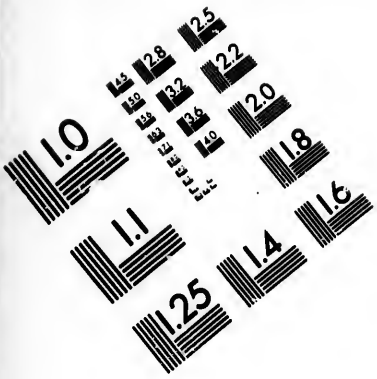


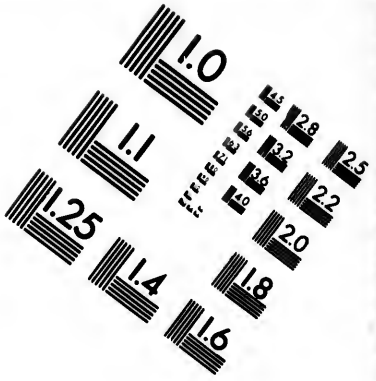
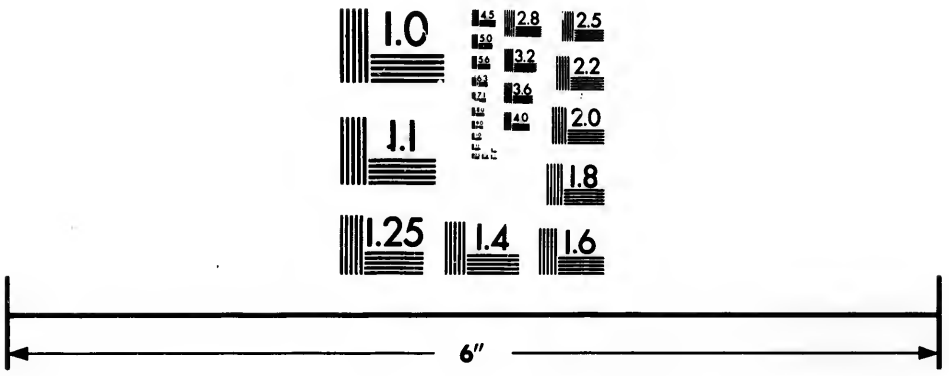
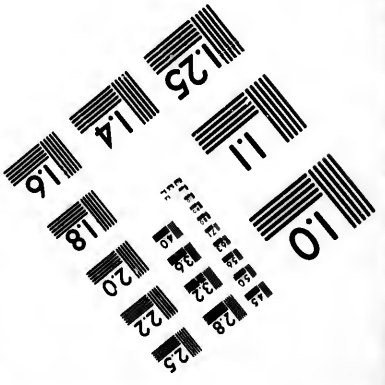


IMAGE EVALUATION TEST TARGET (MT-3)





Photographic Sciences Corporation

23 WEST MAIN STREET
WEBSTER, N.Y. 14580
(716) 872-4503

Technical and Bibliographic Notes/Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- ☐ Coloured covers/ Couverture de couleur
- ☐ Covers damaged/ Couverture endommagée
- ☐ Covers restored and/or laminated/ Couverture restaurée et/ou pelliculée
- ☐ Cover title missing/ Le titre de couverture manque
- ☐ Coloured maps/ Cartes géographiques en couleur
- ☐ Coloured ink (i.e. other than blue or black)/ Encre de couleur (i.e. autre que bleue ou noire)
- ☐ Coloured plates and/or illustrations/ Planches et/ou illustrations en couleur
- ☐ Bound with other material/ Relié avec d'autres documents
- ☐ Tight binding may cause shadows or distortion along interior margin/ La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure
- ☐ Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/ Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.
- ☐ Additional comments:/ Commentaires supplémentaires:

- ☐ Coloured pages/ Pages de couleur
- ☐ Pages damaged/ Pages endommagées
- ☐ Pages restored and/or laminated/ Pages restaurées et/ou pelliculées
- ☑ Pages discoloured, stained or foxed/ Pages décolorées, tachetées ou piquées
- ☐ Pages detached/ Pages détachées
- ☑ Showthrough/ Transparence
- ☐ Quality of print varies/ Qualité inégale de l'impression
- ☐ Includes supplementary material/ Comprend du matériel supplémentaire
- ☐ Only edition available/ Seule édition disponible
- ☐ Pages wholly or partially obscured by errata slips, tissues, etc., have been refilmed to ensure the best possible image/ Les pages totalement ou partiellement obscurcies par un feuillet d'errata, une pelure, etc., ont été filmées à nouveau de façon à obtenir la meilleure image possible.

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	12X	14X	16X	18X	20X	22X	24X	26X	28X	30X	32X
					✓						

The copy filmed here has been reproduced thanks to the generosity of:

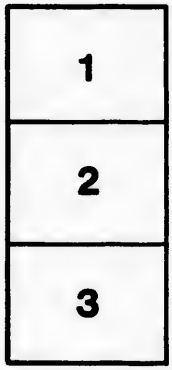
Medical Library
McGill University
Montreal

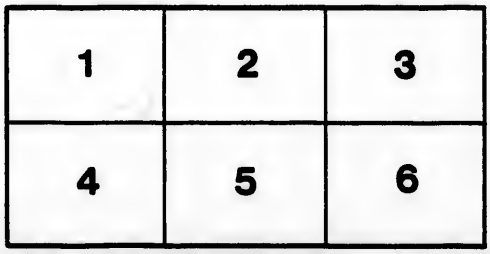
The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shall contain the symbol → (meaning "CONTINUED"), or the symbol ▽ (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagrams illustrate the method:





L'exemplaire filmé fut reproduit grâce à la générosité de:

Medical Library
McGill University
Montreal

Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et en terminant soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et en terminant par la dernière page qui comporte une telle empreinte.

Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole → signifie "A SUIVRE", le symbole ▽ signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.

CASES OF

GUNSHOT WOUNDS OF THE CHEST

BY

JAMES BELL, M.D.,

Surgeon-Major in charge of Field Hospital with General Sir Fred. Middleton's Division, North-West Field Force; Surgeon to the Montreal General Hospital.

Reprinted from the Canada Medical and Surgical Journal.

RE-PRINTED FROM THE "CANADA MEDICAL & SURGICAL JOURNAL,"
AUGUST, 1886.

CASES OF GUNSHOT WOUNDS OF THE CHEST.

By JAMES BELL, M.D.,

Surgeon-Major in charge of Field Hospital with General Sir Fred. Middleton's Division, North-West Field Force; Surgeon to the Montreal General Hospital.

(*Read before the Medico-Chirurgical Society of Montreal.*)

CASE I.—*Penetrating Wound of Lung; Gangrene; Recovery.*

Corporal J. E. L., 90th Battalion, aged 24, was wounded at the Fish Creek fight on the 24th of April, 1885. He was shot in the chest while lying facing the ravine in which the enemy were concealed, at a distance of about one hundred yards from him. The bullet passed through the second left costal cartilage, beneath the sternum, downwards and outwards towards the right side, making its exit through the 7th rib in the mid-axillary line. Before being removed from the field he also received a flesh wound over the right trochanter major, which, although not in itself serious, added greatly to his sufferings on the journey to Saskatoon and subsequently. He, with the other wounded from Fish Creek, arrived in Saskatoon on the 2nd of May, having been driven forty-five miles in a lumber waggon over the "trail." The period of seven or eight days intervening between the time of his injury and his arrival at Saskatoon was one of very great hardship to a man in his condition. The weather was cold, especially at night, and windy, and a considerable part of the time wet; their only shelter was the ordinary "bell" tent, and there were neither the materials nor the facilities for making warm and soothing applications to the chest, nor was there any

suitable invalid diet. On arrival at Saskatoon, his condition was very bad indeed. The greater part of the right lung was consolidated, and his breathing painful and rapid. There was also high fever and troublesome diarrhœa. Empyema followed, and on the 8th of May Deputy-Surgeon-General Roddick enlarged the wound in the right axillary region, evacuating a quantity of pus which was very fœtid. The pleural cavity was then washed out daily with antiseptic solutions (carbolic, alcoholic and boracic at different periods); and from time to time portions of gangrenous lung tissue presented at the wound and were removed. In spite of these precautions, however, he continued to suffer from high fever, perspirations, fœtid discharge, and great weakness. On the 23rd of May, with the advice and assistance of Dr. Roddick, I attempted to make a dependent opening. The patient was etherized and an incision made in the eighth intercostal space, posteriorly. On reaching the pleura, however, the lung was found to be firmly adherent to the chest wall at this point. The wound was therefore closed and the original axillary wound enlarged, and the cavity explored with the finger and long probes. A considerable amount of sloughy tissue was found lying unattached in the cavity, and was removed. The cavity was then emptied as well as possible, and washed out with weak carbolic lotion. On introducing the finger into the cavity, it was found to be as large as a large-sized orange, and surrounded on all sides by pulmonary tissue. It was an intra-pulmonary cavity, and not, as we had supposed, a localized pleural sac. As he recovered from the ether, he was seized with a severe and prolonged fit of coughing, in which he expectorated pus and fluid from the pleural cavity which had a distinct carbolic odor, and caused unmistakeable tingling in his mouth. From this time forward the pus was expectorated constantly and freely, and in a day or two was free from smell. The wounds healed up rapidly. All his symptoms subsided, and from this time his recovery was uninterrupted. In a few days he was able to be taken out into the air and sunlight, and in a couple of weeks was convalescent. He was one of the last remaining patients at Saskatoon, and embarked on the hospital barge on the 4th of

July, and was discharged when he reached Winnipeg on the 15th of the same month. He has since enjoyed the best of health, and at the present time writes that he is quite well and strong. I have no doubt but that the thorough exploration of the cavity and the removal of sloughy tissue on the 23rd of May opened communication with a bronchial tube of considerable size, and that henceforth the cavity was kept freely evacuated by expectoration. This, I think, was the starting point on the road to his recovery, which progressed with marvellous rapidity from that time.

CASE II.—*Penetrating Wound of Chest.*

Private H. H. M., 10th R.G., aged 19, was wounded at Batoche on the 12th of May, 1885. When brought into the zareba he was suffering from dyspnœa and painful inspiration. He had also coughed up a little blood soon after receiving the wound. On examination, a bullet wound was found about an inch to the right of the vertebral column, opposite the fifth dorsal vertebra. The track of the bullet could be traced as far as the vertebral column, passing deeply through the muscles of the back, and the bullet itself (a round one) was felt beneath the skin at the angle of the left scapula. It was immediately removed, and the wounds cleansed and dressed with iodoform. There were no marked chest symptoms until after his removal to Saskatoon, where he arrived on the 15th. The wound was then suppurating freely, and he suffered from considerable pain and uneasiness in the side and high fever. A few days later the left chest was found to be gradually filling with fluid; a hypodermic needle was introduced, and half a drachm of odorless sero-pus withdrawn. The chest filled rapidly, and the patient suffered from chills and fever. The pleural cavity soon became filled to the apex, and displaced the heart slightly. The flow of pus from the wounds now became greatly increased, and pus was forced out from both wounds, but especially from the posterior one (the wound of entrance of the bullet), on coughing. I then administered ether, and made a free opening through the 7th intercostal space and in the existing wound, and evacuated

a large quantity of pus having a slightly fœtid odor. Through this opening also came, at this time, pieces of red cloth from his tunic and pieces of his shirt and undershirt. On examination while the patient was under ether, a long probe passed directly into the pleural cavity from the original wound. The bullet was found to have passed between the spines of the 5th and 6th dorsal vertebræ, close to the bodies of the bones, and to have roughened the edges of both spines. The opening of the cavity and the insertion of a large drainage-tube gave great relief, and all the active symptoms subsided promptly, although the discharge continued for a long time. His recovery was slow. The pleural cavity was washed out with antiseptic solutions from time to time, and nourishing food and stimulants were administered, and the patient was soon able to leave his bed and go out into the fresh air and sunlight in daytime. He was brought down to Winnipeg on the hospital barge, still very weak, and placed in the General Hospital there on the 15th of July, under care of Dr. Kerr. He remained there for some time, and reached his home in Toronto, I believe, about the end of September. He is now perfectly well. There was great retraction of the chest wall during convalescence.

In this connection I wish to mention briefly two other cases which did not come under my observation at the time their injuries were received, but which I saw later on :

Pvte. L., 65th Batt., was wounded on the 28th of May at Frenchman's Butte. He was struck on the posterior wall of the right chest, the bullet making its exit in front at a point nearly opposite. He suffered from severe respiratory symptoms and spat up some blood, and a penetrating wound of the chest was diagnosed. He recovered rapidly, however, and when I saw him on the 12th of July, his wounds being then perfectly healed, there were no chest symptoms, no alteration in the conformation of the chest, and no physical signs to indicate that the pleural cavity or its contents had ever been disturbed in any way.

A similar case was that of Sergt. F., N.W.M.P., who was wounded about a week later, in Steele's engagement at Loon Lake. He also had very severe symptoms of pulmonary injury,

dyspnœa, bloody expectoration, hurried breathing, etc., but recovered rapidly and perfectly without any serious pleural or pulmonary inflammation. I saw him on the 18th of July, on his return to Calgary to report for duty. He was then apparently in perfect health.

In gunshot wounds of the chest, the important point in prognosis is, of course, whether the bullet has penetrated the chest walls or not. In the surgical history of the American Rebellion, the mortality in a group of over 8000 cases of penetrating wounds is given at 62.5 per cent., while in a similar group of non-penetrating wounds the mortality is 2 per cent. The four cases which I have reported show the difficulty of making an exact diagnosis, unless the patient can be kept under the observation of the same surgeon throughout his illness; and as our knowledge of such wounds must be mainly derived from military surgery, this is, of course, nearly always impossible.

Case II of this series was not thought to be a penetrating wound when treated on the field. Cases III and IV were so diagnosed, and yet, I think, the subsequent histories show that Case II was undoubtedly a penetrating wound, and that the others were not. One could hardly help making such a diagnosis, however, with the symptoms shown by these men at the time of receiving the wound—cough, distressed and hurried breathing, and bloody expectoration. The fact that the symptoms did not persist beyond a few days, and that there was no evidence of pleural or pulmonary inflammation, or of the results of such inflammation, makes it quite clear, I think, that these were only wounds of the soft parts of the chest wall, external to the pleura, and the blood expectorated at the time of the wound may be explained by the contusion produced by the bullet. I consider Case I an extraordinary recovery, under all the circumstances, and considering the nature of the injury and its termination in gangrene, which destroyed a large portion of the lung. Empyema followed as a matter of course, but, fortunately, the axillary wound was favorably situated for the evacuation of the pus and the removal of the necrosed pulmonary tissue.