

## MICROBES A GREAT MENACE TO MODERN FIGHTING MEN

Wonderful Work by Army Surgeons in Their Heroic Warfare Against Disease and Death on Battle Fronts.

By a Medical Correspondent.

The microbes infesting soil and water constitute one of the most powerful menaces to the successful prosecution of war.

Never in the history of the world has a war been waged in which deaths from pestilence and wounds have affected so little the progress of operations; yet the menace remains and the toll of the bacteria continues to play no small part in the wastage of our armies. The extraordinarily small number of enteric cases among our troops in France is a remarkable testimony to the excellence of our sanitary arrangements and the value of the preventive vaccination introduced by Sir Almroth Wright.

In Gallipoli where sanitation was practically impossible, where the soil was infested with the microbes of typhoid and its cousins, the paratyphoids and dysenteries, where the very sand of the seashore was partly built up of the creeping amoebae of tropical dysentery, the percentage of sickness cases among the troops reached a very high figure indeed.

The influence of these microbes of the soil on the healing of wounds forms the subject of a recent paper by Mr. Kenneth Goadby in the "Lancet." Since the time of Lister, the surgeon has been able practically to eliminate the danger of bacterial infection from the wounds of his operations. The wounds of warfare are inflicted under very different circumstances. Trenches are dug into soil swarming with microbes, the soil covers the soldier's uniform, and the bullet drives through the infection and inoculates it into the depths of the wound.

### Species of Microbes.

The various species of bacteria present in such wounds and classified in the paper of Mr. Goadby and numerous other investigators may be roughly divided into two groups—the true soil bacteria, which are commonly found infecting wounds in civil practice, and the ordinary organisms of sepsis or inflammation, which may be passed from man to man without the intervention of soil or water. The first group is probably the less important, although it includes the bacillus of tetanus or "lock-jaw," and the frequently deadly organisms of gas-gangrene. The latter group contains the common microbes of septic infection, the streptococci and staphylococci, dot-like organisms arranged in chains or clusters, which produce such conditions as cellulitis, erysipelas, abscesses, and boils. Of all these organisms, the most deadly may be the streptococci, which can produce death from septicaemia or blood-poisoning in a few hours. But these groups of bacteria are found in the soil; many species of both may be present at the same time in one wound.

To prevent the entry of these microbes into wounds is obviously impossible. To kill them after they have entered is rarely feasible, though their activities may be held in check by the use of antiseptics and by surgical or mechanical treatment.

Modern medicine aims further at neutralising the poison produced by the microbes, or at so increasing the resisting powers or anti-bodies of the patient that the infection is shortened and complications are avoided.

The neutralisation of the poison is particularly directed against the tetanus bacillus, and in cases of obvious, infected wounds a preventive dose of antitetanus serum is given immediately. By this means cases of tetanus have been reduced to a very low figure. In a number of infected wounds, in 11 out of 21 cases examined by Dr. Dudgeon, the tetanus organisms have been identified—an experience, however, which differs from the findings of Mr. Goadby—and the interesting fact emerges that many soldiers may harbor these bacteria in their wounds and yet suffer none of the symptoms of tetanus. This condition may be in part attributed to the action of the antitoxin, which is capable of neutralising the toxin or poison of the bacillus, but which has no effect upon the vitality of the organisms themselves.

### Increasing Patients' Resisting Power.

The method of increasing the resisting powers of the individual by vaccine treatment is referred to by Mr. Goadby, and the points to which he particularly draws attention are the prevention of "sinus" cases. By a sinus is meant the sudden recrudescence of the symptoms after a period of complete or partial quietude. A sinus is a narrow unhealed track leading from the surface into the depths of the wound. The occurrence of sinuses and the persistence of sinuses is due to the continued presence of microbes in the wound area. A wound may become

completely healed over and the patient be left in apparently perfect health, yet a nest of microbes may remain shut up in the depths of the old wound ready to burst into renewed activity at a later date. The enclosure of living microbes in this way is particularly apt to occur if a foreign body, such as a fragment of dead bone or a particle of clothing, remains in the depths of the wound, and the flare appears usually after some subsequent surgical procedure, which may in itself be trivial.

We may cite the instance of a soldier who received a bullet wound in the hip. The wound was infected, but healed in a short time. The patient, however, had received damage to his hip joint, and was left with a shortened and stiff leg. After a year of convalescence an attempt was made to improve the joint condition. An anaesthetic was given, and the leg forcibly moved. Immediately after this manipulation the temperature rose, the patient became generally very ill, and an abscess developed in the depths of the healed wound. In this case the streptococci implanted by the rifle bullet over a year before had remained encapsuled on a fragment of dead bone in the joint, and had been released when the joint was manipulated. Very similar results may follow operative attempts to close sinuses, and Mr. Goadby gives several examples; but he found that if patients were first vaccinated against the particular organisms present in the sinuses these flares are largely prevented.

Another important complication of septic wounds is found by Mr. Goadby to be influenced very favorably by vaccine treatment.

Secondary hemorrhage implies the loss of blood which may occur after the bleeding due to the actual injury is stopped. This secondary hemorrhage is caused by the spread of the damaged area owing to bacterial action into the adjacent blood vessels. If these vessels are sufficiently large death may ensue or may be avoided only by amputation of the limb. In 24 of Mr. Goadby's cases treated by vaccine no instance of secondary hemorrhage occurred; in 23 similar cases untreated by vaccine eight suffered from secondary hemorrhage.

Mr. Goadby's paper may be read in conjunction with those of numerous other medical men which have appeared in the course of the war as showing the great progress which has been made by bacteriologists and surgeons in the treatment of wounds, the lessening of mortality and the saving of limbs, which in the old days would have been ruthlessly sacrificed. This work continues unceasingly at home, abroad, and in the trenches themselves.

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## COPPER HISTORY MAY BE WRITTEN NEXT WEEK

Special to The Standard.

New York, Aug. 25.—Another chapter in copper history is expected to be written early next week with the actual signing of contracts calling for the delivery of large quantities of electrolytic copper next year to England and France. It is understood deliveries will run through the first half of 1917 or up to June 30 and that the price will be between 25 and 28 cents a pound.

### ROBINSON TOO MUCH.

Leslie Mann imagined that he was considerable of a jester until Wilbur Robinson took a fall out of him. "You are getting thin since the Braves started going," said Les to the corpulent Wilbur, and the joyful leader of the Robins came right back with "Those Braves have become quite a ball club since Stallings let you go to the Federal League."

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## The Truth Made Men Stop and Think

A RECENT statement by the President of the Chandler Motor Car Company on "motor car values and motor car prices" occasioned more searching thought on the part of prospective motor car purchasers than any other announcement that has been made by the Automobile Industry this year. It came as a revelation to many who had considered themselves well informed.

That statement led to the purchase of Chandler Type 17 Sixes within the past three weeks by hundreds of men who had been attracted, by extravagant advertising or otherwise, to some one of the several "marked up" cars in the medium priced field.

If you read this statement by the President of the Chandler Company, as you probably did, you know what we mean by "marked up." You know that in recent months sums ranging from \$80 to \$200 have been quietly tacked on to the selling prices of these Chandler competitors.

The explanation of the marked up prices has been the abnormal conditions, said to exist and really existing in a degree, in the motor car material market.

But you know, too, that the Chandler car has not been marked up.

And so you can still buy this great car—greatest of all the Sixes—at the same price established eighteen months ago, long before the war had made any effect on the material markets. And bear this in mind, that every change made in the Chandler car in all these past months has been a refinement and an improvement. Every addition to it has represented increased manufacturing cost. Not a single thing has been cut out of the car.

Bear in mind that today, while others are asking you to add eighty, a hundred, a hundred and fifty or two hundred dollars to your check, \$1845 plus freight buys you this big luxurious highly refined Chandler—this Chandler with the marvelous motor, the exclusive Chandler motor which has been developed and perfected through four years

of intelligent manufacturing and four years on the road in the service of thousands of Chandler drivers.

Bear in mind that the Chandler is still featured by its Bosch Magneto ignition—which others leave off, even the marked up cars, because it costs so much more; still featured by its solid cast aluminum motor base extending from frame to frame—where others use cast iron; still featured by the sturdiest, simplest chassis; still featured by ball bearings in rear wheels, differential, transmission and elsewhere, which helps make it the lightest running car on the road.

Bear in mind that in this Type 17 Chandler you get the exclusive Chandler full floating rear axle with its silent spiral bevel gear differential. And that you get the highest standard of carburetion that the market affords; Gray & Davis separate lighting and starting system; big double external and internal brakes, which stop the car at the instant of command and hold it safe on any grade.

Bear in mind that you get all of these highest grade, high priced features and scores of others which, together with Chandler workmanship, go to make up a car the superior quality of which cannot be questioned in comparison with the quality of any one of the many "marked up" cars.

And remember, too, that in the Type 17 Chandler you are offered the beautiful tonneau cowl bodies which preceded the mid-summer "new models" of other makes by seven months time.

In the Chandler you get mechanical excellence, luxury of body design, trim and finish, at the minimum of purchase price.

If we asked you to pay \$100 more or \$200 more that wouldn't make the car a bit better.

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