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A FEW NOTES ON CEREBRO-SPINAL PATHOLOGY.*

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The advancement of practical medical knowledge may not be very striking from year to year, yet, experience teaches that apparently insignificant facts may be followed by momentous results. The observations and experiments of Galen over seventeen centuries ago, on the recurrent laryngeal nerves and on the functions of arteries, led to the great discoveries of nerve function and blood circulation. The investigations in respect to the work of the lymphatics made in the seventeenth century, led to our present knowledge of their important place in the animal economy. Bell's researches into nerve structure and function, made nearly ninety years ago, were a great stride forward towards the better understanding of the workings of the cerebro-spinal economy. Magendie used Bell's data, and by adding them to his own observations, based on experiment, he came a step farther into the light of truth. Little did Tyndall dream that when he was experimenting with a sunbeam which straggled into his study, he was gathering material to prove the germ theory, and in *Listerism* to revolutionize the practice of surgery. Thus it always has been and always will be—one lays the foundation and another builds on it. One isolated fact may be a key to open a door into a veritable chamber of wonders. It is never to be forgotten, however, that theory is always to be received with caution, but experimental knowledge carries its own evidence with it. In this lies the great advantage of pathological research. Diseased organs with the signs and symptoms consequent thereon, have been studied closely during the past half of a century, with all the assistance chemistry, the microscope and micro-photography could give to the pathologist, nor have the observers labored in vain in this marvelous field of inquiry.

In 1840, Nasse discovered that after the division of a nerve, not only was the cicatrix after healing a different texture from that of the nerve divided, but that all the nerve from the cut part to its utmost extremity had changed in character. Atrophy, degenerated myeline, fibres changed in opacity and outline were always found to be the result of division in all the cut-off nerves. Ten years later, Waller not only corroborated this, but took a step farther and showed by actual experiment that not only did this change take place, but that regeneration to the normal condition never supervened. This was a great step towards a proper study of nerve decay, and especially of insanity in relation to permanent recuperation. A breach of continuity once effected in nerve tissue, either by disease or traumatic lesion, means irreparable loss of natural structure, and as a consequence loss in some degree of normal tone and function. We know that inflammation never leaves a structure as it found it. The interosseous substance of a fracture is always different from the normal bone. A scar is a good example of change of structure, and which always remains in this condition, having assumed a physiological habit in its abnormality. It is evident then that degeneration takes the direction of the functional activity of nerve fibres. These grand facts, springing from the study of a nerve cicatrix to a nerve—then from a nerve to the spinal cord—then from the cord to the medulla oblongata and white brain substance, have given us an insight into conditions the microscope could not divulge alone. These morbid changes show, on the one hand, the close intimacy of all nerve fibres; and on the other, the radical distinction of nerve tracts. Nerve fibres seem to lie alongside of one another like insulated electric wires, yet quite distinct from one another in function, until some point of *consensus* is reached in a nerve centre.

It will be seen also that a good deal of attention has been given lately to the connection nerve influence has with nutrition. It is asserted that certain parts of nerve centres have more peculiarly the functions of ennervating actions, which convey distinctive energies to focal points of assimi-

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