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Trench construction in World War I

By Diana Overbey

When people think of World War I, one of the first images that comes to mind is the trench. Here's a look into how these major features were constructed, as well as their impact on the war.

1. When were the trenches in World War I first built?



French troops waiting assault behind a ditch during the Battle of the Marne.

After the Battle of the Marne in September 1914 (one month after the war truly began), the Germans were pushed back to the River Aisne. The German commander, General Erich von Falkenhayn, assessed the situation. Not wanting to lose the territory in France and Belgium Germany had gained, he ordered his army to dig trenches to defend against French and British troops. The trenches provided necessary protection from artillery shells and machine guns, and gave soldiers a major advantage when warding off a frontal assault. Realizing that they could not break through these trenches, the British and French soon began digging their own.

Over the next few months the equally-matched armies tried to outflank each other, continuously adding on to their trenches as they went. This “race to the sea” ended with two parallel trench lines running from the North Sea all the way to the border of Switzerland. If all of the trenches constructed during World War I were laid end to end, they would cover 25,000 miles.



Because the Germans dug in first, they were able to seize the high ground. This not only gave them a tactical advantage, it also kept them much drier than the British and French, who were forced to dig in areas that were typically only 2 to 3 feet above sea level. This led to frequent flooding and an almost constant presence of water in Allied trenches.



Trenches could sometimes flood as high as a man's waist.

2. How were the trenches constructed?

There were two main ways to dig a trench. There was entrenchment, which was the faster method, allowing many soldiers equipped with shovels and picks to dig a large portion of trench at once. However, this left the diggers exposed to all of the dangers that the trenches were supposed to protect against. So entrenchment had to take place either in a rear area where diggers were not as vulnerable, or at night. British guidelines for trench construction inform us that it took 450 men approximately 6 hours to dig 275 yards of a front-line trench (approx. 7 feet deep, 6 feet wide) a night.

The other option was sapping, where a trench was extended by digging at the end face. It was a much safer route, but took more time, as only one or two men could fit in the area to dig.

These trenches were dug through the beautiful countryside of France, and often through private property, particularly that of farmers. Private Victor Wheeler, a Canadian soldier, described his experience when digging one of the first Allied trenches:

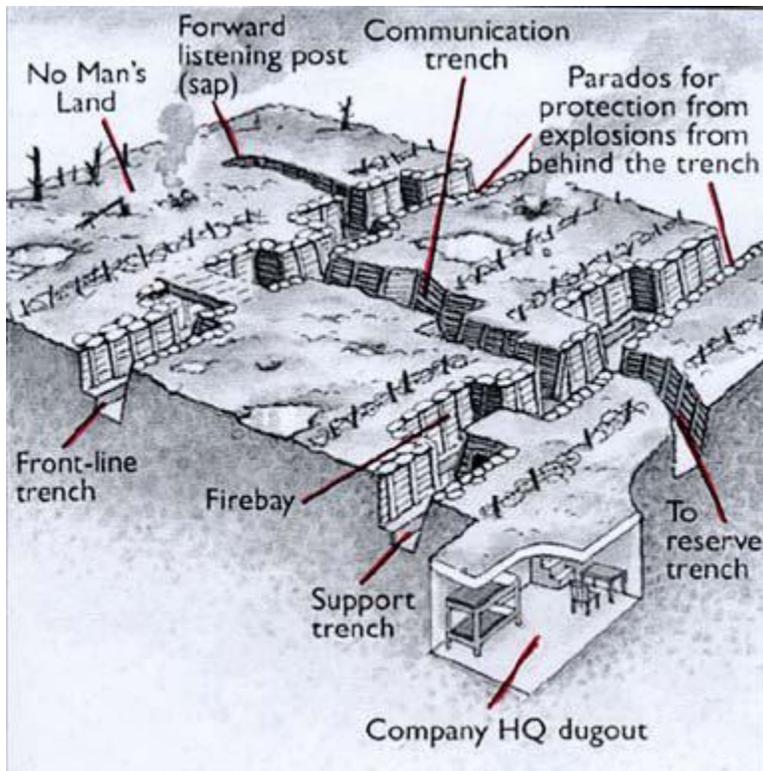
With pick and shovel we dug trenches through beautiful fields of grain, fully realising what damage we were doing to the farmers' hopes of reaping small harvests that would enable them to stem hunger during the coming winter. The patriarch with his ox-drawn plough, the matronly gleaner, and the young woman gathering grass and leaves, roots and truffles, stood arms akimbo, wordlessly, helplessly, hopelessly watching. The depressing effect on the morale of the men – to many of whom raising grain on the Western prairie also meant their livelihood – could not be easily dismissed.

After a trench was constructed, sandbags, wire mesh, and wooden frames would be brought in to reinforce the walls. Wooden planking, referred to as duckboards, were also put in place to prevent men from standing in water, which often led to an ailment known as "trench foot." Shell fire and the weather made constant maintenance a necessity.



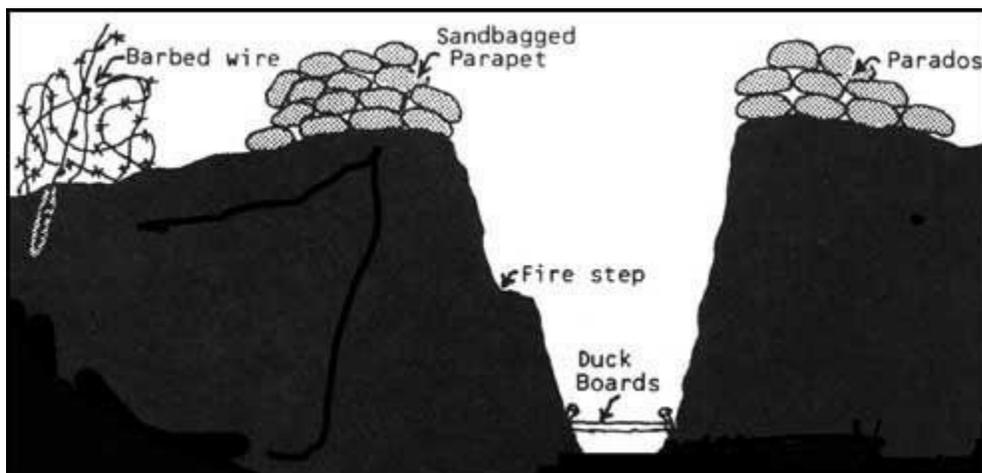
Entrenching

3. How were the trenches laid out?



Trenches were never built in straight lines but instead in a zigzag pattern. This method was used so that if the enemy invaded a trench, they would be prevented from firing down its entire length, as well as providing some buffer in the event a shell were to explode.

Multiple trenches were created on either side of No Man's Land. The front-line trench was exactly as it sounded—it was the first line of defense. Sandbags placed at the opening of the trenches were particularly important here, as they also absorbed bullets that might otherwise hit soldiers. Fire-steps were built into the sides and allowed soldiers to see over with their rifles at the ready when on sentry duty or when an enemy attack was anticipated.



Cross-section of front-line trench

Front-line trenches also had appendages called “saps,” which were dug out into No Man’s Land and used as [listening posts](#) to find out information about the enemy.

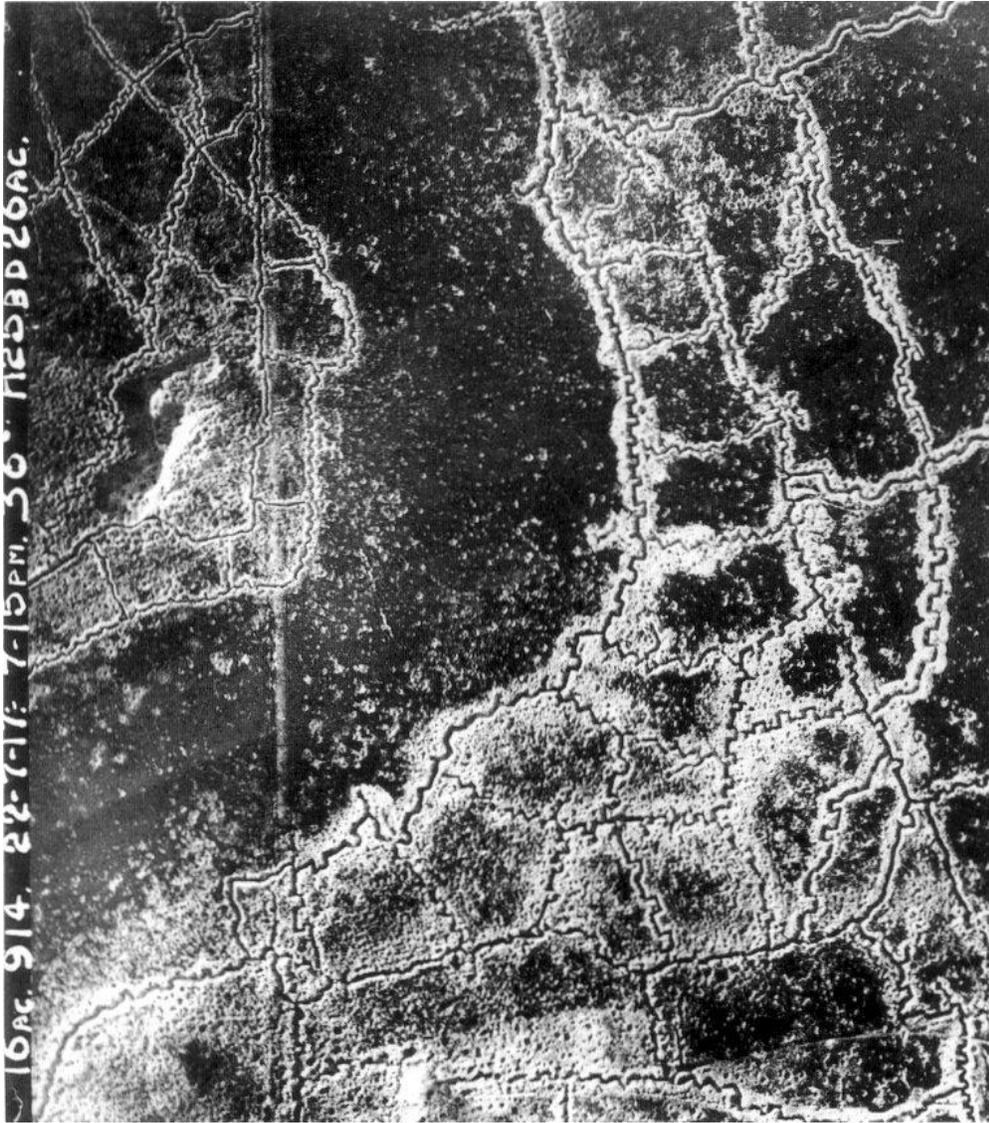
Behind the front-line trench was the support trench. As its name implies, it held support troops and supplies to aid the front-line trench soldiers when necessary. It also could be used as a fall back point if the enemy occupied the front-line trench. Dugouts were typically built in the rear of the support trench, varying in size between 8 to 16 feet for the British.

Beyond the support trench was the reserve trench, which held emergency supplies and troops, in the event the first two failed.

All three of these trenches were connected by [communication trenches](#), which allowed men and supplies to travel safely back and forth. This is also where telephone lines could be run.

A soldier did not spend the allof his time in any given trench. A typical British soldier spent 15% of his year on the front line, 10% on the support line, 30% on the reserve line, and the rest of his time would be spent either on rest, on leave, in the hospital, etc.

4. German trenches



Loos-Hulluch trench system

Unlike the British and French trenches, German trenches were much more elaborate in construction. This was due to the defensive strategy of their army. The above photograph is an excellent illustration of this: the German trenches are located to the right, the British to the left.

German bunkers were also more sophisticated. Unlike the shallower dugouts of the British, German dugouts were typically 12 feet or more in depth, and were sometimes constructed three stories down, complete with concrete stairs. German dugouts also typically had electricity, as well as toilets (luxuries that were not found in Allied trenches).

5. Significance

It soon became obvious to both sides that this would be a war of attrition. Who could outlast the other with men and supplies? Trench warfare created a stalemate that prolonged the conflict

well past what either side originally imagined. It would take the implementation of new tactics and technology to finally propel the war to its conclusion.

Sources: [Spartacus Educational](#), [Trench Warfare](#), [St. Boniface's College](#), [history.com](#)