

- (d) Herxheimer's Scharlach R. method, to examine for the earliest traces of fat degeneration, and to study their relations to the nerve fibres, glia cells, and blood vessels.
- (e) Marchi counterstained by Mallory, to facilitate the investigations of the changes in the later stages of the degenerative process, for the tissue unstained by the osmic acid is beautifully differentiated by the Mallory.

*Case I. (10 hours).—Captain A. Stokes, No. 1. Lab. R.E.F.*

The soldier was wounded by a hand grenade. One piece entered the right frontal lobe of the brain: there was no great hæmorrhage, though sufficient to fill the region of the pons with clot. A second piece entered the neck, divided the right vagus, opened the jugular, and went on and bared the transverse process of the fifth or sixth cervical vertebra. It did not penetrate into the canal. He lived about ten hours. The post mortem showed that the cord was apparently uninjured.

Bielschowsky preparations from the cervical region show that the axis cylinders throughout the greater portion of the longitudinal section are normal. Their course across the whole field is straight; the fibres, which are of an equal size throughout, show a slight waviness, but there are no sharp twists. In another region of the same section the axis cylinders are suddenly bent at regular intervals, but there is no swelling or breaking of the fibre.

Mallory sections show the twisting of the axis cylinder as well as a distinct globular swelling of the myelin sheath, which also presents in some fibres a granulated appearance. Some fibres show a distinct swelling of the axis cylinders at regular intervals. This is generally associated with fibrillation, and occasionally with partial rupture; no changes were observed in the neuroglia cells.

The Marchi method shows here and there, extended along some nerve fibre, a few small dark staining balls of myelin. From their small size and the fact that the Scharlach R. shows no fat reaction it is evident that they are the Elzholz bodies, symbolic of the normal metabolism of the central nervous system.