

whether the bullet penetrated far into the brain or not. Then the exact spot on the "temporal region" is not given. It is well known that the bullet might injure some parts of this region and not destroy any known cortical centre.

Corporal Farnum was "wounded by a round ball entering the cranium and brain matter." He made a good recovery. No mention is made of the exact seat of the injury, and therefore for localizing purposes the case is devoid of value.

"Private Dillon was wounded by a bullet which entered the cranium near the superior angle of the occipital bone, and passed anteriorly into the substance of the brain." He got quite well. "The ball was never extracted." The ball in this case entered where there is no cortical centre, the visual being further back. The ball passed anteriorly, but, as there is no possible means of knowing how far, the case has no value for localizing arguments.

Private Bemis' case is a very interesting one. He was "wounded by a ball entering a little outside the left frontal protuberance, and passing backwards and outwards. It removed a piece of the squamous portion of the temporal bone, with brain substance and membranes." In this case the course of the bullet was from a point "outside the frontal protuberance" to "the squamous portion of the temporal." This bullet clearly passed downwards, backwards, and outwards in such a manner as to be on a lower level than the speech and face motor cortical centres. If the bullet carried off the very lowest part of the squamous portion of the temporal bone, the centres of taste and smell might have suffered, but no note is made of the condition of these. This case also has no value when adduced against "the doctrine of cortical functional centres." The loss of some brain matter in itself is not important, provided the loss does not involve some centre.

Sergeant Rotherham was "wounded by a ball, which penetrated the skull near the right frontal eminence, passed directly inwards, and lodged somewhere on the membranes or in the brain substance." This ball entered "near the frontal eminence." There are no centres in this locality to be destroyed. It is not stated where the ball lodged, whether in the membranes or the brain, nor the exact course taken by it. For purposes of deduc-

tions against the theory of cortical centres, this case also goes by the board.

Lieut. Brown "received a penetrating gunshot wound of the cranium and brain. The ball was removed seven years afterwards." It is not stated where the ball entered, nor where it was found when removed. The man got well, and had no bad results. Clearly no centre was touched in this case, just because the ball did not so enter the brain.

Private Stallman was wounded by a musket ball, "which entered at right temple and emerged at the opposite side of the head." The place of emergence is not stated. This is to be regretted, as it is just such exactness that renders such cases valuable. In this case the course taken by the bullet was above the face centre and in front of those for the eyes and head, consequently "he had no strabismus." This case again cannot be quoted as affording any ground to argue against the doctrine of cortical centres.

Private Haggart "was wounded by a conoidal musket ball, which struck the left side of the head, and passing through, carried away a large portion of the left half of the right occipital bone." The only symptom of any importance noted in this case is that there was some "dimness of vision." He made a good recovery. The amount of occipital bone carried off is of no moment. It is stated that he "lost more than an ounce of cerebral matter." This might have been guessed at; but even if he did it would not be of any weight against the doctrine of surface centres, provided the loss was from a part where a centre does not exist. Now in this case the course of the bullet was exactly where it could miss both cortical centres and cerebral tracts, by passing above those for vision, and behind those for motion. Clearly the course of the bullet did not come near the gyrus fornicatus nor hippocampal region, so as to involve sensation. This case is again one of the exceptions which prove the rule. No doubt the bullet passed very near the centres for vision.

"Sergeant Woodman was wounded by a gunshot missile, which entered above the left frontal eminence and emerged one inch behind the upper margin of the right ear." He is reported as having had no bad results from the wound, and was alive and well three years afterwards. Now let us look