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# DUGOUTS AND MACHINE GUN EMPLACEMENTS OF STRONG CONSTRUCTION

By Major Powell, C.E.

When a line of defence becomes of a more or less permanent nature it becomes advisable, if not a necessity, to provide dugouts, shelters, machine gun emplacements, etc., of a strong construction, to increase the safety of the garrison and minimise casualties, and if this fact is not given every attention, it is surprising how one, two, or three casualties, per battalion in the line, per day, will amount up when totalled.

If safe deep dugouts cannot be provided because of the difficulty of unwatering in any particular low lying country, it becomes necessary to give the greatest attention to the form of construction of such an abode built on the surface of the ground.

Such a large amount of accommodation is necessary, immediately, to provide merely protection from rain and small splinters that the original construction is nearly always of a most primitive nature. Then as time goes on, the occupants, not necessarily assisted by Engineers, perhaps not unwisely, try to do all in their power to better the strength of these shelters, as a general rule, by giving all their attention to increasing the thickness of the roofs and providing courses of stone, broken brick, steel rails, I beams, etc., which courses are most often laid simply course after course on top of the existing construction without any additional provision for the increased load on the original sub-structure. As a result, I have often seen a fairly small shell striking such a roof not penetrate but be the cause of the total collapse of the shelter by the force of the explosion.

The theory of building a strong dugout is to build the exposed walls and the roof, as it were, of two shells, the outer one to provide a sufficiently stiff resistance on the nose of the shell to ensure its exploding immediately on impact before any penetration. Then between the two shells to have, first of all, if possible, an air space or cushion of soft material as a shock absorber, and below that again a mattress in the form of an arch not directly in contact or supported by the inside shell for the purpose of distributing the force of the explosion, so that its effect may not be felt on the inside core locally but distributed as evenly as possible over the whole, and if the inside form can be of an arch construction the whole will probably be as strong a design as possible, for a limited space, with particular reference to headroom. If you stop to consider, you will see that for the roof you probably require about 6' from inside to outside.

The question of a machine gun emplacement of a similarly strong character is interesting for the following reason. If it is intended to shoot through a loop-hole, it will be the elevation of the loop-hole that will determine the elevation of the emplacement.

The centre of the loop-hole in most cases would be about one foot above ground-level in order to clear away irregularities of the ground in the immediate front. The seat for the tripod of the gun should be not less than 18 inches below the line of fire and the line of fire should be not closer than 18 inches

THE 'RAGS' OF QUEBEC


We called him Rags
He chewed kit bags
And ate our scraps of meat
When on parade a fuss he made
But lifted high his feet.