cases had characteristic physical signs and recovered in a short period; it is probable that some of those without clinical signs were missed. Treatment was conservative in all instances, by rest, expectorants, etc., and there were no complications. The distribution of the disease in the 12 cases was: R.L.L., 6 cases; R.M.L., 1 case; L.L.L., 4 cases; L.U.L., 1 case.

The main importance of such cases lies in the differential diagnosis. From the above description the similarity in symptomatology to pulmonary tuberculosis will be obvious. Although the prominence of catarrhal symptoms and absence of tubercle bacilli from the sputum are a clue, in many cases ultimate diagnosis must await the benign course of the illness and complete disappearance of the x-ray shadows characteristic of "pneumonitis." The diagnosis will be particularly difficult in the initial stages when the localized x-ray opacity is in the upper zone of a lung. Other conditions may simulate "pneumonitis": delayed resolution of lobar pneumonia may produce an identical x-ray appearance, but the history of a preceding acute illness will differentiate the two conditions; transient lobar collapse, although rare, will be clinically similar, but the typical "jib-sail" basal shadow (of collapse) lying alongside the heart shadow will not be confused with the more diffuse opacity of "pneumonitis."

Two other little-recognized conditions, which in the early stages are indistinguishable from simple "pneumonitis" and are probably really more severe forms of the same condition, are "chronic circumscribed pneumonia" and "chronic suppurative pneumonia" (Scadding, 1939). In them the x-ray opacities persist for a very long time—abscess formation ultimately occurring in the latter—and they may leave behind permanent fibrosis, which does not result from "pneumonitis." One of the 2 cases in my series under the heading "Atypical Pneumonia" (Table I) was of this type of chronic pneumonia.

A man aged 42 was admitted with cough, sputum, and undue dyspnoea on exertion, having lost weight rapidly. Radiographs showed several fairly dense circumscribed opacities in each lung strongly suggestive of tuberculosis. Sputum examinations were

repeatedly negative. With rest, expectorants, adexolin, and open-air nursing the patient was returned to duty 68 days later physically fit, and radiologically the appearances of the lungs had become completely normal.

This group of cases has been discussed at some length because, while it is obviously desirable that soldiers suffering from pulmonary tuberculosis should be discharged to civil sanatoria as soon as possible, it is just as desirable that cases of "pneumonitis" should not be so discharged when complete recovery can be confidently predicted.

Bronchopneumonia and Atypical Pneumonia

Of the 8 cases of bronchopneumonia in this series (Table I) 7 occurred in chronic bronchitis, and it is to be expected that one death should occur and that two patients be rendered unfit for further service. The use of sulphapyridine and/or sulphathiazole was always associated with improvement, often to a marked degree, but the dramatic response obtained in lobar pneumonia did not occur. The eighth case was apparently of primary bronchopneumonia in a V.A.D. aged 26, producing high fever, moderate dyspnoea at rest, and fairly dense migratory x-ray shadows in both lungs, with associated clinical signs; the course of the illness, lasting 31 days, was uninfluenced by sulphanilamide and sulphathiazole, but complete clinical and radiological recovery ensued. The relation between this case and "pneumonitis" is probably one of degree.

One case of atypical pneumonia has already been referred to; the other case (Table I) was a metastatic bronchopneumonia from the recrudescence of an old staphylococcal osteomyelitis of the femur in a man who died apparently of septicaemia although blood culture was sterile; there was no radiographical evidence of actual abscess formation in the lungs, nor was the sputum abundant. The patients of this group should all be sent to a convalescent hospital and/or convalescent depot.

Uncomplicated cases of lobar pneumonia and "pneumonitis" should rarely cause absence from duty longer than 50 days, and some will be fit in a shorter period. The healthy young soldier does not require prolonged convalescence from an acute self-limited illness.

Chronic Phthisis, Arrested Phthisis, and Primary Tuberculous Complex, etc.

In this group of diseases the Army M.O.'s main interest must be early accurate diagnosis; questions of treatment, apart from the amelioration of urgent symptoms, must be left to the civil authorities, to whom each case should be transferred as soon as the diagnosis is made. Before discussing the problems of diagnosis it may be mentioned that to diagnose the presence of active tuberculosis when it is in fact absent is almost as serious a mistake as to miss its presence or to fail to investigate the possibility when it arises: both may cause serious injury to the patient—one perhaps impairing his chances in the world, the other leading him to an incurable stage of disease.

The soldier suffering from active chronic phthisis will first be seen by the unit M.O., on whom falls the onus of early diagnosis. The unit M.O. has to rely on clinical methods only, and his success in spotting the early case will depend largely on a careful present and previous case history along with his personal knowledge of the man. Table II shows the frequency with

TABLE II.—*Previous History in 64 Cases of Tuberculosis*

Pleurisy with effusion	8 cases (12.5%)
Pneumonia	4 " (6.3%)
Pulmonary tuberculosis	4 " (6.3%)
Spontaneous pneumothorax	1 case (1.6%)
Family history of pulmonary tuberculosis ..	15 cases (23.4%)

which a possibly significant previous history was obtained in the 64 active cases of this series; pleurisy with effusion is of great significance, but "pleurisy" alone may mean anything from a "stitch" to pneumonia. Haemoptysis had occurred in 10 of the 64 cases before admission. Careful physical examination is of the utmost importance, significant findings being tachycardia at rest, evening pyrexia, evidence of recent loss of weight, pallor, and unusual lassitude in a man previously known to be an active soldier. Abnormal physical signs in the lungs will of course at once arrest attention, but they have "inherited a position to which they are not entitled, and it cannot be too strongly emphasized that when they are present the case is probably more advanced than they seem to indicate, and, equally, their absence is not evidence of absence of disease" (Fenton and Burrell, 1930).

Active disease being suspected, the soldier should be referred to a medical specialist, who will, in addition to clinical methods, employ radiography, sputum examinations, sedimentation rates, and possibly blood examination, lipiodol, bronchoscopy, etc., for purposes of differential diagnosis. In the present series radiographs gave positive evidence of some abnormality in every case. The extent of lung involvement when the cases were first seen was: one lung, one lobe, 13 (20.3%); one lung, two or three lobes, 7 (10.9%); bilateral, two or more lobes, 44 (68.8%). The sputum was positive in 49 (76.6%) and negative in 15 (23.4%); the sedimentation rate was raised in 58 (90.6%) and normal in 6 (9.4%). In only 3 cases (4.7%) were positive x-ray findings associated with normal sedimentation rate and negative sputum examinations; it is in this small group that difficulty may arise, and the case history, physical examination, and radiographs should be considered very carefully by the physician in consultation with the radiologist. It may be necessary in a few cases to make repeated examinations for a period of time, but in the great majority a definite diagnosis is possible after 7 to 10 days in hospital: it is most unwise to commit oneself to a definite positive diagnosis without the help of hospital observation.

Of the 4 quiescent cases 3 had previously had sanatorium treatment, which fact the men withheld on enlistment, one actually entering the Army with a satisfactory artificial pneumothorax; in the fourth case a radiograph revealed much calcification and fibrosis in the upper zone. A few small scattered calcium opacities in the lung fields and hilar regions are, of course, not significant in the absence of other evidence.

One man showed a primary tuberculous infection of childhood type with Ghon's focus and mediastinal glands, which returned to normal after a period of rest and open-air nursing. No doubt primary infection is not uncommon in soldiers from sparsely populated areas, and, as in childhood, will usually pass unnoticed by the patient himself.

One man was labelled a "tuberculosis carrier" although it is realized that a small focus of lung disease must almost certainly have been present. A young officer who looked and felt extremely fit coughed up some scanty blood-stained sputum for 2 weeks; a very few tubercle bacilli were found after prolonged search by an enthusiastic laboratory technician on 4 out of 5 occasions, and the bacilli were cultured. During the 4 months he was kept off duty repeated radiographs and sedimentation rates were normal; cough and sputum were absent after the initial 2 weeks; guinea-pig inoculation was negative, and his weight remained as it had been for some years. He returned to duty, and 10 months after first being seen was completely well.

Pleural Effusions

Under this heading are included only cases of pleurisy with effusion presumed in the absence of other discoverable cause to be tuberculous, and 3 cases admitted with sterile effusion after treatment of recent pneumonia with sulphapyridine (Table I). Pleural effusion complicating phthisis (2 cases) and malignant disease (2 cases) are included in those sections.

Pleurisy with effusion is not difficult to diagnose clinically, but aspiration of the fluid should always be done not only to confirm diagnosis but also to determine the nature of the fluid and the cause of the effusion—often impossible on clinical examination alone.

The treatment of such tuberculous cases should wherever possible be conservative, any needling being confined to aspiration of only enough fluid for pathological examination. General measures should include open-air nursing whenever possible, high-calorie diet, and vitamins A and D in large doses. I find the sedimentation rate a better guide than x-ray examinations as to when to allow the patient up. Often the fluid is absorbed while the sedimentation rate remains elevated, and to permit the patient to be up and about freely at this stage is going too fast. Of course, in certain cases larger aspirations are necessary—e.g., if the fluid reaches the level of the second rib, if the mediastinum is grossly displaced, if dyspnoea is urgent, or if absorption is delayed longer than three weeks—even then only some of the fluid should be removed; under such circumstances air replacement may be done if apparatus is available. Of the 25 cases of this series conservative treatment was given in 17, aspiration was done in 6, and 2 had air replacement.

The final results obtained in these 25 cases of pleurisy with effusion were: complete resolution, 11; inactive pleural fibrosis, 12; activity—sanatorium, 2. The average stay in hospital is not significant, as some cases were transferred to sanatoria or civil hospitals after discharge from the Army. The disposal of such cases presents a difficult problem. It is of course known that people so affected ultimately develop pulmonary tuberculosis more often than the general population, but how often is unknown. The ultimate prognosis in adults is worse than in children; Graham (1925) traced 39 out of 56 children and found that 7 had developed tuberculosis. Vaizey and Perry (1940) found 1 child with pulmonary tuberculosis out of 33; on the other hand, they estimate that at least 30% of adults with tuberculous pleurisy ultimately develop lung disease. Kallner (1937) from a large series gives a tuberculosis morbidity figure of 39%, and concluded that tuberculosis was as common in those who had had sanatorium treatment as in those who had not. The patient recovered from tuberculous pleurisy should have a period of regulated living, fresh air, good food, and periodic medical observation; such is supplied to the full by service in the Army in one of the lower medical categories. A good rule would seem to be that the man with a small effusion which completely absorbs should be retained after an adequate convalescence (2 to 3 months off duty), whereas the large effusion or one which takes a long period to resolve, leaving much pleural thickening, should be considered a bar to further service. In future I shall advise the retention of a higher percentage of cases than in the present series.

"Sulphapyridine effusions" are mentioned only to stress the need for care in diagnosis. 2 of the 3 cases were referred to this hospital as tuberculous when the history made it clear they were in fact complications of pneumonia. The diagnosis is important, as treatment is by complete and, if necessary, repeated aspiration, and rapid recovery can be anticipated. Equally is it important to ensure that a pleural effusion diagnosed in a case on sulphapyridine is not a tuberculous one mistaken originally for pneumonic consolidation; in one such case, seen after completion of this series, unduly hurried convalescence had resulted in the development of miliary tuberculosis.

Miscellaneous Diseases

Under this heading a few notes are given below on some of the remaining diseases included in Table I.

Pulmonary fibrosis is of course a group of diseases: the cause of this condition in the 30 cases of this series was: bronchitis, 13; pneumonia, 8; lung abscess, 1; pleural effusion and haemothorax, 2; anthracosis, 1; hilar tuberculosis, 1. In 4 cases the cause was unknown. The disposal of such cases will naturally depend partly on the aetiology and partly on the presence or otherwise of cardiac insufficiency or severe lung damage. The term "fibrosis" has been reserved here for cases in which the radiograph showed a marked departure from normal. Even so, it was possible to retain 26 of these men in some capacity, often quite a strenuous one.

Bronchial asthma is rarely incompatible with useful military service. Indications for discharge are frequent severe attacks and definite secondary emphysema. The diagnosis should not be made on the history alone without accompanying physical signs of bronchospasm or emphysema. Two cases with a typical history of "asthmatic attacks" were seen in hospital in such attacks, which were manifestly hysterical and during which the absence of physical evidence was conclusive; a simple explanation resulted in the cessation of the attacks in both cases.

The 3 cases of spontaneous pneumothorax were benign—that is, investigation failed to reveal any evidence of pulmonary disease. One man was having his second pneumothorax in five years. Perry (1939) in 114 cases found that 70% were benign. My 3 patients recovered completely and returned to full duty on expectant treatment.

Bronchial haemangioma was the tentative diagnosis in a case in which there were frequent repeated moderate haemoptyses over a period of 18 months: radiographs, lipiodol, and several bronchoscopies failed to reveal the cause.

Of the lung abscesses, one complicated a pneumococcal pneumonia and one a post-operative streptococcal pneumonia treated elsewhere with sulphapyridine in insufficient dosage. Both recovered with medical treatment, with the spontaneous

evacuation of large amounts of pus by the bronchi, which was singularly fortunate. One man, although radiologically clear, was discharged from the Army because of a duodenal ulcer, the perforation of which had necessitated operation.

Summary

In 12 months 329 cases of respiratory disease were seen in the medical wards of a military hospital.

The aspects important to the Army M.O. in each group are discussed, with suggestions on treatment and disposal of such cases.

With the exception of tuberculosis, the great majority of soldiers with pulmonary disease can be returned to duty as useful men.

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PORPHYRINURIA IN TRINITROTOLUENE POISONING

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The traces of coproporphyrin excreted in health are so minute that for clinical purposes it may be accepted that porphyrins do not occur in normal urine. Any increased urinary excretion is termed "porphyrinuria," and the porphyrins present may be coproporphyrin or uroporphyrin, or both. The colour of the urine is no guide to their presence. Of 597 urines found to contain recognizable porphyrins only 61 (approximately 10%) were dark in colour—deep amber to mahogany brown—but these contained bile pigments as well, and none of the others turned dark on standing.

Increased porphyrin excretion denotes some disturbance of pigment metabolism and occurs in a variety of conditions, especially in diseases associated with disorder of liver function or of haemopoiesis, or of both. Dobriner, Rhoads, and Hummel (1938), studying the porphyrin excretion in aplastic anaemia, concluded that the pigment metabolism therein is similar to that in certain liver diseases and in lead and salvarsan poisoning, but different from that in pernicious anaemia or haemolytic jaundice. Rhoads and Barker (1938) in their review found that of 60 so-called primary cases of aplastic anaemia 27 gave a history of exposure to chemical compounds that might be haematologically toxic—e.g., benzene and arsphenamine. Porphyrinuria sometimes follows the long-continued use of such drugs as sulphonal, trional, veronal, etc., and Brownlee (1939) showed that it may result from the antipyretics—acetanilide, phenacetin, phenazone, amidopyrine, aspirin, and *p*-aminophenol. Toxic symptoms occasionally occur in cases being treated with one or other of the benzene-sulphonamide drugs, and Rimington and Hemmings (1938) have recorded abnormally high urinary excretion of coproporphyrins in patients being treated with sulphanilamide and also in rats given the drug.

Trinitrotoluene (T.N.T.) may damage the liver and cause toxic jaundice. A more serious, though less frequent, result of T.N.T. poisoning is aplastic anaemia, and sometimes aplastic anaemia follows the toxic jaundice. A common toxic effect is cyanosis, and gastric symptoms occur in T.N.T. workers—a toxic gastritis being recognized. In all cases a toxic effect, varying in