

MEDICAL ASPECTS OF THE EUROPEAN WAR

FREDERIC H. ROBINSON

SAYS the French *communiqué*: "In the region of Arras we have made some progress. Along other parts of the line only unimportant engagements have taken place."

"The situation continues favorable," the Berlin report announces. "In the Argonne we have repulsed the enemy's attacks and have captured 200 uninjured prisoners."

Civilian Paris is reassured. Berlin is increasingly confident. London reads and goes about its business.

In the grey dawn of the morning that follows, you may see an apparently interminable line of motor ambulances, with sleepy, white-coated surgeons and attendants, gliding out of the gates of Paris. They are bound for the scene of battle, fifty or sixty miles away, to pick up the human fragments of the "unimportant" engagements of the previous day and carry them back to the great base hospitals near Paris. The cars leave quietly, in the semi-obscurity of early dawn, for young patriotism must not be chilled by the ghastly realities of war.

And daily this terrible procession continues, only the lines of motor cars grow longer; to the regular ambulances are added thousands of other cars; and the faces of many of the surgeons have become aged and haggard.

Much has been written about the "harmlessness" of the modern bullet, about the safety and luxury of modern intrenchments, with their bomb-proofs, cemented floors and improvised shower-baths. Newspaper correspondents have been permitted to inspect hospital cars *de luxe*, with enamelled operating rooms, bath rooms, and every appliance of modern surgery. Photographs have been published of wounded French soldiers convalescing in Louis Quinze beds, and attended by aristocratic nurses from the Faubourg St. Germain. Groups of German officers surrounded by surgeons and nurses are shown recovering in a handsome hospital somewhere in the interior of Germany.

Of the terrible "gas" gangrene camps within a stone's throw of Paris, of the ravages of tetanus (lockjaw), of the

dreadful dysentery trains in East Prussia, or of the cholera camps in Austria and Russia, little has been said. But gradually, from the unemotional reports of the sanitary officer and the surgeon, the medical history of the war is being written. A true picture of conditions in the war areas is emerging from the fog of contradictions and sophistries in the daily official reports.

Graphic writers have featured the huge German guns that boom their messages of death from a distance of ten or twelve miles, or the marvellous French artillery, as the great destructive agents of war. But in war the destruction by bullet and shrapnel and shell is incomparable with the toll of life taken by disease. Disease, not powder and lead, is the great destroyer.

Eighty per cent. of the deaths in the present war are due to disease. To one man killed by bullet or shell four die of infection. This is the estimate of Professor F. M. Sandwith of London, a world-authority on military surgery. Early in the conflict Professor Kracke in Germany warned Europe that fifty per cent. of those who went into the world-war finally would be incapacitated by disease or wounds.

But this does not mean that science has failed. For the first time in the history of great wars, typhoid fever—the Nemesis of all field armies—has been reduced to practically local outbreaks. Sir William Osler is authority for the statement that even in the water-filled trenches along the Yser only isolated cases have occurred. Typhoid fever claimed over 90 per cent. of our men in the Spanish-American War. It was the chief cause of death in the English armies in the Boer War. In spite of the stupendous scale on which the present war is being fought, the shortage of medical supplies in nearly all the armies, and the unexampled demands upon the sanitary and medical services, it is certain by this time that the genius of modern science will prevent the spread of the great devastating diseases that marked the history of former campaigns.

But new problems have arisen. New conditions have had to be met. Military leaders have acknowledged that many of their generally accepted theories have been profoundly transformed by the experience of the present war. It has been no less so with medical science. "This is an eighteenth century

war, conducted with twentieth century technique," writes a prominent surgeon from the French firing line, "and science must meet these conditions."

In the western theatre of war, a peculiarly virulent surgical complication that has received the name of "gas gangrene" has been claiming a frightful toll of life. With the exception of tetanus, more men have died of this disease than from all other causes combined. It is the great bane of the medical corps. The disease is liable to affect any wound, whether serious or trivial. So rapidly is it spreading that it has been made the subject of a special report to the English Secretary of State for War. The most famous bacteriologists in Europe are working on the problem. Until recently, amputation had been practically the only means of saving life. And even this was uncertain, as often the disease broke out in another part of the body, after an infected leg or an arm had been cut off. In hastily built lazarets and hospital camps thousands of sufferers from this disease are herded together. So unbearable is the "gas" that comes from this infection that the most necessary attendance is performed under the greatest difficulty.

Along the line of vast intrenchments that mark the north-eastern boundaries of France and up into Belgium lies the most highly cultivated part of Europe. For hundreds of years Norman and Flemish peasants and their descendants have prepared and tilled the ground. And now this "barnyard soil" has been found to be alive with strange organisms that attack the human tissues with terrible results. Hasty investigations have already been concluded, and recently England has put a scientific novelty into the field—a motor bacteriological laboratory that goes from place to place analyzing the soil and seeking to discover a protective serum from this dreaded disease. Several times the announcement has been made that the germ of this peculiar form of gangrene has been isolated and a serum found, but still the death rate is terribly high. Great difference of opinion exists as to the effectiveness of the various serums that have been tried.

Earlier in the war, on the same ground, tetanus, a rare disease in times of peace, killed thousands upon thousands, until science mastered the problem of its treatment. In the French

hospitals the mortality rate from tetanus was nearly 100 per cent. "It is very frequent and very fatal," the German surgeons reported. England sent her greatest bacteriologists to the scene. In Germany, "War Medicine Evenings" were organized in the various medical centres, and every detail bearing upon the disease was carefully seized upon and studied. It was discovered that the soil in the valley of the Aisne was a particularly fertile field for tetanus bacilli. The usual measures proved absolutely ineffective. In desperation it was decided practically to flood the patient with anti-tetanic serum. This was successful. The death rate from tetanus on the German side was reduced to about 30 per cent. In the French military hospitals it was greater.

Soon anti-tetanic serum was worth its weight in gold. Nowhere had the great extent of tetanus been anticipated. In Germany particularly was the shortage felt. Healthy horses are necessary for the preparation of anti-tetanic serum and the German Government has appropriated the available supply of these animals for army use. In England bacteriologists began experimenting with dogs, but the serum thus extracted proved of little value. For some time German medical men have been using potassium salts in the treatment of this disease, but still the death rate from tetanus is high. The precious serum is used only in cases where the infection has not yet spread enough to preclude probable recovery. Every German soldier now carries a special antiseptic preparation and a needle, with printed instructions for injection.

From the standpoint of medical science, the most remarkable reversal in the present war has been the great drift towards antiseptic methods in the treatment of wounds. Indeed so thoroughly has the surgeon of the modern school been drilled in the application of aseptic measures only, that many have opposed the return to the old methods, purely on the ground that the modern surgeon would do more harm than good if he attempted antiseptic treatment. Both in England and France a storm of controversy has been raging over the subject. Pamphlets have been written and speeches have been made on both sides of the question, and the best known authorities in Europe are involved.

"Aseptic measures have failed," some cry. "It is not enough that wounds be guarded against infection; they must be thoroughly disinfected." In France, Professor Tuffier has taken up the gauntlet for antiseptis, and the followers of Lister are claiming that antiseptic treatment has come into its own again.

Great difference of opinion exists also as to the efficacy of certain disinfectant agents. Iodine, liquefied carbolic acid, and even crude petroleum, each has its backers. Carbolic acid has risen from seven cents a pound earlier in the war to over \$1.00 a pound since surgeons have reverted to antiseptic forms of treatment. So widespread has become the use of iodine in the cleansing of wounds that French and English surgeons popularly refer to this as the "Iodine War."

Whatever the failure of purely aseptic measures, it is due largely to the extraordinary conditions created by the new tactics of modern warfare. From Switzerland to the North Sea great armies lie hidden in miles upon miles of trenches, every inch of open space commanded by marvellously efficient artillery of great range. At many points the opposing lines are less than 100 yards apart. An unsuccessful attack at any part of the line leaves the wounded in the open spaces between the trenches. Exposed to the fire of both friend and foe, they sometimes lie for days in plain sight of their comrades, who are helpless to aid them. When the survivors finally are picked up invariably their wounds are badly infected. But even these are fortunate, compared with the men who, wounded while charging the enemy's trenches, have been left hanging in wire entanglements, when their comrades were driven back to their own trenches.

In most cases the trenches are too narrow for the work of stretcher-bearers, so that if a man is wounded and is unable to walk to the rear he must wait until night before he may be removed. Between Nieuport and Dixmude on the Franco-Belgian line, it is practically certain death for anyone to attempt to enter the trenches in the day time. There the advantage is with the Germans in having many ruined houses behind their position, while the Belgians have a clear space in the rear which is commanded by the German artillery.

Over two million sick and wounded men have been treated

on the western front alone since the war began, often under the greatest difficulties. Emergency hospitals eight miles in the rear have been swept away by artillery fire. The quick shifts made necessary by some sudden change in the military situation many times have left the surgeons with little or no medical supplies. Under such conditions the terrible stories that come from individual sources—of emergency operations performed with pocket knives, often without the use of anæsthetics; of soiled bandages being re-used, and other instances that show an alarming lack of the most necessary surgical appliances—may well be true.

The tenseness and hardship of life in the trenches cannot be exaggerated. Cases of suicide have reached into the thousands. "Trench insanity" has become a common term with the surgeons in the field. Some of these cases are utterly hopeless. Thousands of officers and men suffering from nervous breakdown have been invalided home from the front and it will be impossible to employ them in active service again. In Berlin alone there are under special treatment 3,000 officers who have been made nervous wrecks by life in the trenches.

Surgeons have remarked on the many striking ways in which nervous subjects react to the strain of modern warfare, as shown by the dreams and nightmares which disturb the soldiers' sleep. Some develop a tendency to sleep-walking and are found wandering about the trenches, with faces expressing the utmost terror and anxiety. The horror of isolation—the dread of losing contact with his fellows—is the commonest nightmare of men on the firing line. In their dreams they are wandering through endless trenches, as complicated as an artificial maze, or they are picking their way through lonesome forests. The slightest noise during sleep calls up visions of exploding shells, or the tramp of armed men, and they are thrown into a frenzy of shouting terror, to the indignation of their resting fellows.

In the field hospitals near Laon, France, within the German lines, men are taught to use their eyes and hands and feet. They are suffering from a peculiar form of aphasia, due to the strain of protracted gun-fire. Under the direction of Professor Brockenheimer of Berlin they are taught like little children to recognize the simplest objects—a work that requires unending patience.

"What is this?" a doctor asks, holding up a pencil to a grizzled warrior, apparently in the best of health.

The soldier looks at the object in a dazed and wondering way.

"What is this?" the doctor repeats, a little more insistently.

The soldier makes a tremendous mental effort. Then his face lights up: "A pencil."

"Correct," smiles the doctor.

Numerous cases of men suddenly going deaf and dumb, and even blind, are reported from the ranks of all the armies. Their eyesight or hearing organically is not affected, but they are the victims of a rare form of hysteria that may be cured by long treatment. It seems as if the overwrought mind had determined to shut off the horrors which were forced upon it.

Thousands have sought to escape the intense nervous strain of trench duty by self-inflicted injuries. When the military authorities became aware of this many soldiers were taken from the trenches and shot. In this connection, reports from medical quarters throw an interesting light on the circumstances in which so many men are suffering from wounds in the left hand, especially among Great Britain's Indian troops.

Highly colored press dispatches have described how the Indian troops with fearful yells rush to the attack, throwing away their guns when they reach the enemy's trenches. Armed only with a short knife—their national weapon—they grapple with their adversaries in a fight to the death. For German bayonets they have the utmost contempt, simply brushing them aside with their left hands. This, it was explained, accounts for injuries of the left hand so common among the Indian troops.

A well-known British surgeon offers another explanation.

"It is impossible to estimate," he reports, "the number of men who have shot themselves through the left hand in order to escape trench duty. It is scandalous."

So appalling have been the numbers of wounded, so urgent the necessity of quickly shifting great masses of men as the exigencies of the military situation demanded, that the medical and sanitary forces have often been utterly disorganized for want of transportation facilities. Thousands of men have died who

could have been saved had there been adequate means of transportation. But in the great strategic game that is modern war the strong and the useful are considered first. Everywhere admiration has been expressed for the marvellous mobility of the German troops. Great armies have been shifted from the western to the eastern border and back again, and thus the remarkable network of strategic railways in Germany has more than justified itself. But uncounted thousands have been sacrificed to obtain this military efficiency. To transport a wounded man from the western front in France or Belgium to the German base hospitals near Cologne requires from four to seven days, so great is the crush of traffic bearing endless trains of supplies and ammunition to feed the ever-hungry gods of war, not to mention the constant stream of reinforcements.

On the eastern front the most difficult problem before the medical authorities is dysentery. It is spreading with great rapidity both among the German and Russian armies, as well as among the Austrians. This may have a most serious bearing on the health of Eastern Europe in the future. Even now in many districts in Germany this disease, brought back by soldiers from the Franco-Prussian war, has never been stamped out. Medical reports from Heidelberg describe the dreadful dysentery trains that for days at a time monopolize the railroads with their ghastly loads from East Prussia and Poland. Thousands of sufferers lying upon rough straw sacks are transported in freight trains that barely crawl along the congested roads, for right of way must be given to trains carrying reinforcements and ammunition. Without the slightest sanitary facilities, without stop-over arrangements, with a marked shortage of surgeons and attendants, these become horrible funeral trains.

The difficulties of treating this disease, with the transportation problems that have been described, are almost insurmountable. Across the border, in Russian territory, the transportation arrangements are mediæval. In prehistoric coaches drawn by Russian prisoners, German sick and wounded are jolted along incredibly rough roads for a day or more to some remote railroad station, where they are packed in freight trains for a wear-

some journey of six or seven days through East Prussia, to the base hospitals in the interior of Germany.

Aside from the prevalence of dysentery in East Prussia and Poland, the German armies are freer from contagious diseases than those of any other of the European belligerents. Only 26 cases of cholera have been reported in Germany since the outbreak of the war. Like other parts of the German military machine, the medical organization is a marvel of thoroughness and efficiency. Probably there are more than 20,000 surgeons in the field with the German armies. Each army corps is in charge of a surgeon, assisted by an advisory surgeon and an advisory sanitary expert. Then come the division surgeons, the staff surgeons, the battalion surgeons, the senior surgeons, the assistant surgeons and finally the subordinate field surgeons. In addition each army corps has three sanitary columns that march with the fighting ranks. Every soldier has his first-aid packet; every sanitary officer his instrument set. Each battalion has its sanitary supply wagon in which are all first aid appliances.

German medical men have been quick to profit from the experiences of the present war. Not content with the "Military Medicine Evenings" at home, they hold medical and sanitary conferences right within the sound of their armies' cannon. Recently meetings have been held opposite the main French lines at Chauny, Peronne and Pont Faverge. That this exchange of observations and ideas has been productive of much good is evidenced by the success of the Germans in checking the spread of contagious diseases. Even the death rate from tetanus, which was never as high in the German ranks as in the French and English armies, has been reduced to less than 40 per cent.

It is probably in Galicia and Serbia that the greatest danger of plague exists. The approach of warm weather is awaited with considerable anxiety. In Galicia, cholera, the ancient scourge of armies, has been the stalking danger of the war. While cholera has been confined in Germany to 36 cases since the war began, in Galicia 1,370 cases were reported in one week among the Austrian troops. No doubt the disease is even more widespread among the Russians. The Austrians say that the epidemic has been carried into Galicia by the Cossacks of the

Don. The Russians, on the other hand, claim that it travelled into Russia from Turkey, by way of Roumania and Bulgaria. Fortunately the present epidemic is less virulent than in any previous campaign, and the death rate does not exceed 30 per cent. It is the peculiarity of cholera germs that they appear in a new form with every epidemic. The fear has been expressed that the Germans in their attempts to strengthen the Austrian line in Galicia, with the consequent shifting of troops, will carry the disease into Poland, and that the interchange of troops in the west will bring it into France and Flanders. Dr. John Freeman, a noted English bacteriologist, has returned from a special trip to the Russian battle line, with several bottles filled with cultures. From this it is hoped to manufacture an effective anti-cholera serum for the English troops in Belgium and France. So far the disease has not appeared in the western theatre of war.

More detailed observation of the effects of rifle fire considerably modify the first reports of the comparative "harmlessness" of the modern bullet. It is true that striking directly it makes a small, aseptic wound. Also there have been many remarkable recoveries from bullet wounds. Men who have been shot through both lungs have returned to the firing line within three weeks. Soldiers have been almost literally riddled with bullets, yet have not succumbed to their injuries. Often the surgeons do not try even to locate the bullet.

However, so high is the velocity of the modern rifle projectile that ricocheting bullets have caused more serious wounds, and almost as many men have been injured by them, as by direct hits. Some of these wounds are of the most peculiar character. A projectile struck a man's pocket and glanced off without even scratching the skin, but the bullet hit another man and in the wound were found ten deformed pieces of gold that were forced out of the first soldier's pocket. One man lost the sight of his eye by being struck with another man's tooth. From one man's body was picked out part of another man's jaw, and in numerous cases eye-glasses, pocket-books and other miscellaneous articles have been found in wounds.

In many of the French and German base hospitals every body is autopsied. Surgeons have thus cleared up many "mysteries."

Newspaper dispatches from time to time have described a wonderful shell. It liberated a gas that was fatal to every human being within the immediate area of explosion. The victims appeared to have been struck by a thunderbolt—no trace of wound, no blood to be found on the bodies. When the surgeons made the autopsies they discovered that in each case a fragment of shell had made an almost imperceptible wound and had penetrated to a vital spot, causing mortal internal hemorrhages. It was found that this came from the ordinary three-inch artillery shell, which breaks up into an average of 2,000 pieces, some about half the length of a lead pencil and the thickness of a visiting card.

A tragic sidelight of the "atrocities" stories that have been so widely circulated by all the combatants in the European war is the large number of doctors and nurses that have been made the victims of blind hatred. In Belgium, in East Prussia and in Galicia, doctors and nurses have been killed by civilians while the former were attending the wounded. The inflamed minds of the peasants mistook the work of mercy for "terrible atrocities." In France sanitary officers on both sides have been shot without question because they were thought to be poisoning wells, when they were testing the water. The terrible effectiveness of modern artillery has further depleted the ranks of the surgeons, so that already it is apparent that the loss of life in the medical and sanitary corps will be proportionately heavier than ever before. Indeed so many English surgeons have been killed while caring for the wounded that an order has been issued prohibiting them from the trenches. Recently Dr. Derle, a surgeon in the French army, was decorated with the Cross of the Legion of Honor. He was wounded 97 times. Many times slightly hurt, he dressed his own wounds and refused to abandon his post, until a piece of shrapnel finally forced him to give up.

As this is written the end of the World War is not yet in sight, but when history records the details of the greatest catastrophe of all time, the achievements of the surgeon and the sanitary officer will find as conspicuous a place as those of the strategist and the military leader.

THE HANDS

ANNA SPENCER TWITCHELL

I SING the hands of Labor:
The unskilled hands that smite and break and hew,
That cut and dig and draw and cleave,
That blast and delve and heave and dredge,
The sinewy, roughened, horny hands,
The seamed and maimed and knotted hands,
Begrimed and stained and worn—
All the patient, faithful, burden-bearing hands of the world.

I sing the hands of Labor:
The uncouth, virile, hairy hands of men
With dead dreams in their eyes, and in their hearts
The burnt-out embers of dead altar-fires.
The sodden days lie heavy on their souls
As sodden nights weight down their weary lids.
Could dreams and sacred fires be meant for such as these?

I sing the hands of Labor:
Unlovely hands with fingers blunt and shapeless,
The red and coarsened hands of women,
The women with no time for motherhood
Beyond the bearing of the listless babes
Conceived of pale, anæmic passion in sordid intervals
Between the hopeless days.

I sing the hands of Labor:
The hands of youths and maids who come with lagging feet
In the endless procession of workers,
With heavy, sullen features
And old, wistful eyes that question life.

I sing the hands of Labor:
The pitiful, thin hands of little children,
God's little children, robbed of love and laughter,