

GETTING THE FIRST BLOW IN NAVAL BATTLE

This Is Most Important Aim of Commanders During Modern Sea Fights—No Such Wholesale Killings on Land

The following interview with an officer of high rank in the United States navy is of special interest because of the light it throws upon recent events in warfare on the seas.

By RENE BACHE.

IN a sea fight under modern conditions the most important aim of a commander is to get in the first blow. So tremendous is the power of the big guns of to-day and so enormously destructive are the explosive shells they discharge that an enemy's ship, even though of the most formidable type, may be disabled by a single salvo. At least, his fighting efficiency is likely to be seriously impaired if hit early in the game by a few shells.

There are two chief means whereby this initial advantage may be secured. One of them is by greater range of guns; the other is by getting the correct range first. The combatant who first obtains the correct range may be able to overwhelm the fire of the adversary before the latter can start in to do business effectively.

Always in a sea battle the main idea in view is to gain superiority of fire. The object of all manoeuvres in such an engagement is to develop the maximum of your own fire while the enemy is developing only part of his. At all costs he must be prevented from using his guns effectively. If the range of your own guns is greater and your ships are not inferior in point of speed to those of your opponent, you can stand off of his reach and hammer him to death at leisure.

Once you succeed in beating down and smothering his fire you are yourself no longer in danger. You can run in upon him and smash him to pieces at close quarters, with the certainty that he will not be able to make any effective defence. At short ranges your guns can hardly miss, and a few big shells thrown into his vitals will sink him. But if, on the other hand, he gets in the first blow and is able to beat down your own gun fire, it is your ship that will presently go to the bottom.

These matters being understood, it is easy to realize why the naval engagements of the present war have been so remarkably one-sided. In the fight off Heligoland, which terminated so disastrously for the Germans, the British loss of men was very small and of ships none. The Germans, in the South Pacific, appear to have sunk the Good Hope and Monmouth while themselves escaped unscathed. The British fleet in the south Atlantic, again, is reported to have destroyed the fleet of Admiral von Sproy with a loss to itself of only seven men killed and a few wounded.

Now, it is by no means generally understood how remarkable has been the development of the plotting room since the last few years. At the period of the Spanish war it was considered fairly satisfactory if a turret gun on board a battleship could fire one shot every three minutes. Furthermore, the practice with such weapons was far from accurate. In the light off Sandago with Conover's gun, a single shot of range of about 2,000 yards, fewer than four shells in every 100 discharged from the American ships scored hits; and most of the hits were made with the smaller guns. To-day, at twice that distance, a 12 inch rifle would be expected to make three hits a minute.

The turret guns, with their great draughts, such as the Pennsylvania, are of 14 inch calibre and twelve in number. Such a weapon fires a projectile weighing 1,400 pounds and containing a bursting charge of 31½ pounds of high explosive. It is four and half feet long, and at a range of three miles is able to pierce seven inches of solid steel, striking with an energy equal to that of a ton of metal dropped from a height of eight miles.

No warship ever built, or that may be constructed in the future, could possibly stand up against many such blows, especially when it is considered that projectiles of this kind, carrying a slow but very powerful explosive, are so conveyed as to burst after passing through armor and into the bowels of the vessel. If the machinery or other vital parts were hit, she might be disabled by a single shell.

A sea fight under modern conditions, however, is rarely a duel. One of the first principles of naval strategy is to keep the units of a fleet together, for mutual protection and to afford a maximum of power for attack. Thus a battle on the water must ordinarily be of fleet against fleet.

In these circumstances it is considered excellent tactics to concentrate all the guns of a fleet upon a single ship of the enemy, if practicable, putting her out of business, and then turning attention in like manner to another member of the opposing force. There is no such wholesale murder in battles on land as in a modern sea fight, and, as illustrated by happenings of the kind already in the present war, only a very small fraction of the personnel of the vanquished can hope to survive.

This is the age of scientific warfare, but the business of fighting at sea has been much more highly systematized than that of fighting on land. A very important part of peace is battle practice, in which all the conditions of actual combat are reproduced as accurately as possible.

Such practice is held several times a week, and, as a matter of course, much of it has to do with the guns, which are trained upon imaginary targets. Or, as often happens, a fleet is split into two divisions, which steam along in parallel lines several miles apart, each vessel serving as a target for a ship in the line opposite. From time to time, for practice in actual marksmanship, the guns are fired at real targets set afloat on the water and towed along by launches in order that they may be acquired in shooting at moving objects.

In a sea fight every man on board a battleship has his battle station. Excepting only the surgeons, are combatants, not even excepting the cooks and messmen, whose services may be employed for passing ammunition. The captain's post is in the conning tower, a small steel fort provided with portholes. With him in the conning

lower are the navigating officer, the gunnery officer, the torpedo officer, the chief quartermaster and the wireless operator. Inasmuch as the space inside is only ten feet by eight it is fairly crowded.

The battle station of the executive officer is in the lee of one of the gun turrets, not the side opposite the windward, as it is understood, but the battle lee, away from the enemy. It is possible that the captain may be killed, and if such a thing should happen the executive officer must be ready instantly to take command of the ship.

Each turret officer is in his turret, from which, for the aiming of his guns, he keeps watch on the enemy through a sort of crab's eye projecting above, the same sort of instrument, called a periscope, that is used by submarines. For orders to fire he looks to the gunnery officer, who, as already stated, is in the conning tower.

It is the business of the chief spotter to watch through a telescope the fall of the shells fired by the guns and to send messages to the turrets correcting range and aim. His station is on a platform at the top of the foremast. On a similar platform at the top of the mainmast is the relief spotter, who assumes charge of this work in case the chief spotter happens to be killed. Formerly the so-called military tops had machine guns mounted on them, but nowadays they are used exclusively for purposes of observation. They afford the best possible stations for the range finding instruments.

A range finder is an ingenious optical contrivance which gives the observer who looks into it exactly the view he would have if his eyes were twenty-one feet apart. An enemy's ship therefore appears as if seen from two points of view separated by that distance.

This line, twenty-one feet long, represents the base of an imaginary triangle, the apex of which touches the hostile vessel. The instrument shows the two angles at the base of the triangle, which, together with the known length of the base, give the distance of the enemy's craft, or in other words the range.

There are three or four other range finders in various places, on top of the turrets or elsewhere, each instrument being erected on a tripod. The observations of all of them are communicated by telephone to the plotting room, which is under the water line of the ship. There the whole problem is worked out on a mathematical basis, but with utmost celerity, and thence the proper ranges for the guns are sent to the turrets.

Officers of exceptional cleverness are employed in this kind of work, on which so much depends. The plotting room is provided with all sorts of instruments, including a master dial, with a switch which, when turned to one figure or another, causes corresponding figures to appear on dials in all of the turrets.

It might be said incidentally that the range finders give ranges that are only approximately to be relied upon, because various conditions may affect the shooting. Thus, for example, gunpowder does not give in damp weather the same propelling force to the projectile as in dry weather. It is particularly at long ranges that the finders are useful. At short ranges the gunners are able to get along very well without their help, each turret officer doing his own aiming and correcting his range by observation of the fall of his shells.

The fighting of the ship is directed by the captain from the conning tower, in which are the steering wheel, a compass, voice tubes, engine signals, and telephones communicating with every part of the vessel. It is he who gives the order to open fire on the enemy, who governs the steering of the vessel, and who indicates when torpedoes are to be discharged.

All these things he must do without any other means of observing his surroundings than is afforded by peep holes. To see through these peep holes is difficult; it is hard to get relative bearings and distances, the latter being distorted. Much experience is required to overcome this obstacle, and on that account the commanding officer usually goes into the conning tower for practice when the guns are firing at targets.

The most judicious time to let loose a torpedo is when the enemy's ship is approaching a point which the torpedo may be expected to reach at the same moment he does. Torpedoes cost \$8,000 apiece, but it pays under such circumstances to drop three or four of them and take the chance of a hit. Information of the opportunity is communicated from the plotting room. In case the hostile fleet is steaming along opposite in single file, the usual battle formation, and is not too far away, it may be worth while to throw out a few torpedoes in its direction and gamble on the possibility that one or more of them will land.

To get results in fighting on the sea the prime requisite is to be able to carry and deliver at a great distance a large force of men, with adequate weapons and sufficient supplies of ammunition and provisions, the problem being substantially the same as in military operations on land. This is a self-evident proposition, but it suggests an interesting conclusion as regards a subject recently much discussed, namely, the prospect that submarines may render battleships obsolete.

A submarine can travel only a short distance, and then must go back to its base. It is able to carry only a few men, not many torpedoes, little fuel, and only a small amount of other supplies. How, then, is it to be imagined that such a type of craft can displace the dreadnoughts?

A dreadnought of the newest pattern carries nearly 1,000 men and officers, and costs \$15,000,000 to build and equip. It is a mass of complicated machinery, a first class electrical plant being only one feature of its mechanical arrangements. The personnel includes a battalion of infantry, serviceable for fighting on land if there is occasion, which comprises four companies of fifty-two men each, and an artillery section of twenty-six men, with one 3 inch field gun. The whole responsibility for the management and operation of this for-

midaibly garrisoned floating fortress rests upon the commander, whose job, as may well be supposed, is far from easy.

The business of the ship is divided into departments. Its personnel is supervised by the executive officer. The

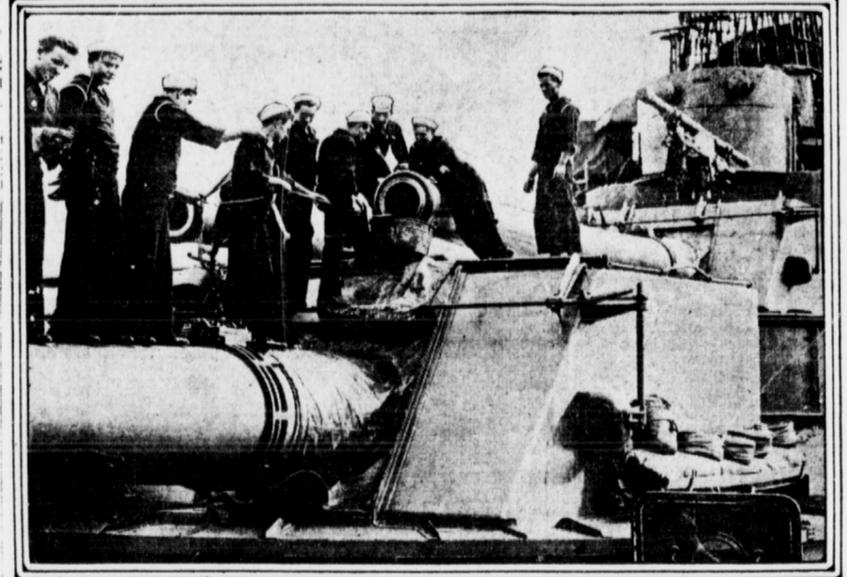
of him, must cater for himself, eating in lonely state in his cabin save when he chooses to invite officers to dine with him. He has his own steward, his personal cook and cabin boy, the latter an enlisted man, and a private range for the preparation of his meals. All the clubs, or messes, are under the direction of the executive officer.

"One might imagine the position of a naval commander to be a very enjoyable one. It is hardly such, for many reasons. To begin with, it is exceedingly difficult for the captain of a ship to maintain agreeable relations socially with his officers and to keep up strict discipline at the same time.

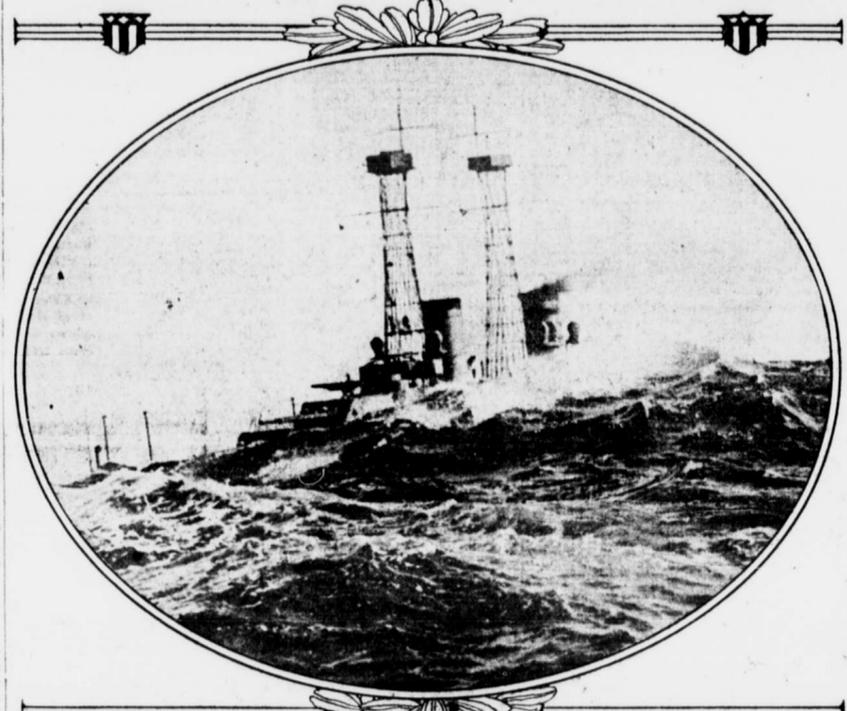
PROBLEMS FOR MEDICAL MEN IN PRESENT WAR

Military Surgeons Face Difficulties of Treating Injuries, the Like of Which They Have Never Seen Before

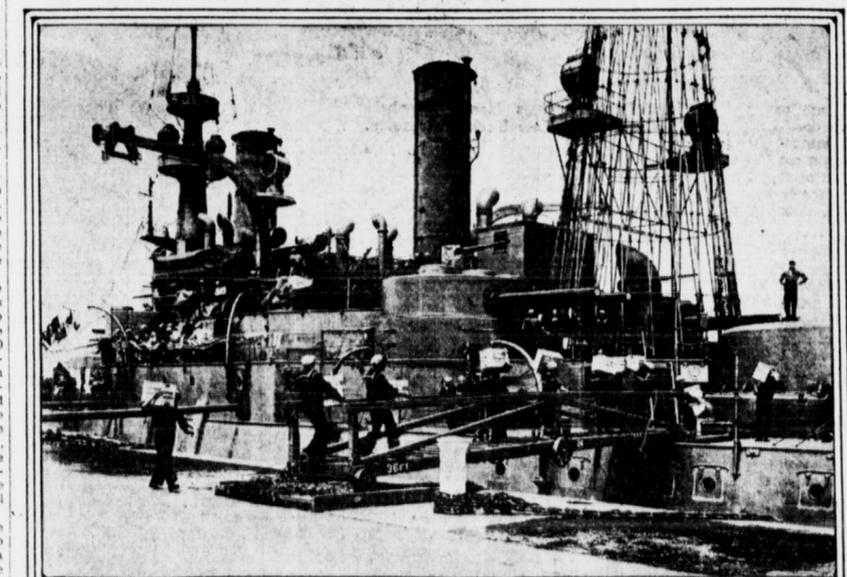
WHAT do I think will be the crucial problem for the military surgeon in the present conflict?" asked a distinguished member of the Medical Corps of the United States army in answer to a question upon this point. "You



CLEANING THE BIG GUNS



AN AMERICAN BATTLESHIP IN A HEAVY SEAWAY



PROVISIONING A BATTLESHIP

engineer officer has charge of all the machinery; the gunnery officer looks after the ordnance; the first lieutenant is accountable for all matters having to do with the structure of the vessel; and so on. But all these heads of departments make their reports to the captain and look to him for authority. Two or three times a week he presides at a sort of police court, in naval parlance, 'holds mast,' this term being applied because in earlier days offenders were judged and discipline meted out at the foot of the mainmast.

The captain's most laborious work, however, is the examination and signing of innumerable papers. Such clerical labor takes entirely too much of his time. He ought to have time in which to exercise an active personal supervision over whatever goes on aboard his ship, but he is continually hampered by the necessity of responding to the demands of an elaborate system of red tape. "All the officers and men are divided up into little clubs, each of which has its cook and manages its own affairs. The captain, because there is only one

If he were seen to indulge in laughing familiarly with one of the lieutenants that single act would loosen discipline all over the vessel. From that time on the ensigns would be more at ease with the executive officer, the petty officer would be a trifle more familiar in addressing the younger lieutenants and the black jacks would pay a slightly less respectful attention to the orders of the petty officers. Everything on board a man-of-war must outwardly observe an air of the coldest formality, else before you know it there will be trouble which can only be settled by putting a score of the men in irons and dropping all social courtesies between the captain's cabin and the wardroom.

Afloat, the captain of a dreadnought is an absolute monarch. He wields despotic authority over a small army of men, and is technically supposed to have power of life and death over every one on board. The case will be remembered of Capt. Alexander Mackenzie of the brig Scorpion, who hanged Mitchellman Spencer, a son of the then Secretary of War, on a charge of mutiny."

camp in time of peace, and indeed the authorities are not by any means in accord as to the probable nature of the wounds likely to be inflicted by the modern bullet.

"As you no doubt know, the conical headed leaden bullet has given way to the steel or nickel jacketed bullet filled with lead and finished with a long tapering point. This is the so-called 'humane' projectile of modern warfare, and it is undoubtedly true that this bullet makes under some circumstances a smaller wound and a cleaner one—the projectile piercing a man through and through without producing the explosive or shattering effect of the blunter nosed leaden affair of other days.

"Within some limits this is naturally to be expected, because the thinner, sharper missile, travelling at a much higher velocity, makes its way through the body substance with less difficulty and, accordingly, with a reduced area of injury when sweeping on upon a straight line. It seems, however, that this humane projectile can act in a thoroughly barbaric fashion.

"Col. La Garde of the Medical Corps of the United States army has made a special study of this subject and his conclusions point to the probability of graver and more desperate wounds from this very bullet, basing his findings upon what he believes to be a tendency on the part of the tapered missile to 'tumble' in flight. By tumbling the military man means the spinning of the bullet about its short axis instead of rotating upon its long axis and holding its point steadily foremost.

"You can see what this means in the case of the present longer projectile. The moment it begins to tumble it presents a larger mass when striking an obstacle in its path and instead of piercing this body like a needle it enters and tears its way through something after the fashion of a whirling wheel." In his contention Col. La Garde is not without a goodly measure of supporting facts.

According to the statistics of two of our medical observers during the Russo-Japanese war, there were 14 per cent. more Russians killed than troops of the Mikado, but on the other hand the Japanese wounded amounted to 12 per cent. more than those in the Czar's forces. At first blush this seemed to be due to the difference in the character of small arms used by the contending nations. Col. John Van R. Hoff, U. S. A., put this question in his official report: "Is it possible that the 7.60 mm. cupro nickel jacketed bullet of the Russians, which weighs 13.7 grams and has an initial velocity of 640 meters, is more humane than the 5.5 mm. German silver jacketed bullet of the Japanese, weighing 10.5 grams, with an initial velocity of 725 meters? This can be answered in the affirmative if to kill is considered more humane than to wound." But Assistant Surgeon-General Hoff gives more suggestive information in the following quotation from a report by the chief surgeon of the Russian forces at Liaoyang:

"The experience here convinced me that the Japanese rifles are better than our own. The range of this weapon is very great. Within 200 meters, although the track of the bullet is small, the wounds were very fatal owing to the explosive effects, there being extensive shattering of bone or in the abdomen tearing of intestines. At longer ranges, 400 to 800 meters, the wounds were less serious. Except in abdominal lesions the wounds inflicted by the Japanese rifle healed quickly. Even in abdominal cases with severe lacerations of the intestines several patients recovered.

"Wounds of the lungs were usually of a less serious nature, particularly if received at the higher ranges. Beyond 1,000 meters the bullet disintegrated and the wounds of entrance and exit were considerably larger than the channel made by the missile in its course through the tissues and bones were seldom shattered."

This would seem to bear out Col. La Garde's idea about the tumbling of the projectile, especially with the decrease of velocity due to longer flight. But the modern bullet is more destructive in that it is capable of killing and wounding more men, bullet for bullet, and this is due to the extremely high velocity with which the missile of the modern infantryman's rifle goes upon its destructive errand.

The Balkan war gave the military world a lot of food for thought and Prof. Octave Laurent has published the fruits of his experiences among the Balkan armies during the better part of a year. At a range of 2,000 feet the modern bullet will pierce three men standing one behind the other; and at a distance of substantially 5,000 feet, just a little short of a mile, the small arm projectile will go right through one man. A little further off the missile will pass completely through the head, making clean wounds at the points of entrance and exit, such is its pent up energy at that range, and at a distance of 11,483 feet, more than two miles, the modern bullet will cause a grave if not fatal wound in the abdominal region.

While Col. La Garde holds the present day bullet to be more dangerous than its bigger and blunter predecessor because of its tendency to tumble, Prof. Laurent attributes its greater destructiveness to other causes. He finds the so-called "humane" bullet of to-day inclined to produce more ghastly wounds because of its explosive effects. When passing through flesh or soft tissues it is not especially noticeable, inasmuch as the missile remains substantially intact, but when the projectile is abruptly arrested in its passage, then the comparatively plastic lead bursts its container, the steel jacket, and shatters the bones and tears the flesh in a most distressing way. The bullet, under these circumstances, is not a single body, but a scattering mass of destructive fragments.

Of course the nature of the wound differs with distance or the velocity of the projectile, but when hitting fluids or relatively fluid masses then the injuries are apt to be of the greatest sort. This applies particularly to wounds of the brain and to injuries to the stomach and the abdominal regions, especially when the latter are filled with food in various stages of digestion.

One can burst a barrel filled with water with its head off by pouring

water into it from a sufficient height through a pipe. It is this same action that is induced by the bullet striking the fluid or the semi-fluid substance, the measure of the impact or the speed of the projectile determining the seriousness of the injury. Prof. Laurent says that he has seen the head of a soldier actually burst open and the brain scattered by a single modern rifle bullet.

But while this steel covered projectile can do an enormous amount of harm the fact remains that it can also put a man out of action effectively and yet make his wound such that it will heal quickly. For instance, this bullet will bore its way cleanly through bone when going at its higher velocities just like a drill, and these injuries if promptly attended to by the soldier himself or a companion will give but little subsequent trouble from a medical standpoint.

Every fighting man to-day in a civilized army is supplied with a first aid packet. If he will but apply this promptly in accordance with the instructions he will prevent infection of the hurt and the wound will heal of first intention. As a matter of fact the Russians do to the extent of 52 per cent. of their wounded, because the Japanese bullet was more humane, was returned to the fighting line inside of one month. Of course it is perfectly clear that the use of the first aid packet figured largely in the speed of recovery by preventing infection of the wounds. This incidentally lessened the crowds in the hospitals, and to that extent reduced the chances of wasteful fevers and allied diseases.

The staggering losses already reported from Europe bear out the fact that there is a awful lack of humaneness in modern warfare, and unquestionably the greater measure of bodily damage has been inflicted by the artillery and not the rifle of the foot soldier.

The type of projectile used in the field gun for the attack of infantry is primarily what is known as a shrapnel, a thin bodied shell loaded with lead balls and a sufficient charge of explosive to scatter them broadcast when the projectile explodes. These bullets inflict extremely severe wounds and cause the greatest measure of destruction of both the hard and the soft tissues of the body. Their power to damage is somewhat akin to that of the old blunt nosed rifle bullet and in this respect there is certainly no gain in the direction of humaneness.

During the Russo-Japanese war there was an extraordinarily large proportion of wounded by artillery fire. As one observer expressed it speaking of the effects of the Japanese fire, "The havoc wrought by their artillery can only be recalled with a shiver. The wounds caused were terrible and usually fatal."

According to Prof. Laurent, it seems that more than half of the fatal injuries suffered during the Balkan campaign were the consequence of artillery fire. The field guns of the French, Germans and Belgians have figured conspicuously in all of the battles so far reported and we are just beginning to hear of the work done by the British artillery. Never before in the annals of civilized warfare have weapons of this sort been employed in such great numbers, nor have they been brought to bear against similar large masses of troops.

No wonder they have slaughtered the belligerents by the thousands, and those not killed constitute the problem for the military surgeon. The soldier's first aid packet is not so likely to answer here as a protective measure against infection as in the case of the wound from small arm bullets, mainly because the injury or injury is apt to be of a graver and possibly of a larger nature.

Now we come to the second phase of the question for the military surgeon—that of properly assorting the wounded and distributing them where they can best receive proper attention and least hamper the mobility of the fighting force. Heretofore there has been a woful measure of confusion, and the field hospitals have been overcrowded with the injured of all degrees, and this has not only hampered the overworked doctors but it has occasioned neglect where promptness alone meant the saving of life. Therefore it may be of especial interest to us now to understand how one of the belligerents is meeting this very problem, and we purpose to take that of Germany because her army has been on the aggressive from the very start and her task, for that reason, has been a particularly heavy one.

The regulations for the German army divide the medical staff into two prime departments; one having to do with the receiving and assorting of the wounded while the second limits its function to active ministrations of the field and the base hospitals. The wisdom of this labor saving system will be apparent in a moment. As soon as the injured man is brought back from the firing line he is at once examined by a medical officer and, according to the nature of his wound, he is classified and duly tagged.

If the man can walk, his hospital badge is a plain white ticket, and this is given to all those, too, that are sufficiently protected already by the first aid bandage and who need but trifling attention to start them on the way to recovery. These men are promptly treated by the physicians of the receiving staff.

The next class are those that are so wounded that it is necessary to transport them and yet whose injuries are of such a nature that they can be carried all the way back either to the army base hospital or on further to kindred institutions. These men are given white labels bearing a single lengthwise red stripe. Except for first aid bandaging or the like, they receive no surgical attention until they have arrived at their designed destination way to the rear.

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The men so badly hurt that they can be removed only a short way from the firing lines, such, for instance, as those suffering from abdominal injuries, are marked with a white ticket having two lengthwise lines of red. These sufferers are sent to the nearest marketing department of the army medical service, and there receive prompt and proper attention by a staff large enough to cope with the situation.