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## Delayed Action Mines as Affecting the Railways on the British Western Front.

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Our first introduction to delayed action mines was at Peronne in the spring of 1917, but it was not till the summer of 1918 that the really "classy" article was met with. No delayed action mines were encountered previous to 1917, for the reason that there was no call for them. However, at this time, the Boche had retired at several points to his Hindenburg line, and carefully planned and set his mines before retiring. What were called "booby traps," were left behind in billets and "dug outs." Souvenirs of various kinds were placed in positions, with connections concealed, and so that when lifted, a trigger would be pulled, or a trap sprung, exploding charges of various kinds and sizes, intended to cause casualties among our men. After our first losses from this cause, warnings were sent out to everybody and consequently from that time on everyone was on the look out. Sometimes the opening of a door in a billet or dug out produced a terrific explosion, in a similar way, by pulling a cord, which released a spring or other trap, causing the exploding of the charge carefully set for the occasion. Usually when retreating the most attractive billets or dug outs were mined and often those just vacated by the German staff proved the least desirable for habitation by our own troops. They were generally looked upon with suspicion, and not reoccupied without most careful investigations by experts to take care of any "booby traps" that might be found.

The worst booby trap that was brought to the writer's notice could have been conceived by none other than the mind of the miserable Boche, with whom the British played the game as far as methods of warfare were concerned. The body of a dead German was left on a stretcher, beside the doorway, on a narrow street quite near the west end of the railway bridge we were building across the Somme Canal at Peronne during September, 1918. When a party of Australian soldiers attempted to remove the body for burial, the explosion of the charge to which it was attached caused several casualties. The writer did not see the explosion take place, but was satisfied with the authenticity of reports concerning the affair, it being his business to pass the spot for several days in succession and coming in contact with those working on the spot. He did see the corpse on the stretcher and several times over expressed the hope that it would be soon removed. There were many diabolic inventions, but what seemed so to us at first were quite commonplace towards the end of the war.

In his retirement in the spring of 1917 the Boche was not content with blowing up the bridges on the railways in the ordinary way, but trickery had to be resorted to in this also. At first when a bridge was partly "blown" we used what was left of the bridge, when possible, in the construction of the new. It was soon found that this was risky, and parties of tunnellers or miners experienced in

the laying of charges were sent ahead to examine all structures and to remove mines when encountered. Even then we had "blow ups" after we had finished our work. At this time, however, the Boche did not appear to have any refined device for exploding the mines or charges such as he developed afterwards, but it was the shock or weight of the passing train or other such cause that set off the charge.

When possible he carried off much track material as he retired, rails, ties and everything in some cases, especially just out of Peronne, but where this was not possible every rail would be blown, by using charges at every second rail joint, and frogs and switches were his speciality. He never passed them over.

The really "classy mines" as mentioned at the outset were not developed until the summer and autumn of 1918, but when they came it was with a vengeance. The speed with which the enemy retreated from Villers Brettonneaux, which is a few miles east of Amiens, will be judged by the fact that we did not meet with a single delayed mine till Roisel was reached. This mine however did not "go up" till we had actually completed our line into Caudry, and the line had been under operation for some time into Cambrai. Caudry is about 12 miles east from Cambrai, on the line to Le Cateau, and the mine in question had apparently been "set" or timed for about 30 to 35 days. It was located at the main road crossing in Roisel and had escaped detection. A very large crater resulted, and there were many casualties. Indeed so great was the damage done that the trains were held up for over two days.

In this mine, as in all others which were afterwards encountered, a very ingenious device in the way of a time fuse was used. This consisted of a percussion cap of large calibre, encased in a brass holder which also contained a plunger firing pin, operated by a stiff brass spring. The plunger was tied back against the spring in the position for striking, by a small wire encased in a tube with a stopper. A specially prepared acid was admitted to the tube, and when the acid had eaten the wire tying back the plunger, of course the spring was released, the plunger struck, and off went the charge. We found several packages of these ingenious time fuses and each contained a selection of vials of acid of varying strengths, and specially marked, so that the right one could be used to produce the explosion after the proper lapse of days and to suit the situation. These fuses were afterwards specially made, so that they would screw into the nose of a shell, and also so as to resemble the regular nose fuse of the shell. When the Boche found it necessary to abandon a portion, or all, of one of his ammunition dumps, it was quite a simple operation to remove a regular shell fuse from one of the shells and to insert one of the ingeniously timed delay

action fuses and all who would happen to be about the dump when the fuse was "ripe" would, or would not, live to tell the tale, as the case might be.

Later on, old ammunition, shells, and bombs were used in "mining" instead of the regular lines of explosive. It was a very easy way of getting rid of shells he could not take along with him in his retreat. A shell or two, of course of large calibre, buried into a culvert would destroy it, and in the railway embankments it was quite easy to dig the necessary number of wells or pits and to roll into them the proper number of shells or bombs of the proper size, one of which, in each case, fitted with the delayed action fuse, properly timed, would gain his ends in delaying our advance, as the advance could not be kept up without the railways. During the last month of the war all the mines we encountered were of this type. The bombs used were called "pigs," being much the shape of a long pig, about 3 or 4 ft. long and 18 or 20 in. in diameter. We have seen as many as eight of these taken from one charge. A charge of this size would blow a hole in an embankment, that would require from 1,200 to 1,500 yards of material to refill, and there were in the high embankments just east of Le Cateau about 20 of such mines in a distance of three miles, no road crossings being overlooked of course. The blowing of the road crossing meant the tying up of both the roadway and the railway—one stone killed two birds for the Hun.

Probably the two most outstanding cases of delayed mining we had to contend with were at Wombaix and Caudry. The former was in a deep cutting, and we had not detected it. Trains had been passing over the spot every day for about two weeks and the mine had been placed about two weeks before we built the line. It went up while one of our construction trains of track material was passing over the spot and some cars of rails which happened to be over the charge when it went up, went up also, cars and rails being pretty much scattered about the place. The front and rear ends of the train were untouched.

Caudry's main street passed under the track by a subway of steel and brick superstructure and brick abutments. It had been examined for mines and pronounced safe. It seemed quite untouched and our suspicions were aroused, so that it was examined carefully a second time. No traces of mining or disturbances of any kind being found, it was decided to operate our trains across the street, concluding that for once the Boche had overlooked something. Two weeks later, one morning at 9 o'clock it "went up." The superstructure was carried up the track a short distance and deposited down our side of the embankment. There was not sufficient left of the two abutments to tell that there had ever been any. Several civilians were killed. What had happened in this case