logical condition almost of necessity remains, which is liable to produce a chain of symptoms which may terminate in death, since as has already been said, a number of cases are recorded, some of which were hemorrhagic, where the tubercle bacillus was undoubtedly the cause, and yet at the autopsy, several months later, the local process had healed through the obliteration of the sac, the fatal issue having been due either to the further progress of the disease in other organs or to the effects of the pericardial adhesions. These same bacteria are now recognized as the most frequent causes of idiopathic inflammations of the pleura, and from analogy it is probable that they are equally active as factors in idiopathic inflammations of the pericardium, though from the rarity of the latter this is less susceptible of proof. This view is supported by the discovery of their presence by Eichorst in eight cases of pericarditis of spontaneous origin out of twenty-seven, and is unhesitatingly endorsed by him both as to the pericardium and the peritoneum. As a corollary to this the question arises whether, if in tubercular pleurisy, recovery is so frequent as to be practically the rule, it may not also occur when the pericardium is attacked, a question, which in the opinion of the writer deserves an affirmative answer.

The selection of the fourth right space in this case was certainly justified by the result, and while a study of successful cases shows that the fifth space, more frequently the left than the right, was more often chosen than any other, equally successful results were obtained when the needle was inserted in other, occasionally extraordinary, situations. In two cases aspiration was done through the back near the angle of the scapula, while in a case with which the writer was connected, fluid was obtained with the needle introduced below the right costal border nearly in the mammillary line, the accumulation being so great that the diaphragm and liver were greatly displaced downwards.

REPORT OF FIVE CASES OF WOUNDS BY THE MAUSER BULLET, WITH REMARKS.

BY J. H. STEVENS, M.D., BOSTON,
Ex-Surgeon Cuban Army.

THE adoption by the United States Army of the Krag-Jorgensen Rifle, following the adoption in England of the Lee-Netford and in Germany and Spain of the Mauser, has given rise to a great deal of discussion as to the efficiency of these small-calibre rifles. The present war is expected to settle definitely the question as to their possibilities in future campaigns, inasmuch as the United States is concerned. The Mauser is the only one with which I have had any practical experience, and as I have had the opportunity of treating wounds inflicted by this rifle side by side with those made by the older arm, I have ventured to send this report of a few cases taken at large from my notes. They are in no way more remarkable than the average. Perhaps a few remarks or, at least, a general summing-up of my conclusions in regard to this weapon will be apropos.

The Mauser cartridge (Spanish) is a long pencil-shaped cartridge with a bullet jacketed with an alloy of copper, zinc and nickel, and having a calibre of only .295. The initial velocity of the Spanish Mauser is approximately 2,250 feet per second, and their tre-

mendous increase in velocity can be very readily appreciated by comparing it with the 1,300 feet per second velocity of the old Springfield rifle. The advantage in velocity and range combined with a beautifully flat trajectory make the new rifle theoretically, at least, a most destructive and seemingly efficient weapon. The penetrating force of the bullet is also proportionately increased, and I have seen small tree trunks completely perforated by the Mauser.

But the conditions which could suppose several men in the line of a bullet are (to my mind) few in actual battle, and will become even more rare in the battles of the future where massed troops will play a minor part, and where charges in open country will be an impossibility.

Presuming that the object of war is to disable, without necessarily killing or fatally wounding the individual (because a wounded man becomes an incubus upon the army and requires a great amount of attention), then it becomes a question as to whether more men can be disabled by the small-calibre bullet, in view of its much greater range, and its primary effect upon men so wounded as compared to the old-time bullet.

Granting that the new rifle means an increase of wounded men, it would still remain a question as to whether the lessened severity of the wounds would not more than compensate for the increase in numbers. The experience of the Russo-Turkish war (experience which I think has been borne out since) has proven that very few men receive wounds at great distances, and this advantage of range, considering the inaccuracy of the new arm at long distances would be, I think, more theoretical than real.

The experience of the English surgeons has certainly coincided with my own observations, as evidenced by their use of the so-called Dum-dum bullet in the late Mahmoud and Tirah expeditions.

Shock, so potent a factor with the old rifle, is very slight with the new weapon and the stopping force of the bullet (unless cut) is practically *nil*, men even mortally wounded continuing in the fight under the impression that they have received a very slight wound. An advantage to the wounded (if not to the armies engaged) will be the facility with which wounded men will be able to reach the primary dressing-station, as a much greater percentage will be able to walk, especially in cases of wounds to the extremities which form nearly seventy per cent. of all wounds received in battle.

The duty of the medical officers will be greatly simplified instead of increased, and this greater percentage of wounded who will be able to practically take care of themselves, at least for the time, will be a factor which must be taken into account in considering any considerable increase in the working force of the medical corps.

Unless a soldier receives a wound in a portion of the body considered vital and dies at once, his chances of recovery are very good even under the most filthy surgical conditions and where treatment is of the worst. It can be made as a general statement that wounds (ordinarily) by this bullet require very little treatment.

There is little pain, little hemorrhage, the wounds of exit and of entrance are practically the same, there is little inversion or eversion of tissue, they are easily closed, seldom require drainage and the recovery is

extremely rapid once the surgeon has *learned to keep his hands off*.

As to the statements that wounds made under four hundred yards would be of a more serious nature I can only say that the cases which have come under my observation have certainly not borne out this assertion. Wounds made by ricochet bullets are, as can readily be imagined from the shape of the Mauser, of a most horrible character. I can see no advantage in the change from the old to the new style of weapon, and I think that actual service will demonstrate the inefficiency of the arm.

If the end of a bullet be cut to allow of a setting up then you diminish the penetration, and as most wounds are received at comparatively short range, I do not see how any one can claim an advantage for the Mauser. The reader can, however, judge for himself.

CASE I. Lieutenant F. E. Y. G., wounded at Saratoga, in the Province of Camaguay. The ball (Mauser) struck him upon the outer side of the right leg, juncture of the middle and lower third, passing directly through the tibia and leaving only a small round hole at entrance and exit. The ball also passed directly through the body of the horse which he was riding. There was little difference in the wounds of entrance or exit, no inversion or eversion of tissue, slight bleeding and, so far as examinations showed, no splintering of bone. The pain was very slight. The wound was absolutely untreated for five days and subsequently dressed with iodoform gauze. Recovery rapid and complete.

CASE II. A. G., wounded with Mauser. The ball struck him directly over the right knee-joint, perforated, without splintering, the patella, and the wound of exit was one-half inch inside the tendon of the semitendinosus muscle. The wound was dressed with sublimate gauze, and the recovery was good, an almost perfect use of the joint resulting.

CASE III is an even more remarkable case, involving a wound of the right lung. The patient, a private, received his wound June 10, 1898, the bullet (Mauser) entering between the third and fourth ribs and one and one-half to two inches to the right of the sternum, ranging slightly downward owing to his position in the saddle, and having its exit one-half inch from the interior angle of the scapula. This case was not seen until the fourth day. He had covered the wounds of entrance and of exit with pieces of cloth, torn from his jacket. There was slight cough. Bloody sputum was very slight, he said, after the first two days. His temperature was normal and he was walking about. At no time during his convalescence was he confined to the recumbent position, and he made an uninterrupted recovery.

CASE IV. Private of the Camaguay Regiment. Wounded in the side of the neck just above and to the right of the junction of the clavicle and sternum by a Mauser bullet, presumably a ricochet. The wound was of a most horrible character, the muscular tissue of the right side of the neck being almost entirely carried away, and the esophagus and trachea exposed and torn across. The patient bled to death before anything could be done for his relief.

CASE V. Will serve as a contrast case, and is only a fair illustration of the difference in effect between the Mauser and the old lead bullet. E. F., private, was wounded by a Remington copper-covered bullet.

The ball struck him just above the elbow of right arm, smashing and splintering the humerus and tearing the muscular tissue in a most terrible manner. Amputation. Recovery.

The Spanish regular infantry being armed almost, if not entirely, with the Mauser, while the scouting parties, composed for the most part of volunteers, were armed with the Remington and Winchester, gave me an opportunity of making many comparisons between the two kinds of wounds. No man struck by the old lead bullet was ever known to complain of lack of stopping force.

The cases which I have given above are selected at random from among my cases, and are certainly fair samples by which to judge the rest. I hope at some near date in the future to report more fully upon these cases, especially several of remarkable abdominal wounds.

Reports of Societies.

SUFFOLK DISTRICT MEDICAL SOCIETY. SECTION FOR CLINICAL MEDICINE, PATHOLOGY AND HYGIENE.

E. W. TAYLOR, M.D., SECRETARY.

REGULAR meeting, Wednesday, April 20, 1898,
DR. W. F. WHITNEY in the chair.

DR. A. K. STONE read a paper entitled

ALBUMINURIA.¹

DR. OGDEN: I have been very much interested in Dr. Stone's report of the investigation which he has made. I agree with him perfectly in the statement that the presence of albumin is only a part of the picture of the urine, that is, it is important to have the twenty-four-hour quantity if possible, to know the specific gravity, the total amount of urea, the presence or absence of albumin, the presence or absence of sugar and the characteristics of the sediment. Albuminuria in itself is really of very little importance excepting that it is, as Dr. Stone said, a danger-flag. Every albuminous urine, therefore, should have a thorough examination, in order to ascertain, if possible, the true significance of this abnormal constituent. It usually shows the existence of a pathological renal condition, or the presence of pathological non-renal elements.

I consider the nitric-acid test and the heat test for albumin by all means the most valuable. The tests by means of tri-chloroacetic acid, and Millard's reagent, as well as by any other reagents are really too delicate, for they not only precipitate the common forms of albumin, but precipitate also peptons, as well as certain other substances. Some of these reagents, notably Millard's, give reactions for albumin in nearly every urine — normal or pathological.

The subject of albuminuria would be a perfectly simple one if we had to deal only with serum albumin, but the presence of so many other proteids in the urine often makes the subject very confusing. If the urine contains albumose, it is precipitated, together with any serum albumin that may be present, by nitric acid, but is usually not differentiated from the albumin, with certainty, until the heat test is applied, when it is found that a dense white precipitate forms by gentle heat, and re-dissolves on boiling, leaving only the pre-

¹ See page 285 of the Journal.