

intricacies of the disease," we can see how entirely consistent is the pathological theory with the results of opposite modes of treatment.

AN EPIDEMIC OF PNEUMONIA OCCURRING AT PESHAWAR.

By JOHN STEPHENSON, B Sc., M.B. LOND.,
SURGEON-LIEUTENANT, I.M.S.

DURING the months of December, 1895, and January and February, 1896, an epidemic of pneumonia occurred amongst the men of the 1st Bengal Infantry stationed at Peshawar. I was attached to the regiment at the time and had opportunities of observing all the cases. The following is a short account of the epidemic, the particulars having been as far as possible thrown into tabular form.

There were 34 cases of acute lobar pneumonia with 19 deaths. These occurred during the two months comprised between the middle of December and the middle of February; the first case was admitted on Dec. 17th and the last on Feb. 9th. The regiment left for Jhansi on Feb. 20th, but the epidemic was over by that time, no cases having been received into hospital for eleven days previously. Taking weekly periods the admissions and deaths may be arranged as follows:—

—	Admissions.	Deaths.
From Dec. 15th to Dec. 21st	2	0
„ „ 22nd „ „ 28th	2	0
„ „ 29th „ „ Jan. 4th	4	3
„ „ Jan. 5th „ „ 11th	7	2
„ „ 12th „ „ 18th	10	6
„ „ 19th „ „ 25th	3	3
„ „ 26th „ „ Feb. 1st	3	3
„ „ Feb. 2nd „ „ 8th	2	0
„ „ 9th „ „ 15th	1	2
Total	34	19

Thus the epidemic was at its height in the week Jan. 12th to 18th; of the 10 admissions, 8 came in on the 15th, 16th, and 17th, and 3 of the 6 deaths occurred on the 14th. The earlier part of the epidemic was the most fatal; of the 15 cases that came in up to Jan. 11th 11 died; of the 19 that came in after Jan. 11th 8 died. Taking the average strength of the regiment during this time at Peshawar to be the number of men present on Jan. 17th (about the middle of the epidemic), when there were 573 men in the lines, the proportion affected was 5.9 per cent. Of the 34 cases 19 died, or 56 per cent. With regard to the localisation of the disease, of the 34 cases 2 were left apical, of which 2 died, or 100 per cent.; 17 were left basal, of which 8 died, or 47 per cent.; 10 were right basal, of which 5 died, or 50 per cent.; and 5 were double basal, of which 4 died, or 80 per cent. As to the mode of onset, 6 men came to hospital with the disease already developed. Commonly, however, the men developed physical signs of pneumonia a few days (from one to eight) after being admitted; this was the case in 25 instances. The remaining 3 cases were affected with pneumonia after being in hospital thirty, thirty, and thirty-five days respectively, during which time they were being treated for other diseases—2 for ague and 1 for abrasion and consequent erysipelas. Of the 25 who developed pneumonia after being in hospital a few days 3 did so after one day, 3 after two days, 4 after three days, 5 after four days, 3 after five days, 5 after six days, none after seven days, and 2 after eight days. The average time was thus four days. In the cases which recovered, since the temperature as a rule fell by a long lysis, the duration of the disease could not be fixed exactly. The acute symptoms lasted in all cases a week, sometimes ten days, and rarely even a fortnight, before any distinct improvement was manifest. Of the cases that died, 15 out of the 19 died within five days of the onset of pneumonia, and 4 at longer intervals up to fourteen days.

Most of the cases presented a definite and somewhat peculiar type of the disease, different in many respects from that usually seen in England. A sepoy would come to

hospital in the morning complaining of slight fever, pain in the chest, and a hard, dry cough; he usually said he felt weak and unfit for duty. On examination nothing abnormal would be found in the chest, and the temperature would range from 99° to 101° F., rarely 102°. Such a case was admitted and a stimulant expectorant mixture given. A large number of such cases recovered in a few days and went back to the lines; others, however, after an interval presented symptoms and signs of pneumonia. In such a case, after remaining in the above condition for four or five days, the cough and pain would become worse and an examination would reveal the ordinary signs of pneumonia. Sometimes, however, either the dulness or the bronchial breathing was not well marked, and the signs were fully developed only on the day following. Sometimes the signs continued indefinite for more than one day. The patient now very rapidly became extremely prostrate; delirium came on, first at night, then both by day and night. Often he would be apathetic, sometimes violent, and sometimes in a state of stupor, passing fæces in the bed. The temperature was as a rule not high—from 100° to 101° or 102°; sometimes irregular, and sometimes with distinct and regular morning remissions. Either death occurred at the end of a few days, usually from two to five, or after a week of this condition the temperature fell by a long lysis, leaving the patient very weak and exhausted. Convalescence was long, cases being kept in hospital as a rule from four to five weeks before being able to travel on sick leave.

The early physical signs noted in chests which subsequently (as a rule a day after) showed typical pneumonia were: (a) harsh breathing at the apex of the lung the base of which was afterwards consolidated, (b) indistinct bronchial breathing without dulness over the base afterwards affected, and (c) distinct bronchial expiration, with fine crepitations and no dulness, over the area which afterwards showed the typical signs. Of the 34 cases 5 showed no mental change, 3 were either apathetic or unconscious only, and the remaining 26 were at some time delirious. Four were violent or very violent, and 5 patients passed fæces in bed. As to the time of onset of the delirium, in 7 cases it appeared before the pneumonia, in 4 cases it appeared with it or the day after, in 9 cases it appeared two days after, and in 6 cases it appeared at a later period. Hence the large majority were cases of early delirium. As to prognosis, of the 26 who were delirious, 13 died and 13 recovered; of the 5 who showed no mental change, 3 died and 2 recovered; and of the 3 who showed apathy or stupor, only 2 died and 1 recovered. Early delirium was not more unfavourable than late. Thus, on the whole, delirium was of no account as a factor in prognosis. As a rule the temperature was not high: it often oscillated for many days on each side of 100°. There were no cases of hyperpyrexia, and the highest reached in any case was 104.2°. In half the cases the highest point reached was between 102° and 103°; in 9 it reached at one time or other a point between 103° and 104°. As to the character of the temperature, all kinds were exhibited. In 2 cases it was absolutely intermittent; several were regularly remittent, the difference between morning and evening temperatures being about 1°, thus showing a chart like that of an ordinary pneumonia in England; others showed larger remissions, as much as 3°, and approached the intermittent type. But in 15 cases there was no type at all, and these must be described as irregular; 4 of them might be called very irregular. In one case the first few days showed the characters of the typhoid fever chart.

With regard to defervescence, there was not one typical crisis, though in 1 case a sort of attempt was made, the temperature falling 2° in twenty-four hours. In 2 cases there was a pseudo-crisis followed by lysis; in 3 cases there was a short lysis taking only two days; but in all the rest the temperature fell very gradually. A distinct connexion can be traced between height of temperature and mortality. All the higher temperatures were fatal; only 1 recovered whose temperature at any time went above 103°. As to the character of temperature the two intermittents died; beyond this no connexion can be made out.

Three of the cases were in hospital when the pneumonia commenced, and had been under treatment thirty, thirty, and thirty-five days respectively. The first of these came in with ague, which began in the usual way; the fever, however, never went away, and after twenty-five days the temperature became higher, pneumonia subsequently developing. The second was also in hospital for ague, he had a relapse after

cooking his food when naked on the twenty-fifth day after admission, chest symptoms developed, and pneumonia was found on the thirtieth day. The third was in for a slight abrasion of the foot which prevented him from attending parades; this was followed by erysipelas and then by abscess formation; he began to go downhill rapidly, discharges came from his eyes and ears, and a few days before his death pneumonia was found on examination of the chest. In these cases, however, the pneumonia was a complication of a pre-existing disease. The only conditions which complicated a primary pneumonia were pleurisy (distinct physical signs on one occasion only) and diarrhoea (in one patient who died).

The epidemic lasted for two months in the coldest part of the year. It was most intense at the middle of this period, while the earlier part of the epidemic was the more fatal. The general mortality was 56 per cent.; about 6 per cent. of the regiment had the disease. The commonest form was left basal; the mortality of this form was the least. The majority of cases developed pneumonia after being in hospital a few days, during which time they had slight fever unaccompanied by urgent symptoms. In cases that recovered acute symptoms lasted a week or ten days; in the fatal cases death occurred as a rule within five days of the onset of acute symptoms. The epidemic was characterised by the extreme prostration of the cases, the very common occurrence of delirium, which usually came on early, the general lowness of the temperature, the variations in type of temperature met with, the large number of cases in which it was quite irregular, following no type at all, the general defervescence by a long lysis, the long convalescence, and the rarity of complications.

With regard to the etiology of the disease there were appearances at one time of its spread by contagion. Thus the suddenness and severity of the epidemic, and especially the so frequent development of the disease a few days after admission, led us to consider whether infection might not be a factor of the etiology. It appeared almost as if the hospital wards themselves might be harbouring and diffusing the causal micro-organism. Many men were taken from the lines to act as sick attendants, and several of these men were taken into hospital suffering in the same way. Thus a Christian bandsman was being nursed by another Christian, who contracted pneumonia and was also given a Christian attendant; the latter also became ill with pneumonia. This appeared to be a passing on of the infection from the first to the second, and from the second to the third. However, on examining the statistics it was found that in reality the sick attendants were no more frequently affected than the regiment generally. Ninety-five men acted as sick attendants at various times. Of these 11 were admitted into hospital; 5 had pneumonia, the other 6 had not, but suffered from the same kind of short febrile attacks which affected so many of the regiment, and on which, in the majority of cases, the pneumonia appeared to supervene. Thus 5.26 per cent. of the sick attendants contracted pneumonia, the ratio for the whole regiment, as was mentioned, being 5.9 per cent. Had there been any element of infection it is only reasonable to suppose that the men who were exposed to it most constantly and in a more concentrated form should have been attacked more frequently, instead of less frequently, than the regiment generally. It was thought that the men might be going through an epidemic of influenza and that the occurrence of pneumonia might be a complication of this primary disease. Several points are in favour of this view: first, the usual presence of preliminary symptoms—slight fever and cough; secondly, the extreme prostration which accompanied the disease; thirdly, the fact that a number of cases which presented the preliminary symptoms were admitted into hospital and recovered, as a rule, within a week, never developing pneumonia at all; and, fourthly, there was said to be just before the outbreak of this epidemic an epidemic of influenza at Rawal Pindi, eighty miles away, and in Peshawar itself a number of the English population had also suffered from "influenza."

With regard to the first point, it is difficult of explanation if we reject the influenza hypothesis. We might suppose that the pneumonia was central, beginning within the lung substance near the root and slowly extending to the periphery; but it is unlikely that so large a number of cases would present this particular and rare form of the disease. Moreover, the rusty sputa, shallow, quick breathing, and rapid and feeble pulse came on only with the development of the physical signs, and therefore it appears improbable that pneumonia could be existing, even centrally, in the stage of

the "preliminary symptoms." It must be conceded that influenza is the most probable explanation of this peculiarity of the cases. Nervous and muscular prostration are well-recognised features of influenza, and in this epidemic were also constant accompaniments of the pneumonia. If, however, we look for confirmation in the direction of the other symptoms of influenza we find very little help. The temperature in the majority of cases was very little raised, even at the first onset; there was never noticed any catarrh of the upper air passages, no running from the nose and no watering of the eyes; the general pains about the body, in the limbs, joints, pelvis, back, behind the eyes or in the head were seldom mentioned and never urgent. Pain in the chest was, however, a frequent complaint, nearly always made on first coming to hospital, before the development of the pneumonia. Except anorexia in a few cases, and one case of diarrhoea, there were no gastro-intestinal symptoms. There was never noticed any subsequent paralysis.

It must be mentioned that the cases of an apparently similar nature taken into hospital during the same period, which developed no pneumonia, did not invariably recover. One or two died with alarming suddenness the day after admission, apparently from sudden cardiac failure. Several lay in hospital for a long time in a state of extreme prostration, requiring one or two sick attendants; one who, like some of the pneumonia cases, was violently delirious required four. Something must, however, be said against the hypothesis of influenza. Whilst there were three other native regiments in Peshawar at the time, this was the only one that suffered in such a degree. About the time of the beginning of the epidemic there were several deaths from pneumonia in another regiment; but this did not last long, and later the same regiment had only 5 cases in hospital from all causes. Another had an average of about 12 sick, while in the 1st the daily number of sick during this time was 40, 50, 60, and 70. Thus the sickness among native troops was largely confined to the 1st Bengal Infantry. The detachment at Fort Jumrood sent back several cases to hospital; the cavalry detachment there remained healthy. Influenza has been styled "pandemic": it affects all classes over a large area of country and does not, as the present epidemic did, pick out one set of men only. Again, the regiment suffered a similar epidemic of pneumonia when they were in Peshawar last, about sixteen years ago. I have no records of this, but the accounts seem to show that it was at least of equal, if not greater, severity. At that time I suppose there was no question of influenza.

The foregoing remarks lead to a consideration of the third hypothesis as to causation. The regiment is one of the few composed practically entirely of Brahmans, and the men are more particular than even the generality of sepoys in their customs and observances. They are required to cook and eat their food when naked, and each man cooks his own; it was with difficulty that they could be got to disregard these customs even when seriously ill in hospital. They wash their hands and legs after going to the latrine; I have seen them doing this almost naked, with only a short shirt on. Their daily bath is taken outside even on cold, raw, and wet mornings. Moreover, they are down-country men, and the winter climate of Peshawar is much more severe than the winters they are accustomed to. The carrying out of the customs mentioned would therefore be more dangerous here than in their own part of the country. In one case at least the influence of exposure could be traced; the patient was admitted for ague on Dec. 11th; when convalescent he one day cooked his food when naked. This was on Jan. 5th; pneumonia supervened on Jan. 10th and he died on Jan. 14th. Here, too, the usual period of five days before pneumonic signs appear is seen. Whether, however, the epidemic as a whole is to be attributed to influenza, or to cold and exposure, or to both causes, can perhaps not be definitely decided. I have to thank Surgeon-Major Cretin, I.M.S., in medical charge of the regiment, for his kind permission to use the cases on which this paper is founded.

HOME FOR GENTLEWOMEN, WOODHALL SPA.—At Woodhall Spa there was established last year a home for gentlewomen of limited means needing the special treatment at Woodhall who otherwise would not be able to avail themselves of the valuable properties of that water. The terms are put at the lowest figure possible—viz., 12s. 6d. per week for board and lodging, including medical supervision, which is given gratuitously.