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## HEAD INJURIES.\*

BY

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It is my privilege to try to put before you certain ideas on head injuries as they occur to me, such as may help you to visualise the conditions that are present in any given case, and assist you in both diagnosis and prognosis. In view of the great frequency of motor-car accidents, and others of an analogous nature, it is absolutely essential in the treatment of the patient that we should be enabled to picture the conditions that are present.

### CONCUSSION.

Head injuries of any severity are almost necessarily followed by a period of concussion, the signs and symptoms of which state are well known. It is also, I think, unnecessary to discuss the various theories that have been advanced in explanation of the onset of concussion—all are hypothetical, and some are so fantastic as to merit no mention. It is infinitely preferable, I think, to consider certain outstanding features in all concussion cases, and to try to explain them, thus dealing with concussion from a more or less clinical point of view.

Under ordinary circumstances the brain receives that amount of arterial blood which is required to permit it to carry out its normal functions. I imagine that, in lectures such as this, and in all similar conditions, the brain-cells are hyperactive, encouraged for a special purpose by an extra flushing of arterial blood. Per contra, it can be assumed that, in concussion, in which state there is a sudden abolition of all conscious acts, of all voluntary action, of all knowledge, and of all

memory, that the vascular conditions of the brain are exactly opposite—in other words, that the brain is in a state of *acute arterial anæmia*. When endeavouring to explain, in a simple logical manner, this state of acute anæmia of the brain, I pin my faith in the effects of the injury on the medullary centres, and more especially on the vasomotor centre, the main function of which is to keep up our blood pressure. When this vasomotor centre is violently inhibited, or paralysed, there is a sudden and immediate great fall in blood pressure. The vessels of the brain possess no special vasoconstrictor or vasodilator nerves—they passively follow the changes in the general circulation. Consequently, in the event of inhibition, or paralysis, of the vasomotor centre, with subsequent great fall in general blood pressure, the arteries of the brain are deprived of their normal circulating blood, with consequent immediate loss of power and consciousness.

I would remind you that it is advisable, when estimating the gravity of any head case, to possess some simple form of blood-pressure apparatus, whereby the blood pressure may be estimated from time to time. Next, it is necessary to remember that the diminution in the amount of circulating arterial blood, within the cranial cavity, must be compensated for by a corresponding increase in the amount of venous blood—in other words, the development of acute arterial anæmia is immediately followed by an *acute engorgement of the cerebral venous system*.

If one tries to visualise the brain at this stage one would see a brain in a state of acute venous engorgement, all the veins full and turgid, and in the more severe case the blood almost in a state of venous stasis.

Next, let us turn our attention to the *cerebro-spinal fluid*. This fluid, whatever may be its function, is secreted continuously from the choroid plexuses of the ventricles, and, under normal conditions, it is absorbed into the cerebral venous

\* A Lecture delivered before the Fellowship of Medicine and Post-Graduate Medical Association on Dec. 9th, 1926.