

On the treatment of pneumonia / by Alexander Smith.

Contributors

Smith, Alexander.
Royal College of Surgeons of England

Publication/Creation

Edinburgh : Printed by Oliver and Boyd, 1866.

Persistent URL

<https://wellcomecollection.org/works/huvy4p7q>

Provider

Royal College of Surgeons

License and attribution

This material has been provided by This material has been provided by The Royal College of Surgeons of England. The original may be consulted at The Royal College of Surgeons of England. where the originals may be consulted. This work has been identified as being free of known restrictions under copyright law, including all related and neighbouring rights and is being made available under the Creative Commons, Public Domain Mark.

You can copy, modify, distribute and perform the work, even for commercial purposes, without asking permission.



Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
<https://wellcomecollection.org>

ON THE
TREATMENT
OF
PNEUMONIA.

BY
ALEXANDER SMITH, M.D. EDIN.,
SURGEON ROYAL ARTILLERY.

EDINBURGH: PRINTED BY OLIVER AND BOYD.

MDCCCLXVI.

OF THE
TREATMENT

OF
PNEUMONIA

REPRINTED FROM THE EDINBURGH MEDICAL JOURNAL FOR JULY 1866.

ON THE TREATMENT OF PNEUMONIA.

THE following facts respecting the cases of pneumonia, treated in the hospital of the 47th Regiment, at various stations in Canada, between March 1862 and September 1865 (the period of my charge of that corps), are placed on record as a contribution to the data still required to enable the profession to arrive at definite conclusions, not only on the question of the treatment of pneumonia, but also as regards some points in the nature of that disease. The cases which came under observation occurred chiefly among soldiers of the 47th Regiment, but those of a few men of other corps, who were treated in the same hospital, are also included in what follows. The subjects of the attacks were all males, and the total number treated amounted to 108 cases, of whom 3 died, giving a mortality of 1 in 36.

The cases were distributed over the period in question as under:—

TABLE, No. I.

Years.	Periods.	Cases.	Deaths.	Remarks.	Stations.
1862	Mar. to Dec.	33	1	Priv., Ar. Hos. Cor.	Montreal.
1863	Jan. to Dec.	42	1	Corporal, 47th Regt.	{ Montreal, 5 m. Kingston, 7 "
1864	Jan. to Dec.	24	1	Private, 47th Regt.	{ Kingston, 5 " London, 3 " Hamilton, 4 "
1865	Jan. to Sept.	9	{ Hamilton, 4 " Toronto, 5 "
	Totals.....	108	3		

The 47th Regiment arrived in Canada in July 1861; and between that time and September 1865, the deaths above recorded were the only casualties which it suffered by pneumonia; that disease having, in the period named, caused the loss of only two men to the corps,

the third man who died having been at the time only temporarily attached to it. The ages of the men attacked ranged from fifteen to forty-four, as under:—

TABLE, No. II.

Years of Age.	No. of Cases treated.	No. of Deaths.
15 to 20	3	0
20 to 25	31	2
25 to 30	47	0
30 to 35	21	1
35 to 40	5	0
44	1	0
Totals,	108	3

Seventy per cent. of the whole attacks occurred in the periods of the different years extending from December to March inclusive; but the months of March, April, and May, were those which gave the highest numbers, having supplied respectively 21, 14, and 16 cases of the whole. The fewest seizures happened in the periods from July to October inclusive; whilst the highest number, 21, and the lowest, 1, recorded in any single month, fell respectively in March and September.

In attempting to analyze these cases, in order to estimate the amount of influence exerted on their duration and mortality by the nature of the treatment adopted, it will be desirable to examine those of each year separately, as well as to make a general comparison of the whole, adding such details of the characteristic cases as may give a general idea of the forms in which the disease occurred. In order, also, the better to show the effects of treatment, the cases will be classed into three divisions, according to the nature of the remedies employed, which may be stated, in a general way, as under:—

1st, Those cases in which general bloodletting was employed, at the outset of the disease, in conjunction with the application of turpentine fomentations to the chest, and the administration of tartar emetic in $\frac{1}{4}$ -gr. doses. The latter remedy was given at first every hour or every second hour, according to the urgency of the symptoms, until vomiting or some decided impression on the force of the circulation was induced. Afterwards, when these results had been produced, the intervals between the doses were extended to three or four hours whilst the symptoms continued with any degree of urgency. Finally, it was given only three times a-day. In cases where symptoms of nervous excitement existed, or the bowels became much relaxed, a few drops of laudanum were given with each dose of the antimony. In some of the early cases, calomel and opium, or hydrargyrum cum creta was administered; but the use of mercury in any form, with a view to the induction of its

constitutional action, was soon entirely abandoned, it having become evident that any apparent good effects which resulted from the administration of that drug were more than counterbalanced by the deterioration of health which, for some time, followed its employment.

When the force of the disease had been broken, and convalescence approached, bicarbonate of potash was given three times a-day, either in infusion of senega or water,—at first in the intervals between the doses of tartar emetic, but alone, after convalescence had been established, and the administration of the latter remedy was no longer considered necessary. Large blisters also were applied in those cases where, after other treatment had been employed, persistent pain indicated that pleuritic affection existed. Wine was likewise prescribed when, after the force of the disease had been broken, there existed signs of nervous disturbance indicated by a degree of increased frequency of pulse to which the rate of the respiration and the temperature of the body did not bear a due proportion.

It was also given, at any time in the course of the disease, when the pulse became weak. It may also be added that, as a general rule, a purgative of a drachm of compound jalap powder, with two grains of calomel, was administered on admission, provided the bowels were not already relaxed; but purging, beyond what might be necessary to obviate constipation, was not afterwards had recourse to as part of the treatment.

2*d*, The few cases in which cupping, followed by the other treatment detailed above, was employed instead of general bloodletting.

3*d*, Those attacks in which neither general nor local bleeding was had recourse to, but where reliance was placed on the use of turpentine fomentations, and the employment, according to the circumstances of the case, of the other remedies already mentioned, but with, in general, an earlier use of wine, where support was indicated.

In estimating the duration of the disease, the outset of the attack is reckoned from the occurrence of the rigor, and recovery is counted from the day on which the urgent symptoms had disappeared, and the patient was, as a general rule, placed on a better diet. The full periods of residence in hospital are also given; but it will be necessary to bear in mind that in this respect the results obtained in civil and military hospitals cannot fairly be compared with each other, because, in the majority of cases occurring among soldiers, the period of residence is, from the requirements of military duty, much longer than would be necessary in the case of a patient under treatment in a civil hospital, for an attack of pneumonia of equal severity.

Experience in the management of the sick of corps also has led me to discontinue the practice of allowing men to be convalescent

in barracks, unless under peculiar circumstances of rare occurrence, and to adopt the system of detaining every soldier in hospital, who may have been under treatment there, until fit to undertake at once any duty he might be liable to be called upon to perform. This consideration likewise will, in respect to the period of total residence in hospital, exert an influence on it to the disadvantage of a military hospital, when any attempt is made to compare the results of treatment in civil and military practice.

But in addition to the increased period of residence in hospital, which followed from the causes above named, the fact that not less than 70 per cent. of all the cases occurred during the most trying part of a Canadian winter, had likewise a very important influence on the duration of the period in question, as any increased severity of the weather often rendered it prudent to subject a soldier recently passed through a severe pneumonia, although in all respects well, to a still further period of detention in hospital, in the hope that a favourable change of weather might enable him to return to an every-day mode of life, requiring at all times during the winter months much exposure, not only in the course of duty, but even from the arrangements peculiar to a soldier's residence in a Canadian barrack.

Of the 33 cases treated between March and December 1862, 14 were bled from the arm at the outset of the disease, 3 were cupped, and 16 were neither cupped nor bled. The average duration, counting from the date of the rigor to the beginning of convalescence, in the 14 cases in which bloodletting was employed was $9\frac{1}{4}$ days, the shortest period 5 days, the longest 15; and the average total residence $23\frac{5}{4}$ days; the shortest period 9 days, the longest 58. Three cases, however, whose periods of total residence were 58, 47, and 25 days, had suffered relapses, after apparent recovery, on the twenty-sixth, nineteenth, and ninth days respectively. Of these 14 cases, 3 were bled more than once in the course of this disease. The first, a case of single pneumonia, was bled to 16 oz. on the third, and to 10 oz. on the fifth day of the disease: duration, 12; total residence, 28 days. The second, a case of double pneumonia, was bled to 14, 8, and 7 oz., between the first and fifth days; period of recovery, 8, and of total residence 17 days. The third, a case of single pneumonia, was bled twice, on the first day of the disease, to 7 and 6 oz. This case recovered on the sixth, and was discharged, to duty, on the fourteenth day of the disease. In the remainder of the cases, blood was drawn once in the course of the attack, and the quantity varied from 8 to 16 oz.,—average $12\frac{1}{2}$ oz. Of these 14 cases which were bled, 3 were double pneumonias, the remainder single, and all recovered.

Three cases lost blood by cupping only, but were otherwise treated much as above described, and with the following results:—The first case, one of double pneumonia, was cupped to 4 oz. on the

fourth, and died on the twelfth day of the disease. The second, a case of single pneumonia, was cupped to 8 oz. on the fourth, and recovered on the ninth day of the disease,—total residence, 23 days. The third, also a case of single pneumonia, was cupped to 6 oz. on the third, and recovered on the eighth day of the disease,—total residence, 27 days.

Of the 16 cases treated without bloodletting in any form, the average period of recovery was $8\frac{9}{16}$ days,—the shortest period 2, the longest 13 days. The average total residence was $15\frac{1}{2}$ days,—the shortest period 5 days, the longest 42. All these latter cases were, however, examples of the disease in a mild form, and 11 out of the 16 occurred during warm weather, between June and October. The existence of a milder temperature, whilst it caused attacks of a less severe character, led also to the total residence in hospital being shorter than usual in proportion to the periods of recovery. These last were all cases in which only one lung was attacked.

Of the 42 cases admitted in 1863, 5 were bled from the arm, and all recovered. The remainder were neither cupped nor bled, and of these one died. Of the cases not bled, one was received over from another hospital convalescent, and was discharged after 36 days' residence in hospital. Three more of the same number were treated in the Forty-Seventh hospital, but during my absence. The details of these 4 cases are therefore not included with the following. Of the 5 cases which were bled, 4 were simple, and one complicated. The average period of recovery of the 4 simple cases was 9 days, the shortest period 7 days, the longest 11. Average period of total residence, $30\frac{3}{4}$ days,—shortest period 24 days, longest 35. Of these cases, one was a double pneumonia, in which bloodletting was employed to the extent of 12 oz. in the fourth day of the disease, and to 15 oz. on the sixth. Recovery took place on the eleventh, and the man was discharged to duty on the thirty-second day. In the three remaining cases only one lung was affected, and the average quantity of blood drawn was $12\frac{1}{2}$ oz. The fifth case was one of double pneumonia grafted on bronchitis, to which the man was liable. The pneumonic symptoms disappeared in 25 days, but the patient was under treatment for 71 days before the complicating bronchitis abated. Bloodletting, to 12 oz., was employed in this case at the outset of the disease.

Of the remaining 33 cases treated without bleeding, one died on the twenty-fifth day of the disease, and the average period of recovery of the remainder was $8\frac{9}{16}$ days,—the shortest period 2 days, the longest 18. The average period of total residence was $33\frac{3}{16}$ days,—the shortest period 5 days, the longest (in a case where the greater portion of one lung became, for a time, consolidated) 128. These 33 cases were scattered over the whole year, but the larger proportion of them occurred in the winter months.

Of the 24 cases admitted in 1864, 8 were treated in my absence.

In 7, of the remaining 16, bloodletting was employed, and, of those so treated, one case died on the seventh day of the disease. The average period of recovery of the other six was $6\frac{1}{2}$ days,—the shortest period 4 days, the longest 8. The average period of total residence was $24\frac{1}{2}$ days,—the shortest period 20 days, the longest 29. Of the remaining 9 cases treated without loss of blood, the average period of recovery was $6\frac{2}{3}$ days,—the shortest period 4, the longest 10 days; and the average period of total residence was $23\frac{1}{3}$ days,—the shortest period 9, the longest 44 days. Of the 7 cases which were bled, one was a double pneumonia, the remainder were single. The whole of the 9 cases treated without bloodletting were examples of single pneumonia.

Of the 9 cases which were admitted between January and September 1865, 4 were bled from the arm, at the outset of the disease, in quantities varying from 10 to 14 oz. The average period of recovery of these cases was $7\frac{1}{4}$ days,—the shortest period 6, the longest 8 days; and that of total residence, $23\frac{1}{4}$ days,—shortest 20 days, longest 26. Of the remaining 5 which were not bled, the average duration was $6\frac{2}{3}$ days,—the shortest 4, the longest 9 days; and the average total residence, $22\frac{1}{3}$ days,—the shortest period 15, the longest 30 days. These were all cases of single pneumonia.

As regards the relative frequency of the side of the body attacked, the right lung alone was the seat of disease in 58 per cent. of all the cases, the left lung in 24, and both lungs together in 17 per cent.

The following tables will show the relative proportions borne by the periods of recovery and total residence in each year, to those of the other years under observation, in the two classes of cases according as they were treated (1st) with and (2d) without general bloodletting:—

1st, Average duration of uncomplicated cases (one complicated being omitted), treated by general bloodletting:—

TABLE, No. III.

Years.	Period of Recovery.			Period of Total Residence.			Cases.
	Average.	Shortest.	Longest.	Average.	Shortest.	Longest.	
1862	$9\frac{1}{4}$	5	15	$23\frac{5}{4}$	9	58	14
1863	9	7	11	$30\frac{3}{4}$	24	35	4
1864	$6\frac{1}{2}$	4	8	$24\frac{1}{2}$	20	29	6
1865	$7\frac{1}{4}$	6	8	$23\frac{1}{4}$	20	26	4
						Total...	28

2d, Average duration of uncomplicated cases treated without general bloodletting:—

TABLE, No. IV.

Years.	Period of Recovery.			Period of Total Residence.			Cases.
	Average.	Shortest.	Longest.	Average.	Shortest.	Longest.	
1862	$8\frac{9}{16}$	2	13	$15\frac{5}{8}$	5	42	16
1863	$8\frac{9}{32}$	2	18	$33\frac{3}{32}$	5	128	32
1864	$6\frac{7}{9}$	4	10	$23\frac{1}{3}$	9	44	9
1865	$6\frac{4}{5}$	4	9	$22\frac{1}{5}$	15	30	5
						Total...	62

1st, These tables show very distinctly, by numbers, what my own observation of the cases in detail had led me to conclude, viz., that the results noticed in cases treated by general bloodletting were, unquestionably, of a more uniform character than those which were observed in cases which recovered without the use of that remedy. This will best be understood from a statement of the average range in days, between the average lowest and highest periods of recovery and residence in hospital, which were as 5 and 19, to 9 and 53 respectively, for 28 cases bled, as compared with 62 not so treated.

2d, They demonstrate, also, that the relative periods for which the cases were under treatment in 1863 were considerably greater than for any of the other years under consideration; and, to account for this difference, two sets of conditions may be stated as having probably more or less influenced its production. One of these had reference to the circumstances in which the men themselves were actually placed; the other, and probably not the least important of the two, depended on a temporary change which my own views underwent as to the mode of treatment to be adopted.

The first consideration referred to was the removal of the regiment from a barrack placed in a comparatively open, elevated, and airy position, in the town of Montreal, and from the advantages of an hospital where the convalescent sick could have the benefit of open-air exercise in almost any weather, to a set of buildings temporarily occupied as a barrack, and situated in a crowded, low-lying, and unhealthy part of the same town, with the disadvantage, moreover, of an hospital which, from its position and construction, was not only indifferently lighted and ventilated, but was likewise unprovided with means of open-air exercise for the convalescent sick during winter weather. That the circumstances of the soldiers' accommodation had an influence on the type of their diseases, I have very little doubt; and, accordingly, the attacks of pneumonia from which they suffered whilst those conditions lasted were of a more asthenic type than those which came under observation in the course of the previous and subsequent years, when their barrack accommodation was better. I have also a strong suspicion

that the circumstances of the men whilst under treatment in hospital, more especially in respect to open-air exercise in the course of their convalescence, materially influenced the duration of their attacks.

To the circumstance, however, of a temporary change having taken place as regarded my own views of the best plan of medical treatment to be adopted, I am inclined to attach the most importance of all; and I will now briefly state what that change was, and how it originated. Having observed that, under the influence of the warm weather of the summer and autumn of 1862, the cases of pneumonia which occurred in the course of those seasons were much milder in character than those which had occurred during the winter and spring months, I was led to discontinue the use of bleeding; and, having remarked the apparent success which attended that less active plan of treatment, at a time when my mind had been rendered undecided on the question of bloodletting by the strong feeling of opposition to its employment which then existed among the members of the medical profession, I was led to consider, whether, in resorting to bloodletting as the most essential part of the treatment of a disease asserted to be the same under every variety of circumstances, and at all times better treated without that remedy, I had not, after all, adopted a course which was unnecessarily severe.

I was, therefore, induced to inquire whether equally satisfactory results might not, on the whole year, have been obtained without loss of blood at all. Bloodletting was, accordingly, in 1863, employed only in such of the cases as, at the outset, threatened to be unusually severe, and of a nature to deter me from submitting them to the risk of what was virtually an experiment. A review, however, of the results of this less active plan of treatment forced upon me the conclusion that in no respect were they equal to those obtained under a more general practice of bloodletting, the good effects of which were in no way rendered more apparent than by the fact, that, whereas in 1862, when the disease had been actively treated, the lung affection very rarely overstepped the stage of congestion or engorgement, in 1863, on the contrary, that of hepatization rendering a lengthened convalescence inevitable, was frequently reached in cases subjected to a less effective method of treatment.

I therefore resolved to resume the treatment by bloodletting, so soon as the attacks of 1864 should have changed from the mild type of summer to the more severe form of the winter months. This was accordingly done, and with the success anticipated, excepting in the first serious attack of the season, which was, unfortunately, not bled at the outset of the disease: its early indications having been believed to be favourable to recovery without bloodletting. In that case, however, bleeding was subsequently employed, but at a stage of the complaint when there was very little certainty of its

making any impression for good on its progress. The following table of the ratio per cent. of cases bled, and of the average periods of recovery and total residence, for the whole of the cases of each year, will show at a glance—so far as that can be taught by numbers—the influence exerted by bloodletting on the duration of the disease :—

TABLE, No. V.

Years.	Per-centage of Cases Bled from the Arm.	Average Periods of Recovery of Total Cases in each Year.	Average Periods of Total Residence of all Cases in each Year.
1862	42 $\frac{1}{3}$	8 $\frac{4}{5}$	20 $\frac{4}{5}$
1863	13 $\frac{6}{8}$	8 $\frac{1}{5}$	32 $\frac{5}{8}$
1864	37 $\frac{1}{2}$	6 $\frac{2}{3}$	23 $\frac{1}{15}$
1865	44 $\frac{4}{9}$	7	22 $\frac{2}{3}$

The subjoined details of a few of the cases will give the reader a good general idea of the whole. The summaries, also, of the three fatal cases with which these extracts close, will, I think, prove instructive :—

CASE I.—Private Henry Veasey, 47th Regiment, age 28. —*November 28th*, 1864.—A stoutly made man, of bad character, who reported himself sick yesterday morning, and stated that, although feeling slightly ill from a cold for a few days previously, he had been fit for duty until that morning, when he was attacked with rigor, followed by cough and pain in the right breast. No evidence of pneumonia was then detected on examination of the chest. A purge was administered, and he was ordered to bed.

This morning there are undoubted signs of pneumonia affecting the greater part of the right lung; the expectoration is rust-coloured and tenacious, and the cough causes great pain of the right breast. Pulse 80; respiration 28. Was this morning bled to $\frac{3}{4}$ xvj., which he bore without syncope. To have ant. tart. gr. $\frac{1}{4}$, every third hour, unless much nauseated. Turpentine fomentations to the affected side three times a-day. Diet, spoon (tea, bread, and arrowroot), with two pints lemonade for drink.

29th.—Pulse 84; resp. 24; crepitation audible, but more air entering the lung than on yesterday. Expectoration copious, very fluid, and plum-juice-coloured; not so much pain. Continue the treatment by antimony and fomentation as above. Diet and drink as on yesterday.

30th.—Pulse 60; resp. 20; air entering the lung freely, with coarse crepitation; expectoration fluid, copious, and rust-coloured. Treatment and diet as on yesterday.

December 1st.—Pulse 68; respiration natural; steadily improving; no pain. Air entering the lung freely, with large crepitation; expectoration copious, fluid, and still rust-coloured, but less so than on yesterday. Antimony to be given three times a-day, and fomentations to be used twice a-day. Beef-tea diet, lemonade.

3d.—Pulse 72; resp. 22; air entering the lung freely; very little crepitation; expectoration scarcely at all tinged, but slightly purulent. To have bicarb. potassæ, gr. xv., in aquæ $\frac{3}{4}$ iv. three times a-day. Omit the antimony and fomentations. Beef-tea and lemonade.

5th.—Pulse 68; resp. 18; no expectoration; scarcely any cough; air entering the lung freely; coarse crepitation at the base, with the expiratory murmur only. Bicarbonate of potash as above. Diet low.

7th.—Pulse 60; resp. 20; air entering the whole lung; prolonged sound of expiration at the base, with harshness more than crepitation; no cough or expectoration. Treatment as above. Diet low, with two eggs and one pint of milk.

10th.—Respiration natural; no cough or expectoration. Treatment and diet as above.

20th.—No relapse; now quite strong; discharged to duty. Diet, roast chop from the 11th, with one pint beer daily from the 14th.

CASE II.—Private Michael Tierney, 47th Regiment, age 28.—*November 29th, 1864.*—Admitted yesterday from the guard-room, in which he was confined for drunkenness on the 26th inst. On the night of the 27th was attacked with rigor, which was followed by cough. On admission there were distinct signs of pneumonia affecting the greater part of the right lung, and attended with pain and rust-coloured tenacious expectoration. He was bled to $\frac{3}{4}$ xij., without syncope, in the course of the evening.

Passed a restless night. Pulse now 120; resp. 39; crepitation audible over the greater part of the right lung; expectoration plum-juice-coloured, but not of a very dark tint. The blood drawn did not show the "buffy coat." To take ant. tart. gr. $\frac{1}{4}$, with tinct. opii. m. x., every fourth hour; half an ounce of wine every second hour. Turpentine fomentations to the affected side of the chest three times a-day. Diet, spoon, with lemonade.

30th.—By last evening the pulse had fallen to 116; to-day it is 94; resp. 28. Feels considerably better. Air entering the lung freely; coarse crepitation over the greater part of it; expectoration copious, fluid, and tinged rust colour. Remedies, diet and wine as above.

December 1st.—Feels better; pulse 84; air entering the whole of the lung, but crepitation very well marked with the sound of expiration; expectoration fluid and less tinged; no pus in it; slight pain at the lower part of the affected side. Had some sleep in the course of the night, and is less nervous in appearance. Skin moist; tongue loaded with a white fur, but also moist. Continue the antimony with opium, as above, every fourth hour; also the fomentations as before. Diet and wine as above.

3d.—Pulse 80; resp. 28. Has steadily improved since last report. Skin moist; no pain; much less cough; expectoration copious, fluid, and moderately tinged. To have antimony with opium, as above, three times a-day. The fomentations to be omitted. Beef-tea diet from the 2d, wine and lemonade as before.

5th.—Pulse 76; resp. 25. Has steadily improved since the 3d. Air entering the lung freely; coarse crepitation at the base; expectoration fluid, mucous, and untinged; slight pain at the lower part of the right side of the chest on full inspiration. The antimony was omitted yesterday, when potassæ bicarb. gr. xv., in infus. senegæ $\frac{3}{4}$ ij., was ordered three times a-day. The latter to be continued, a blister to be applied to the seat of pain, and pulv. Doveri gr. xij. given at bedtime. Beef-tea diet, wine and lemonade as before.

6th.—Continues steadily improving; very little cough, and a mere trace of expectoration. The blister acted well, and has quite removed the pain complained of in the region of the lower false ribs of the right side, and which was probably pleuritic in its character. Diet and treatment as above.

10th.—Pulse 78; resp. 24; air freely entering the lung, with the exception of a small portion at the base where the respiratory murmur is obscured, but without crepitation; slight increase of dulness on percussion at the spot in question; scarcely any cough; slight, untinged, mucous expectoration. Diet low from the 7th, with wine, two eggs, and one pint milk on this date. The alkali continued as above.

13th.—Steadily improving; neither cough nor expectoration. Omit the medicines. Diet as above.

22d.—Has been steadily improving in strength since last report, and there has been no return of pulmonic symptoms; but being a prisoner he is detained

longer than usual under observation. Diet, roast chop from the 14th, with one pint of beer daily from the same date.

25th.—Quite well; discharged to duty. Diet and beer as above.

CASE III.—Private John Walsh, 47th Regiment, age 20.—*November 29th, 1864.*—Attacked yesterday morning with rigor, which was followed by cough. Admitted into hospital in the evening, suffering from severe cough, attended with pain in the right side of the chest, and with obscurity of the respiratory murmur at the base of the corresponding lung. There was no expectoration. Pulse 108, full and bounding. He was bled to $\frac{3}{4}$ xvj., with marked relief to his symptoms. This morning the pulse is 96; respiration 28, and attended with less pain; air entering the lung with tolerable freedom; crepitation at the lower part, and the sound of expiration prolonged. Blood drawn last evening presents the "buffy coat." To have ant. tart. gr. $\frac{1}{4}$, every third hour; turpentine fomentations to the chest three times a-day. Spoon diet, with lemonade.

30th.—Now free from pain. Pulse 60; resp. 20; air entering the lung; much less cough; coarse crepitation, mixed with bronchitic rales; expectoration muco-purulent, only one streak of blood. Diet and remedies as above.

December 1st.—Not quite so well as on yesterday. Cough more troublesome; expectoration slightly tinged with blood; air entering the lung, but crepitation very marked with the expiratory sound,—that of inspiration very little audible. Pulse 92, and slightly weak. Continue the antimony, as above, every third hour, also the fomentations three times a-day. To have two ounces of wine. Diet, beef-tea; drink as above.

3d.—Yesterday morning had much improved, the pulse having fallen to 84, and the respiration to 22, whilst air entered the lung much more freely. To-day the pulse is 68; resp. 20; skin moist; expectoration copious, and fluid. Yesterday, three doses of antimony, with tinct. opii. m. x., in each, were administered in the course of the day. The fomentations also were continued. The antimony and opium to be continued as on yesterday, the fomentations to be omitted. Beef-tea diet, with three ounces of wine.

5th.—Has steadily improved since last report. Was yesterday ordered bicarb. potassæ, gr. xv., in infus. senegæ, $\frac{3}{4}$ ij., three times a-day. Antimony and fomentations were omitted. To-day there is very little cough, and no expectoration. Pulse 60; resp. 22; air entering the whole of the lung; slight coarse crepitation at the base. Continue the alkali. Low diet.

7th.—Pulse 56; resp. 20; air entering the whole of the lung; occasional large crepitation at the base, chiefly with expiration; no cough or expectoration. Continue the alkali and diet as above, two eggs, one pint milk.

10th.—Pulse 60; resp. quite natural; neither cough nor expectoration. Continue the alkali. Low diet, eggs and milk.

11th.—No sign of disease, but slightly debilitated. Omit the medicines. Low diet, eggs and milk.

14th.—Continues free from disease, and regains strength. Diet, roast chop from the 13th, with one pint beer.

21st.—Respiration natural. Feels strong and able to return to duty, to which he is now discharged. Diet with beer as above.

CASE IV.—Private Thomas Williams, 47th Regiment, age 28.—*December 3d, 1864.*—Was attacked with rigor on the 30th November, when on guard, and began to suffer from cough on the next day, when he was admitted into hospital with obscure signs of pneumonia. He was ordered a purge, with tartar emetic every third hour, and the usual turpentine fomentations. Yesterday the pulse was 100; respiration 24; and there was evidence of well-marked pneumonia at the base of the right lung; but, as the pulse was rather deficient in strength, it was hoped that antimony and fomentations would be sufficient to control the disease. To-day, however, there is great heat of skin, troublesome cough, and rust-coloured and rather tenacious sputa. Pulse 108, and rather sharp; respiration 32; well-marked pneumonia, in the first stage, at the

base of the right lung. To be bled to ℥viiij . Ant. tart. gr. $\frac{1}{4}$, every fourth hour; turpentine fomentations three times a-day. Diet, spoon, with lemonade.

4th.—Became faint when ℥viiij . of blood had flowed, but is considerably better. To have ant. tart. gr. $\frac{1}{4}$, with tinct. opii, m. x., three times a-day. Diet as above.

5th.—Pulse 96; resp. 22; expectoration very copious and fluid, but less tinged than on yesterday; air entering the whole of the lung, with coarse crepitation at the base. Continue the antimony and opium as on yesterday. Omit the fomentations. Beef-tea diet, with lemonade.

6th.—Pulse 84; resp. 24; air entering the lung freely; crepitation less marked than on yesterday; expectoration fluid and frothy, very little tinged with blood. To have bicarbonate of potash in infusion of senega, three times a-day. The chest to be twice fomented. Diet, beef-tea and lemonade.

7th.—Pulse 76; resp. 18; very slight cough; expectoration fluid and untinged; large crepitation at the base of the lung. Continue the bicarbonate of potash. Omit the stupes. Diet, beef-tea with lemonade.

9th.—Pulse 72; resp. 22; very little cough; expectoration fluid, mucous, and untinged; air freely entering the whole of the lung; still slight crepitation at the base. Continue the potash. Low diet with lemonade.

10th.—Pulse 76; resp. 22; expectoration copious, and untinged; large crepitation still audible at the base of the lung. Potash continued. Low diet, with two eggs, and one pint of milk.

12th.—Pulse 68; resp. 20; air entering the lung freely; still slight crepitation at the base; expectoration fluid and untinged. Continue the potash. Diet as above.

16th.—Left his bed yesterday for the first time. Free from cough; no expectoration; resp. natural. Omit the potash. Diet, roast chop with a pint of beer.

22d.—Rapidly regaining strength; no cough or expectoration; states that he is quite well. Diet and beer as above.

26th.—States that he feels quite strong, but looks rather delicate; no cough; respiration natural. Diet, etc., as above.

27th.—Continues well, and is anxious to return to duty. Discharged.

CASE V.—Private George Arnold, 47th Regiment, age 23.—*December 8th*, 1864.—This man, who is employed as an officer's servant, had an attack of pneumonia of the right lung in August 1863. He was then treated by blood-letting, and tartar emetic, and was under treatment for 27 days. On the night of the 6th inst., during severe weather, he was sent a message for his master. In the course of the same night he had a rigor, and began to suffer from cough almost immediately afterwards. He was admitted into hospital on the following morning, with signs of incipient pneumonia at the base of the right lung. Was ordered a purge, and to take ant. tart. gr. $\frac{1}{4}$, every third hour. Turpentine fomentations were also applied three times a-day. In the evening a vein was opened, but as syncope threatened, no blood was drawn. This morning the pulse is 112, respiration 40. Did not begin to expectorate until this morning, and what he brings up is tenacious, and very much tinged. There is crepitation over the right lung, as high as the level of the third rib, both before and behind. Has been bled to xij ., with much relief to the breathing. To have ant. tart. gr. $\frac{1}{4}$, with tinct. opii, m. x., every third hour. Turpentine fomentations three times a-day. Diet, spoon, with lemonade.

9th.—Pulse 100; resp. 40; air entering the whole of the lung; small crepitation, mixed with sonorous rales; expectoration copious, very much tinged, and rather tenacious. Very little uneasiness in the chest; bowels rather relaxed; less thirst than yesterday. Continue antimony every third hour, with tinct. opii, m. x., in the two first doses. Continue the fomentations. Spoon diet and lemonade.

10th.—Pulse 92; resp. 32; air freely entering the whole lung; coarse crepitation only at the base; expectoration more fluid, and very little tinged.

Continue the antimony as above, but without opium. Beef-tea diet, with lemonade.

11th.—Pulse 76; resp. 28; air entering the whole lung freely; prolonged expiration, with crepitation at the base; expectoration copious, fluid, and slightly tinged. Continue the antimony and fomentations. Beef-tea diet and lemonade.

12th.—Pulse 76; resp. 28; air entering the lung freely; very slight crepitation; expectoration very little tinged. Treatment and diet continued as above.

13th.—Pulse 72; resp. 24; air entering the lung freely, accompanied by loud sonorous rales; no crepitation; expectoration copious and untinged. To have bicarbonate of potash in infusion of senega three times a-day. Low diet, two eggs, one pint milk.

14th.—Pulse 68; resp. 20; expectoration small in quantity and untinged; very little cough; respiration almost natural, but sound of expiration still prolonged, and a little rough in tone. Potash and diet as above.

16th.—No cough; progressing favourably. Treatment as above. Diet, roast chop.

19th.—Air freely entering the lung; occasional sonorous rales; no crepitation; neither cough nor expectoration. Diet and remedies as above.

21st.—Air entering the lung freely; no crepitation; neither cough nor expectoration. Omit remedies. Diet as above, with one pint beer daily from 20th.

22d.—Rapidly regaining strength; no cough or expectoration; respiration natural. Diet and beer as above.

24th.—Respiration natural; feels strong and able to return to duty, to which he is discharged.

CASE VI.—Private John Ryan, 47th Regiment, age 21.—*December 12th, 1864.*—Was discharged from hospital on the 30th of last month, after a very mild attack of scarlatina. He had in the interval fully regained his previous strength. At 9 A.M. yesterday he was attacked with rigor and felt cold during the whole day, and until late in the evening, when he became hot and feverish. About 3 A.M. of to-day he began to suffer from pain in the right side of the chest, attended with slight cough. The pulse is now 100; resp. 40; temperature in the axilla 105° . There is slight crepitation audible with the sound of inspiration at the base of the lung; prolonged and roughened sound of expiration at the same point; no expectoration; ant. tart. gr. $\frac{1}{4}$, every third hour; turpentine fomentations three times a-day. Diet, spoon, with lemonade.

13th.—Pulse 108; resp. 28; temperature barely 104° ; air freely entering the whole of the lung, no crepitation, but slight roughness with the sound of expiration at the base. Treatment and diet as above.

14th.—Pulse 100, rather sharp; resp. 34; air entering the lung, with tolerable freedom down to the base; crepitation audible about half-way up the lung, but not well marked; cough became more troublesome in the course of the night; considerable distress of breathing, with pain below the right axilla; expectoration not very copious, rust-coloured, and tenacious; considerable thirst; has been, this morning, bled to $\frac{3}{4}$ x. To have ant. tart., gr. $\frac{1}{4}$, with tr. opii, m.x., every third hour; turpentine fomentations as above. Diet, spoon, with lemonade.

15th.—Pulse 112; resp. 28; expectoration tenacious, rather scanty, and considerably tinged; air entering the lung with tolerable freedom; crepitation well marked towards the base; tongue furred and slightly dry at the tip; much thirst, and cough very distressing. The antimony to be continued as on yesterday, but without opium; turpentine fomentations as before. Diet, beef-tea; lemonade, with $\frac{3}{4}$ ss. wine every second hour.

16th.—Pulse 96; resp. 28; cough much less troublesome; expectoration more copious and fluid, but still rust-coloured; air entering the whole of the lung with tolerable freedom, and attended with large crepitation towards the base; tongue moist; less thirst. Treatment and diet as on yesterday.

17th.—Pulse 92; resp. 36; tongue rather furred, but moist; complains of sharp pain at the lower part of the right side; air, however, entering the lung freely with large crepitation; expectoration more copious, fluid, and less tinged than on yesterday; to have a blister, six by four inches, applied to the right side. To take potassæ bicarb., gr. xv., three times a-day; the antimony to be omitted, but the fomentations continued until the blister is applied. Three ounces of wine in half-ounce doses, every two hours. Diet as above.

18th.—Pulse 88; resp. 24; the blister has acted well, and he is now quite free from pain; expectoration not very copious, but fluid and untinged with blood. Treatment and diet as above.

19th.—Pulse 80; resp. 24; much less cough; expectoration fluid and untinged; tongue less furred and quite moist. Treatment as above. Diet, beef-tea, with two eggs, and one pint of milk.

20th.—Pulse 76; resp. 24. Treatment as above. Diet, low, with eggs and milk.

21st.—Pulse 84; resp. 24; air entering the lung freely; slight roughness with the sound of expiration, but no crepitation; very little cough; slight mucous expectoration; no tinge of blood. Continue the potash. Diet as above.

24th.—Pulse and respiration natural; no cough or expectoration for the last forty-eight hours. Roast-chop diet; one pint of beer.

30th.—Quite well for more than a week past. Discharged to duty.

CASE VII.—Lance-sergeant Robinson, 47th Regiment, age 37.—*January 5th, 1865.*—Was attacked with rigor in the forenoon of the 3d instant, and cough soon followed. He had suffered from cold for a few days previously; admitted into hospital yesterday morning, but did not then suffer from well-marked signs of pneumonia; to-day there is crepitation over the right lung, as high as the angle of the scapula, which is most marked with the sound of expiration; he states that he had a similar attack last year when at Gananoque, drilling volunteers, and was there treated by a civil practitioner, who bled him to about one pound; states also, that he quite regained his previous strength, and never felt better than a short time previous to his present attack; the expectoration is now rust-coloured, but fluid, and brought up with tolerable freedom; pulse 84; resp. 30; temperature 103°. Since the pulse, etc., was recorded this morning, he has been bled to $\frac{3}{4}$ xij.; to take ant. tart., gr. $\frac{1}{4}$, every third hour; turpentine fomentations three times a-day. Diet, spoon, with lemonade.

6th.—Pulse 76; resp. 20; temperature 98°; air freely entering the lung, down to the base; crepitation still distinct; expectoration less tinged, but rather tenacious; blood drawn yesterday shows the "buffy coat;" bowels constipated. Continue the antimony every third hour, with 3i. of sulph. magnesiae in each dose; the fomentations to be continued; diet and drink as above.

7th.—Pulse 76; resp. 20; temperature 100°; air entering the lung freely, with coarse crepitation; signs of bronchitis heard under the axilla; cough short and troublesome; expectoration untinged and fluid, but less in quantity. Antimony, gr. $\frac{1}{4}$, every second hour, until vomiting is produced,—afterwards every third hour; to have tinct. camph. co., 3i. with the first dose of antimony; fomentations to be continued. Diet, beef-tea; drink as above.

8th.—Pulse 96; resp. 32; temperature 103°; air entering the lung freely down to the base; coarse crepitation mixed with sonorous rales; sharp pain in the side a little below the breast; expectoration rather scanty, very tenacious, and of a slightly yellow tinge; tongue furred, but moist. To have a blister applied to the right side; antimony, gr. $\frac{1}{4}$, and tr. opii, m. v., every third hour. Diet, spoon, with lemonade; wine $\frac{3}{4}$ ss., every second hour.

9th.—Pulse 88; resp. 22; temperature 102°; air entering the lung, with coarse crepitation, and sonorous rales, audible chiefly on forced respiration, and then, most distinctly with the sound of expiration; the blister has acted well, and there is less pain; cough less troublesome; expectoration more

copious and brought up with less difficulty, but still very tenacious, and tinged of a yellow colour as if mixed with bile. Antimony to be continued every third hour, and potassæ bicarb., gr. xv., in water, ℥ iij., also every third hour, but between the doses of antimony. Diet, wine and lemonade as above.

10th.—Pulse 76; resp. 20; temperature 98°; was attacked last evening with a "stitch" a little below the nipple of the right side; a small blister was applied, and the pain is now much less severe; there is still some complaint of pain under the spot over which the first blister was applied; the cough is much less troublesome; the expectoration also is brought up with much more freedom, it is still tinged of a yellow colour and rather tenacious; quantity rather smaller than on yesterday; air entering freely down to the base of the lung; large crepitation. Antimony and bicarbonate of potash three times a-day. Diet, wine, and lemonade as above.

11th.—Pulse 72; resp. 20; temperature natural; no pain; much less cough; expectoration more fluid and much less tinged. Omit the antimony; continue the potash. Diet and wine as above.

12th.—Pulse and respiration natural; much less cough; expectoration fluid and untinged; bowels constipated; to have pulv. jalapæ comp. ℥ i.; continue the potash. Diet, low; wine continued.

18th.—No cough or pain; air entering the lung freely, but still slight crepitations at the fore part of the base, audible chiefly with expiration. Diet, roast chop, with one pint beer, and two eggs, from the 17th.

22d.—Respiration natural; feels well and able to return to duty, to which he is now discharged.

CASE VIII.—Private Patrick Brady, 47th Regiment, age 22.—*January 23d*, 1865.—Went to bed well on the 21st inst., but, about 5 o'clock on the following morning, he was attacked with rigor; about two hours afterwards cough commenced, and about 1 P.M. he began to expectorate mucus tinged with blood; about 2 P.M. of the same day he was admitted into hospital; his pulse was then 96; respiration 24; at 5 P.M. he was bled to ℥ xiv., and ordered antimony every third hour, with turpentine fomentations to the chest. This morning the pulse is 104; respiration 24; temperature 100°; the pulse is soft, the skin moist, and the cough less severe; air enters the whole of the lung, but the sounds of respiration are somewhat obscured; there is small crepitation at the base behind; coarser opposite the angle of the scapula; expectoration copious, frothy, and tinged a bright scarlet; to have ant. tart., gr. $\frac{1}{4}$, with sulph. magnesiae, ℥ i., every third hour; turpentine fomentations three times a-day. Diet, spoon, with lemonade.

24th.—Pulse 72; resp. 20; temperature 101°; air entering the lung freely down to the base; small crepitation audible there chiefly with the sound of expiration, which is in duration as two to one compared with that of inspiration; large crepitation audible behind, on a level with the nipple; expectoration fluid, in considerable quantity, and thoroughly tinged with blood of a bright red colour; cough less troublesome; tongue loaded, but moist; no thirst; slight pain near the right nipple. Ant. tart., gr. $\frac{1}{4}$, three times a-day; omit the fomentations. Diet, spoon, with lemonade.

25th.—Pulse 64; resp. 32; temperature 100°; air entering the lung freely; still slight crepitation; expectoration more fluid and very much less tinged; cough very troublesome last evening, but now much less so since the application of a mustard-plaster. Continue the antimony as above. Diet, beef-tea, with lemonade.

27th.—Air entering the lung freely; large crepitation near the base; respiration natural as to frequency; expectoration fluid, frothy, and very little tinged. Omit the antimony; to take bicarb. potassæ, gr. xv., three times a-day. Diet, beef-tea, with wine ℥ ij.

29th.—Pulse and respiration natural; air entering the lung; very little crepitation; expectoration fluid, frothy, and not at all tinged. Continue potassæ bicarb. as above. Diet, low, with two ounces wine.

February 13th.—By the 3d instant, all the symptoms had abated; since that date he has been gradually regaining strength; now well in every respect; discharged to duty. Diet, roast chop, with one pint of beer daily from the 3d to the present date.

CASE IX.—Private Francis Nash, 47th Regiment, aged 30.—*February 5th, 1865.*—A weakly man of rather intemperate habits; was under treatment in hospital for 44 days, in July and August 1864, at London, Canada West, for an asthenic attack of pneumonia of the right lung, complicated with ague and diarrhoea, which he contracted when on outpost duty. He was confined in the guard-room for drunkenness about 2 P.M. of the 2d instant; at 4 o'clock on the following morning he had a rigor, and felt sick and ill; admitted into hospital the same morning, suffering, apparently, from the effects of drink; in the course of the same night he began to cough and to suffer from pain in the right side of the chest, and on the 4th he began to expectorate, bringing up mucus slightly tinged with blood. To-day there is moderate cough, and the expectoration is copious and tolerably fluid, but slightly tinged with blood; pulse 96; resp. 28; temperature 98°. To have ant. tart., gr. $\frac{1}{4}$, three times a-day; turpentine fomentations every fourth hour. Diet, beef-tea, with lemonade.

8th.—Pulse 104, soft, but rather weak; resp. 36; expectoration a good deal tinged, and in considerable quantity, but very tenacious; tongue furred and rather inclined to be dry; a blister was applied to the side yesterday; it has acted well; he had bicarb. potassæ, gr. xv., three times, and no antimony, also two ounces of wine. The potash to be continued to-day as on yesterday, but gr. $\frac{1}{4}$ ant. tart. to be given with each dose. Diet, beef-tea, with two ounces wine.

9th.—Pulse 100; resp. 32; temperature 103°; tongue furred and slightly dry; face flushed; air entering the lung freely, but small crepitation very distinctly marked towards the base; expectoration moderate in quantity, very tenacious, and brought up with difficulty, tinged throughout with blood; cough troublesome, no pain. Antimony and potash continued as above. Beef-tea diet; two ounces wine, one pint milk.

10th.—Pulse 76; resp. 32; temperature 99°; expectoration more fluid, brought up with less difficulty, and not so much tinged; tongue less furred, but still rather dry at the tip; the cough continues troublesome; less thirst. Continue the remedies; diet, wine, etc., as on yesterday.

11th.—Pulse 60; resp. 28; temperature natural; much less cough; expectoration fluid and easily brought up, but still a little tinged; tongue much less furred and quite moist. Antimony, gr. $\frac{1}{4}$, twice a-day; potash three times a-day. Diet, low, with three ounces wine, and one pint milk.

12th.—Pulse 60; resp. 25; tongue clean and moist; expectoration copious, fluid, and slightly tinged; air entering the lung freely down to the base, where there is large crepitation behind; relative length of the sounds of inspiration and expiration natural. Omit the antimony; continue the potash as above. Diet and extras as on yesterday.

15th.—Pulse 72; resp. 24; coarse crepitation still audible at the base of the lung; very little cough; muco-purulent expectoration in small quantity, slightly tinged with blood. Potash continued; also diet and extras as above.

21st.—No cough or expectoration; rapidly regaining strength; slight coarse crepitation still audible at the base of the lung, but air entering freely. Continue the potash as above. Diet, roast chop, with one pint beer.

March 3d.—With the exception of slight debility, there has been no sign of disease during the past week; now strong and able to return to duty, to which he is discharged. Diet, roast chop, with one pint beer daily since last report.

CASE X.—Private Philip Judge, 47th Regiment, age 21.—*April 7th, 1865.*—Was on guard on the 2d instant; continued in good health until the evening of the 5th, when he had a rigor, and suffered from sickness of stomach followed by pain in the right side of the chest, and slight cough; on the morning of

the 6th, he began to expectorate rust-coloured mucus, and was then admitted with symptoms of incipient pneumonia in the right lung; he had a purge and was given two doses of tartar emetic which caused vomiting; turpentine fomentations were applied twice in the day. This morning the pulse is 88 and full; resp 20; temperature 102°; very little air entering the base of the right lung; small crepitation audible as high as, and on a level with, the nipple, both in front and behind; expectoration very much tinged, small in quantity and very tenacious. To be bled to $\frac{3}{4}$ x., and to take ant. tart., gr. $\frac{1}{4}$, every third hour. Turpentine fomentations three times a-day. Diet, spoon, with lemonade.

8th.—Pulse 92; resp. 20; temperature 102°; pulse soft; air entering down to the base of the lung, where there is large crepitation behind; expectoration more copious, less tenacious, moderately tinged, and muco-purulent in character. Ant. tart., three times a-day. Turpentine fomentations as on yesterday. Diet, beef-tea, with lemonade.

9th.—At 10 A.M., pulse 88; expectoration tolerably fluid, and very little tinged; cough less troublesome; still slight pain at the lower part of the chest; air entering the lung freely down to the base where there is large crepitation with the sound of respiration. Antimony three times a-day; potassæ bicarb., gr. xv., three times a-day. Turpentine fomentations as on yesterday. Diet, beef-tea; omit the lemonade. At 5 P.M., pulse 84; resp. 24; temperature 101°.

10th.—Pulse 80; resp. 24; temperature 98°; less cough; expectoration very little tinged; large crepitation still audible at the base of the lung; duration of the sounds of expiration and inspiration nearly equal; skin moist; tongue very little furred; no thirst. Continue ant. tart. and potassæ bicarb. as on yesterday. Omit the fomentations. Diet, beef tea.

11th.—Pulse 80; resp. 22; temperature 100°; expectoration considerably more tinged, and less copious; air entering the lung, but not quite so freely as on yesterday; sonorous rales mixed up with large crepitation; considerable pain of the side on coughing or full inspiration. A large blister to be applied to the side; antimony and potash as on yesterday. Diet, beef-tea.

12th.—Pulse 76; resp. 28; temperature 100°; the blister acted well, and the pain has quite ceased; very little cough; expectoration fluid and much less tinged; skin moist; tongue slightly furred, but moist. Continue the remedies and diet as on yesterday.

13th.—Continues improving. Omit the antimony, but continue the potash. To have low diet to-morrow.

15th.—Free from pain; no cough; a little untinged expectoration yesterday; none to-day. Continue the potash. Diet, low.

19th.—Rapidly convalescing; no pain or cough; respiration at the base of the lung nearly natural; sound of expiration still slightly prolonged. Omit remedies. Roast-chop diet to-morrow.

30th.—Has progressed favourably since last report; now quite strong and able to return to duty, to which he is discharged.

The details of the ten cases above recorded will, I trust, enable the reader to form a very fair estimate of the total series; but my original intention was to have made such a selection from the whole as would have included characteristic examples of the cases of each year of the period embraced in this record. Loss of health in my family, however, made it suddenly necessary that I should at once return to England, and left no time for making the necessary extracts from the public records. Fortunately, however, I had, towards the end of 1864, begun a system of making duplicate notes of the records of cases of pneumonia which came under my care, and, in that way, I have now been enabled to give in detail

information which I hope may be found sufficient for the end in view.

The general deductions given at the beginning of this paper, are based on facts which were tabulated at the time each case occurred.

The following are the records of the three cases which terminated fatally; the two first in detail; the last in a condensed form.

FATAL CASE, No. I.—Private Francis M'Ardle, Army Hospital Corps, age 25; service, 7 years; station, Montreal, Canada East; time on the station, 8 months.—*March 12th*, 1862.—An Irishman; by trade a labourer; a stoutly-made man; was formerly in the 47th Regiment; and has done duty in the hospital of the corps for the last 3 years; was attacked, on the 8th instant, with rigor, which was followed, on the 10th, by pain in the right side of the chest, accompanied by cough and expectoration of rust-coloured sputa. When admitted into hospital, on the latter date, there was obscure crepitation at the base of the right lung. The pulse was 100; the breathing much hurried; and there was great thirst; he was cupped to about $\frac{3}{4}$ iv., and was given ant. tart., gr. $\frac{1}{4}$, with hydrarg. cum creta. gr. $\frac{1}{2}$, every third hour. Yesterday he was a good deal better, but the pulse was still high and the breathing hurried; the expectoration was copious, and of the same character as on the previous day; a blister was applied at bedtime, and the antimony continued as above. To-day he is free from pain; the breathing is nearly natural, and the pulse 96; the blister has acted well; the bowels are constipated. To have pulv. jalapæ co., \mathfrak{z} i., calomel, gr. ij; the antimony to be continued as before, after the purge has acted. Diet, spoon, with two pints lemonade.

14th.—There was an increase of fever yesterday morning, and the tongue became dry, whilst expectoration was more difficult, and the pulse rose to 108. He had ant. tart., gr. $\frac{1}{4}$, every hour up to about 3 P.M., when he became much under the influence of the drug, and had an attack of syncope after having been to the close-stool, his bowels having been freely acted upon by a purgative enema. Towards evening, he seemed a good deal better, his pulse having fallen in frequency, whilst, however, it lost strength from the action of the antimony: his tongue also had become moist. The antimony was discontinued, and \mathfrak{z} ij. of brandy in \mathfrak{z} ss. doses were given in water, in the course of the evening. He passed a restless night, and now complains of slight pain in the left side, where there is evidence of incipient pneumonia at the base of the lung. Pulse 108; resp. 28; tongue dry at the tip; sputa rusty and rather scanty; great thirst. A blister to be applied to the left side of the chest. To take pulv. Doveri, gr. viij., hyd. cum creta, gr. i., ant. tart. gr. $\frac{1}{8}$, three times a-day. Diet, spoon, with lemonade, and \mathfrak{z} ij. of brandy.

15th.—The blister has acted well, and he is quite free from pain. He suffers less from cough, and his breathing is much more quiet. He is now perspiring profusely, and seems on the whole considerably better, although his pulse is feeble, whilst it is at the same time less frequent than it was yesterday. The tongue is less furred, and is now moist. The strangury has ceased. To take the following three times a-day:— \mathfrak{R} Ammoniae sesquicarb., gr. v.; tinct. camph. co., \mathfrak{z} i.; spt. æth. nit., m. xx.; aquæ, \mathfrak{z} i.— \mathfrak{M} . Omit the powders. Diet, beef-tea; two pints lemonade; two ounces brandy.

16th.—There is this morning some distress of breathing, with pain across the chest. The pulse is 104, and inclined to be weak; and the tongue is slightly dry at the tip. There is some increase of dulness on percussion at the lower part of the left side of the chest, as well as an absence of the sound of respiration at the base of the lung. There is large crepitation, mixed with sonorous rales, at the lower part of the right side. The bowels are constipated. A purgative enema to be administered, and a mustard-plaster applied to the front of the chest. The mixture as above ordered, but omitting the tinct.

camph. co., to be given every third hour. The diet, lemonade and brandy, as above. Towards evening, distress of breathing came on attended with suppression of the expectoration. Pulse 120; face flushed. The brandy was omitted and the mixture discontinued.

17th.—After the stimulating treatment had been discontinued, last evening his condition improved, and he passed on the whole a tolerable night. There is less difficulty of breathing, and the pulse has fallen to 100. The tongue is moist, and the face less flushed. There is evidence of induration at the base of the left lung. The right is doing well. The following to be given every second hour:—*R.* Vin. ipecac., 3 ss.; potassæ bicarb., gr. xv.; infus. senegæ, ʒ i.—*M.* Diet, beef-tea, with two pints lemonade.

18th.—Is considerably better this morning. The pulse has fallen to 80, and is of moderate strength. There is no distress of breathing, and the cough is less troublesome, whilst expectoration is more free and less tinged. The tongue is moist, and but little furred. Percussion gives a clear sound over the base of the left lung, and large crepitation is audible there. Continue the mixture. The following to be given three times a-day:—*R.* Pulv. Doveri, gr. v.; hydrarg. cum creta, gr. ij.—*M.* Diet, beef-tea, with lemonade.

Vespere.—Has dozed a good deal in the course of the day. States that his gums are now tender. The tongue is slightly dry at the tip. Omit the powders. To have two ounces of brandy, at four times, in water, in the course of the evening.

19th.—About 2 A.M. his breathing became much distressed, and since then insensibility has gradually come on. His breathing is now very much hurried, and accompanied by occasional long convulsive inspirations. His countenance is dusky and his skin congested. His pulse is extremely feeble, and there has been an involuntary discharge of urine. The hair to be removed, a blister to be applied to the nape of the neck, and a mustard plaster to each calf. To have occasionally a little brandy and water, if he can swallow.

20th.—Remains in much the same condition as that reported yesterday. His countenance is dusky, and he can be only partially roused. His pulse is very frequent, extremely feeble, and somewhat intermittent. His teeth are covered with sordes. The blister has acted well, but he has not become more sensible. The discharges are passed in bed. A turpentine enema to be administered, and to take what stimulants and nourishment he can swallow.

21st.—From yesterday morning the powers of life gradually failed, and he expired in the way of coma at half-past eight the same evening.

Post-mortem examination fourteen hours after death.—There were tolerably strong pleuritic adhesions over the greater part of both lungs, but in a more marked degree on the right side; and in freeing the base and posterior part of the right lung, the tissue of it gave way under the hand. There was intense congestion of the base and lower and posterior half of the right lung, together with the condition of red hepatization at different spots in the same positions, but most marked in degree towards the base. There was intense congestion, but in a less degree at the base of the left lung, which was, however, free from hepatization. There was no tubercular deposit or other disease of either lung. There was slight adhesion of the pericardium to the heart, near its apex, and the disease seemed of recent date. The quantity or character of the pericardial fluid could not be ascertained, as it escaped through a cut accidentally made in removing the thoracic contents. The liver was much congested, and somewhat softened at the posterior part of the right lobe. The kidneys were also congested, and there was a slight trace of the incipient deposit of Bright's disease. There was no other apparent disease of the abdominal contents.

This case was the first which came under my care during my service in Canada, and I fear that I cannot look back with satisfaction to the course I adopted in treating it. The lesson, however, which its progress and result taught me was a valuable one, and I

believe that the details I have given respecting it will prove to be not without interest to others.

FATAL CASE, No. II.—Lance-corporal William Dickson, 47th Regiment; age 21; service $2\frac{1}{2}$ years; station, Kingston, Canada West; time in Canada, $2\frac{1}{2}$ years. *August 13th*, 1863.—This man was under treatment, at Montreal, for remittent fever, from the 24th September to the 20th October 1862. He is now admitted into hospital on account of general debility and pains in the back and limbs. His tongue is loaded, and his pulse slightly accelerated. There is no headache, but he feels heavy, and is much inclined to sleep. His appetite is bad, and he suffers from thirst. His bowels are tolerably regular. He had to-day a slight rigor followed by sweating. To have a common purgative dose with 5 grains of quinine in it. Diet, spoon, with two pints lemonade.

14th.—Passed a restless night, coughing much, and expectorates tenacious mucus, slightly tinged with blood; pulse 108; much thirst; tongue loaded. There are now undoubted signs of the first stage of pneumonia at the base of the right lung. Was well purged yesterday. To have turpentine fomentations to the side, and to take ant. tart., gr. $\frac{1}{4}$, every second hour. Diet and lemonade as on yesterday.

19th.—Has had well-marked pneumonia, which is now waning; crepitation still distinct; sputa less bloody and tenacious; pulse 95, rather weak. To have the following three times a-day:— \mathcal{R} Ant. tart., gr. $\frac{1}{4}$; tinct. camph. co., 3 ss. Liq. Ammoniae acet. 3 ss. Diet, beef-tea; two pints lemonade; two pints milk.

[Here my charge of the case ceased, and the following entries were made by the medical officer who relieved me.]

21st.—Respiration easy; pulse quiet and regular; slight cough. To have cough-mixture. Diet continued.

22d.—Much better; dislikes the lemonade. Diet continued; omit lemonade.

24th.—Not so well to-day. Breathing more difficult; dulness over the lower lobe of the right lung; general aspect unfavourable. To have ant. tart., gr. $\frac{1}{4}$; calomel, gr. j.; every second hour. Diet, low; two pints milk, one egg.

25th.—Seems a little better, but his respiration is still hurried. Continue treatment. Diet, beef-tea; one pint beer, four ounces wine, one egg, two pints milk.

26th.—Was very weak last night, but is rather better to-day. Continue powders every third hour. Diet, beef-tea; two ounces brandy, four ounces wine, two pints milk, one egg, one tin essence of beef.

27th.—Much better, but still very weak. Diet and extras as on yesterday.

28th.—Same as yesterday. Mouth not affected by the mercury. Continue powders every third hour. Diet and extras continued as above.

29th.—Not so well as on last night. Had some delirium during the night. Very thirsty. Continue powders. Diet, etc., as above.

31st.—Improving slowly. Much difficulty of respiration. Mouth not yet touched by the mercury. Diet, beef-tea; one egg, two pints milk, eight ounces wine, one tin essence of beef.

September 2d.—Not so well. Has had since diarrhoea. Checked. Omit the powders. Diet, etc., continued as above.

3d.—Looks very ill still, and has much dyspnoea. Very weak. Cough-mixture. Diet, etc., continued as above.

4th.—Rather better than on yesterday. Diet, etc., continued as above.

6th.—Worse. Dyspnoea increased. Omit the mixture. \mathcal{R} Spt. ammoniae aromat.; spt. ætheris comp., āā. m. x. Liniment—crotonis tigllii for chest. Diet, etc., continued as above.

7th.—Appears to be dying. Nil. Add two ounces brandy to the extras.

8th.—Died at 2 A.M. to-day.

Post-mortem appearances.—Chest: Right lung condensed, and nearly a quart of serum in the pleural cavity; a few slight recent adhesions, with soft

lymph deposited on the surface. The whole lung in an advanced state of grey hepatization. At the apex softening had commenced, and the tissues had broken down, forming several small cavities. This was also the case at one or two points at the base of the lung. In other parts it was solidified throughout its structure. Left lung crepitant and healthy, without any tubercular deposit. Heart rather large, structure firm, valves healthy. Abdomen: Liver somewhat enlarged, structure healthy. Stomach, intestines, spleen, and kidneys normal.

FATAL CASE, No. III.—Private John Allen, 47th Regiment; age 33; service, 15 years; station, Hamilton, Canada West; time in Canada, $3\frac{1}{2}$ years. Had been for several years past employed about the officers' mess; and, when attacked by his last illness, was acting as scullery-man to that establishment. His employment exposed him to considerable alternations of temperature, and he has been generally considered to be a man who regularly consumed a large quantity of drink. Some ten years ago, when serving at Corfu, he had an attack of pneumonia, for which he was bled at the arm; and again, at Cork, in 1860, he had a similar attack, for which he was under treatment for twenty-three days. On the night of the 1st instant (November 1864), he had a rigor, and soon afterwards began to suffer from cough, and pain in the right side of the chest.

He was admitted into hospital on the morning of the 2d, and then his breathing was short, and he was unable to make a full inspiration without suffering from acute pain in the right side. Crepitation could not be detected, but there was obscurity of the respiratory murmur over the lower part of the right lung, with some prolongation of the expiratory sound. Towards evening the expectoration became rust-coloured. He was ordered a purge; turpentine fomentations were applied to the side, and tartar emetic afterwards administered in gr. $\frac{1}{4}$ doses every second hour, until nausea supervened, and then less frequently.

On the morning of the 3d, the pulse was 108 and rather full; respiration 28. The breathing was more free, sputa copious but not coloured, and of considerable tenacity. Crepitation could not be distinctly made out, although air could be heard to enter the lung.

On the morning of the 4th, the pulse had fallen to 96 in frequency, and was soft and of good strength; respiration 28; expectoration not so much tinged, but rather more copious and of less tenacity. No sound of air entering the back part of the base of the right lung, but small crepitation near the lower part in front. Large crepitation near the spine, and on a rather lower level than that of the angle of the scapula. The antimony to be continued every third hour unless it caused much nausea, and also the turpentine fomentations.

On the 5th, the pulse had fallen to 80, and was soft and of good strength; respiration 24; expectoration copious, less deeply tinged, and more fluid; crepitation very distinct over the base of the lung. The antimony was given three times a-day, and the turpentine fomentations were applied the same number of times. In the course of the night of the 5th, he suffered a relapse without any assignable cause; and, on the morning of the 6th, his breathing was found to be considerably distressed; respiration 40, whilst the pulse was 104; the sputa were more tinged, and much more tenacious. The antimony was given more frequently, and the fomentations were continued. In the evening it was found that he had been much nauseated, and the strength of the pulse reduced, but without abatement of the violence of the symptoms. The pulse was 108, and the respiration 44. There was great distress of breathing; and, in order to relieve that, he was bled from the arm to eight ounces, with slight relief. There was bronchial respiration over parts of the lung on a level with the angle of the scapula, whilst no air entered the lung below that position. The blood drawn became to all appearance a solid mass of the "buffy coat." There was no sign of disease in the left lung.

He passed a restless night, and on the morning of the 7th he was still much

distressed. Respiration 44; pulse 120, but of good strength; slight lividity of the lips. The disease still seemed to be confined to the right lung, into which rather more air entered, with sound of coarse crepitation. The sputa were much tinged, less copious, and very tenacious. As it was evident that the greater part of the right lung had become incapable of action, and the left was embarrassed by the amount of blood thrown upon it, twelve ounces of blood were taken from the arm, and with the effect of affording very considerable relief. The countenance became clearer, there was much less distress of breathing, and in the course of the afternoon he had some sleep. In the evening he appeared considerably better. About 9 P.M. a blister was applied to the right side; he was then cheerful, and after that appeared to fall asleep, lying on the left side. About 10 P.M. it was observed that his breathing had become embarrassed; and when I saw him at 11 he was comatose, and could be only partially roused when stimulants were steadily administered, but without any permanent good effect; and he expired in the way of coma at 3 A.M. of the 8th.

Post-mortem examination fourteen hours after death.—Body muscular, and not emaciated. Marks of cupping and blistering of old standing on the right breast. The blister applied on the evening of the 7th had acted partially. Both lungs were firmly adherent to the walls of the chest, but especially the right, which could only be removed with great difficulty, owing to some recent and many old adhesions of great strength. The fore-part of the surface of the right lung was covered with a tough membrane of a yellow colour. With the exception of a small portion of the apex, and a part at the front of the base, the right lung was in the condition of red hepatization. It sank in water, and the larger divisions of the bronchi were filled with fibrinous casts, which retained their form on removal. The left lung was very much gorged with blood, its tubes loaded with mucus tinged with blood, but its tissue crepitated, and seemed throughout to be otherwise healthy. There was slight excentric hypertrophy of the left ventricle of the heart, but no valvular disease. The liver was considerably enlarged, and presented well-marked cirrhosis. The kidneys were of large size, and lobulated in form: one, which was laid open, presented incipient granular deposit of Bright's disease, and was much congested; the other was preserved whole.

The grand error committed in the management of this, the first serious case of the season, was the omission to bleed moderately at the outset of the disease. Had that course been adopted, there is every reason for believing that the favourable result which followed the employment of the remedy in question in so many cases of a similar nature would not have been wanting in this instance. Bloodletting was, however, subsequently made use of in this case, but at a stage of the disease when, hepatization having already taken place, there was no prospect that it could limit the advance of the complaint on the right side of the chest, although it might still, by relieving the engorged state of the left lung, assist in obviating the tendency to death by coma from mal-arterialization of the blood, which the condition of the lips and countenance showed to be imminent. I regret that the administration of wine was not commenced at this stage of the disease; but I must confess that I was not prepared for so early a fatal termination, although I became fully aware of the gravity of the attack from the time that the exacerbation of the symptoms and the sudden advance to hepatization took place. At the same time, however, whilst fully admitting the dangerous condition into which the case

had fallen, I cannot altogether divest myself of the suspicion that the sudden supervention of coma was to a considerable extent determined by the accident of the man having been allowed to fall asleep whilst resting on his left side,—a position which could scarcely fail, in the existing state of the right lung, so to impede the action of the left as to cause a degree of embarrassment of the respiration which would be likely soon to lead to an early termination, such as actually happened.

From a careful study of the facts observed in connexion with the whole series of cases of pneumonia which came under my notice, I have been led to draw the following general conclusions :—

1st, As regards the exciting causes to which the disease could be clearly traced, one of the most frequent was exposure when on guard, and more especially when on sentry at night during severe weather,—conditions which were also, in all probability, materially aggravated by the overcrowding and want of ventilation which, as a general rule, existed in the guard-rooms. Another cause, of frequent occurrence, was confinement in the guard-room when under the influence of drink ; as was also a want of sufficient care on the part of the men to avoid getting chilled, on their return to their barrack-rooms, when overheated and fatigued by a march into the country during the winter, or by a trying field-day at other seasons. Other cases, which could not so clearly be traced to their exciting cause, probably owed their origin to a certain amount of exposure during the depth of winter, which was inseparable from the daily routine of their barrack-life. In one instance, also, the disease came on after a severe fall causing slight concussion of the brain.

The time which elapsed between the date of exposure, where that could be clearly determined, and the occurrence of the rigor, was found to vary from a few hours to three or four days. In some of the cases recorded above will be found examples of the shorter periods, whilst the longer interval was well exemplified in the cases of four young and previously healthy men, who took part in a rather fatiguing field-day during warm weather in the month of June, and who were all attacked with pneumonia, which showed symptoms, mild in degree, but very characteristic of the disease. In one of the four, the complaint appeared on the third day, but in the other three it did not begin until the fourth. The man first attacked was under treatment for thirteen, two of the others each for eleven, and the fourth for ten days, the mildness of the weather having, in these, as in other instances, determined the degree of severity of the attack—it having been almost invariably found, that the rapidity with which an attack came on, bore a close ratio to the intensity of the exciting cause, which latter also determined the degree of violence of the attack.

2d, The earliest observed stethoscopic indication of the existence of the disease was a decided obscurity of the sounds of respiration,

accompanied by some degree of alteration of the relative proportions of the inspiratory and expiratory murmurs—the latter having become prolonged, whilst the former was shortened—less so, however, with the first indications of a change from health, but increasing, as the period of the setting in of crepitation approached, until but little of the inspiratory sound could be distinguished, and that of expiration became not only prolonged as to duration, but exaggerated in tone, so as to bear a close resemblance to bronchial breathing, of which it was probably the first degré. This did not, however, depend on actual consolidation, but was owing in all probability to that amount of increased density of structure which was the result of great engorgement of the vascular tissues, and, perhaps, in some measure also to fluid effusion into air-cells as well. In the earlier stage of the obscured respiratory sound, its tone was somewhat altered, by having become less soft in character; but it was not until the stage of crepitation in its first degree approached that the expiratory part of it became exaggerated, to be afterwards, in many cases, for a few hours lost altogether during ordinary respiration, although evidence that air entered the diseased portion of the lung could still be heard during forced respiration. This obscurity of respiration was first noticed by me in 1862, during my examinations of the earlier cases of pneumonia which came under my care; and, in the whole course of my subsequent experience, although often not recorded, this condition was never found wanting when carefully searched for. The alteration of the relative proportions of the respiratory sounds, which attended this state of the breathing, showed that it depended on commencing engorgement of the lung tissues affected in pneumonia; that condition progressing in intensity, as indicated by the change of character of the expiratory sound until the acme of engorgement—without, however, actual consolidation—was reached, as shown by the fact, that but little air then entered the diseased portion of lung during ordinary respiration. To this highest degree of engorgement, in acute cases treated at the outset by bloodletting, and in mild or asthenic ones where the progress of the disease was favourable to recovery without hepatization, relief was, however, soon afforded, by the setting in of secretion as manifested by crepitation, small at first, but gradually becoming of a less fine character, as the lessening engorgement allowed the smaller ramifications of the bronchial tubes to regain more of their natural capacity.

The stage of engorgement in its various degrees generally lasted to near the end of the first or beginning of the second day of the disease. Then, with or without a short interval of absence of respiratory sound, small crepitation set in; and, in sthenic cases early bled, and where everything was favourable, lasted probably for twenty-four hours more, when large crepitation could be heard over part of the lung. This generally happened towards the end of the third, or in the course of the fourth day of the disease. Judging

by the rate of the pulse, taken in conjunction with recorded observations of the temperature of the body, the period at which the accompanying fever attained its greatest height, corresponded with the acme of engorgement and the duration of small crepitation. It gradually abated, however, on the occurrence of large crepitation in such sthenic cases as had been efficiently treated, and the disease then steadily abated without hepatization having occurred at all. For a few days, however, after the cough and expectoration had entirely ceased, large crepitation could be heard at the base of the lung, chiefly during expiration. The evidence of disease, which could be last distinguished, immediately before the return of natural respiration, was some prolongation and roughening of the sound of expiration.

3d, Facts which have come under my own observation, and which are to my mind conclusive, have forced upon me the conviction, that the assertion which has been so confidently maintained to the effect,—1st, That a pneumonia cannot exist and recover without having passed through all its stages, short of gangrene, but up to that of suppuration or gray hepatization; and, 2d, That it implies ignorance of the true pathology of the disease, either to attempt to interfere with the progress of that course, or to believe that bloodletting can act in any other way than to impede what is looked upon as the natural process of recovery;—is true only as regards certain classes of cases, and is not borne out by facts in respect of the disease in general. All my experience of pneumonia leads me to conclude, that the natural course of a sthenic attack of that disease, induced by an exciting cause acting with a high degree of intensity, and treated by bloodletting at the outset of the disease, is in strict accordance with the succession of changes which I have already described in treating of the stethoscopic signs and progress of the complaint.

A perusal of the cases of recovery given above will show the grounds on which the observations I have just made are based, and will explain the characters which I believe to be usual in that acute and sthenic form of attack which should, in my opinion, be considered typical of pneumonia. When, however, an attack originally such as that above referred to is allowed to run its course, without adequate treatment, its tendency is to a fatal termination, which will in all probability happen before more than perhaps a small portion of only one lung has reached the stage of red hepatization. Fatal case No. 1, recorded above, is an example of the disease terminating in this way. In cases, however, which are asthenic from the beginning, or which have been induced by exciting causes acting with moderate intensity, as is generally the case in the summer and autumn months in Canada, and during most seasons of the year in the more temperate climate of Great Britain, as well as in those attacks in the treatment of which it may not have been considered necessary to employ bloodletting, recovery may in a

large proportion of instances be satisfactory, provided they have been early brought under intelligent medical treatment, and that, too, without hepatization ever having occurred. Case No. 9, given above, is a fair example of an asthenic pneumonia occurring in a weakly man, and running its course in the manner which has just been indicated. A proportion of such cases, however, will, without assignable cause, or the existence of any very apparent difference in character from other attacks to all appearance identical with them, run on to hepatization—that stage coming on either gradually or by a sudden exacerbation of symptoms after apparent temporary amendment—and require a lengthened period of treatment for their cure. Cases of this description may also terminate fatally, but then, in comparison with what is observed in sthenic attacks having a similar result, there will be a very marked difference in the rapidity with which they will have run their course, which may not close in death until after the lapse of several weeks. In cases of this description, examination of the body after death will disclose a large portion of lung in the condition of grey hepatization, which may even have gone on to the formation of abscess, as happened in the second fatal case recorded above.

A considerable number of cases of a nature similar to those last described, with the exception that they all recovered, came under my notice in the season of 1863, when from a local cause the complaint was less sthenic in form, and when also, for a reason already given, bloodletting was less frequently had recourse to in its treatment. Of this nature, also, I believe that the majority of the cases of pneumonia treated in civil hospitals in this country partake; and from all I can learn on that subject, I am induced to suspect that a very considerable proportion of those cases are not brought under medical treatment until the stage of hepatization has probably set in.

4th, As will have been inferred from what has already been mentioned in the course of this paper, I have arrived at the conclusion, founded on facts, which I do not think can well be misinterpreted, that contrary to what has been asserted on this point also, variations in the nature and intensity of the exciting cause, as well as the influence of changes in climate, in atmospheric conditions, and in locality, affect, in a marked degree, the form or type in which pneumonia may occur. This was in no way more clearly made apparent than by the modifications of the disease, caused in the course of a single year in Canada, by the variations of a temperature ranging from -35° in the open air to 100° in the shade: the extreme cold of winter producing attacks of pneumonia which were severe in form and rapid in accession in direct proportion to the severity of the exciting cause; whilst, on the other hand, the milder temperature of summer and autumn led to attacks which were slow in accession and correspondingly slight in degree.

5th, My experience of the effects of bloodletting convinced me

that its employment at the outset of pneumonia in its sthenic form was attended with most beneficial results, not only in shortening the duration of the disease, and rendering convalescence satisfactory, but also in giving an amount of certainty and uniformity to the results of treatment which could not be attained by the employment of any other combination of remedies. As to its power in "cutting short" the disease—if by this term is meant to be expressed the probability of its at once arresting, and as it were stamping it out—my own experience would go to show that its employment is not attended with any such result. In proof of this I may mention that so soon as I became aware of the import of the condition of the respiration, which is first observed at the outset of pneumonia, I attempted, by early bleeding before the disease had advanced beyond the stage indicated by obscurity of the respiratory sounds, to arrest it in that of engorgement. In no case, however, was this practice attended with the result desired; but, on the contrary, in every attack so treated, instead of being altogether prevented, small crepitation seemed to undergo an earlier development,—an occurrence which may perhaps be held as in some measure bearing out the accuracy of the views I have expressed as to the nature of the early stage of the disease in sthenic attacks. The subsequent progress of all such cases early bled was otherwise invariably satisfactory.

I would still, however, feel inclined to consider this question in the light of an open one, and to believe, until distinct proof to the contrary shall have been produced, that bloodletting practised soon after the occurrence of the rigor may possibly at once arrest the disease. I am the more inclined to this view of the matter, because Dr Jameson, my colleague in the 47th Regiment, informs me, that in one case which he bled freely immediately on the man's admission into hospital, and within a very short time of the occurrence of an attack of rigor which, from all the attending circumstances, and happening as it did at a time when pneumonia was prevalent among the men of the corps, appeared to be the initial symptom of an attack of that disease, no further indisposition followed. This may or may not have been a case which, if it had not been so treated, would have proved one of pneumonia; but still I believe the fact is worth recording.

A perusal of the records of cases which I have given above will show I think, upon the whole, with considerable clearness, that it was by limiting the stage to which the diseased action advanced, rather than by affecting the extent of lung to be attacked, that bloodletting manifested its power to shorten the duration of the disease. That it also influenced the amount of lung attacked, however, appears evident, from what was found to have happened in some of the fatal cases, neither of which were bled at the outset of the disease. It may be here stated, with regard to the extent of lung affected in cases early bled, that it amounted, as a general

rule, to from one-half to three-fourths; and that in respect of the part first attacked, in no instance did the disease begin at the apex.

After having most carefully watched the whole course of the disease in attacks where bloodletting was employed at the outset, I feel satisfied that in no case so treated did red hepatization take place; both the exaggerated respiratory sound heard near the acme of engorgement, as well as the absence of evidence of the entrance of air, excepting during forced respiration, which frequently for a few hours preceded the setting in of small crepitation, having been, as already so often stated, unconnected with any degree of actual consolidation. Neither were the bronchitic sonorous râles occasionally audible along with large and small crepitation near the middle of the lung, in the course of some of the cases, confounded with the blowing sound of bronchial respiration heard when true hepatization was present. The facts of greatest importance, however, noticed with reference to the employment of bloodletting, were the rapidity with which such cases recovered in proportion to the severity of the attacks, and the uniformity of the results observed on a review of the whole cases so treated, as compared with that obtained in the milder and more asthenic attacks in which bloodletting was not made use of. This has been shown by the tabular statements given at an earlier part of the paper.

A further consideration, possessing also considerable practical importance, is the fact, that in cases not bled it was found that there existed, throughout the greater part of the attack, a danger that a fresh accession of fever, and a rapid advance to hepatization, might not only suddenly occur, but do so at a period of the disease when good results from bloodletting, if it should then be employed, were but little likely to be obtained. In conclusion, I would, however, beg that it may be distinctly understood, that whilst advocating the employment of bloodletting at the outset of sthenic cases of pneumonia, such as are seen in young and previously healthy soldiers, and whilst maintaining also from actual observation that the good results which follow such a mode of treatment surpass in a marked degree those obtained from any other combination of remedies, I do not in any way call in question the value of that mode of treatment termed "restorative," as applied to a particular class of cases, and which has been employed with so much success in the management of the pneumonia seen in civil hospitals in Britain.

It would appear, however, from such limited details as have been given of the cases, on the results obtained in which this plan of treatment has been based, not only that the attacks were of an asthenic character, but it may also be inferred that, in a large proportion of instances, the disease had advanced to the stage of actual consolidation before it was brought under medical treatment at all. On this supposition, therefore, these were cases in which bloodletting would

in all probability have been inadmissible, but they were exactly such as would derive benefit from the description of treatment in question. My own experience of pneumonia would, accordingly, lead me to conclude that it is only in such asthenic cases as those above referred to, modified as they must be by the minor degree of intensity of their exciting cause, as it prevails in a climate equable on the whole as that of Britain is, and influenced also as they cannot fail to be by conditions of food, clothing, locality, and occupation, that this plan of treatment can be advantageously employed.

In sthenic cases, such as came under my own observation in Canada, and of which it is possible that examples may occasionally be met with at home, facts have convinced me that a restorative plan of treatment could not be exclusively employed without the risk of at least a considerable mortality, or at all events the almost certainty of a recovery protracted beyond what it would have been had bloodletting been made use of. I would further add, that what I have learned in the course of this inquiry induces me to believe that much of the confusion and diversity of opinion which have of late years arisen on the subject of the pathology and treatment of pneumonia has been the result of a somewhat restricted view of the extent of the field of inquiry embraced by the subject under investigation, and the too resolute belief, not only that the asthenic pneumonia, which has of late years supplied the larger proportion of the cases met with in this country, is the sole form in which inflammation of the lungs prevails now, but is even the only type in which that disease has existed at any previous period. I must at the same time beg to be pardoned if I venture also to hint my suspicion that some portion of this state of opinion may likewise be due to the condition of the lungs which exists during the highest state of engorgement having been confounded with that state of actual hepatization the occurrence of which renders it absolutely essential for the cure of the disease that the next highest stage—that of suppuration or grey hepatization—should also follow.

I would now close this paper with the expression of a sincere hope that the facts, with the conclusions deduced from them, which I have endeavoured to record, may prove suggestive to other inquirers; and that they may also, perhaps, be the means of inducing my fellow-labourers in the public service to enter upon an inquiry for the prosecution of which they enjoy advantages that do not often fall within the reach of their brethren in civil life.

