

supposed to be due to external violence; but that this was the case could not be positively stated, since, during the state of distension of the blood-vessels in drunkenness, they are ill capable of resistance, while the blood itself is in a dissolved condition. The effects upon the brain do not arise from a simple excess of healthy blood, but of a blood which has undergone change, which in acute spirit-poison still contains the substance inducing this.

While the nervous system is stimulated and enfeebled through this changed condition of the blood, so also, in a reverse order, the blood, heart, and circulation are disturbed and enfeebled by the condition of the brain and nerves; so that here is a constant reciprocal mischievous influence of the blood and venous system going on, until the disturbance of the economy becomes complete, physical disease prostrates the body, and all controlling power and mental activity are destroyed.—*Henk's Zeitsch.*

## PHYSICAL SCIENCE.

### REMARKS ON THE HYDRO-ELECTRIC CHAIN OF DR. PULVERMACHER.

*By Golding Bird, M.D., F.R.S.*

The ingenious modification of Volta's pile, contrived by Dr. Pulvermacher, of Vienna, has attracted so much attention, that the following account of the apparatus, as a source of electricity, may perhaps not be uninteresting, at least to those who may not have had time to devote much attention to the study of these subjects.

Everybody is aware that the apparatus contrived by Volta consisted of plates of metals, differing in their respective affinities for oxygen, alternated with pieces of cloth dipped in a saline solution. Thus, in the most common modification of this pile, a plate of copper is placed on the table, on this a plate of zinc, and then a piece of flannel or cloth, dipped in a solution of common salt; on this a second plate of copper, and so on. The theory of the apparatus is so well known, that it is unnecessary to say more than that, under the chemical action of the saline fluid on the zinc, the combined electric fluids existing normally in both the two metals employed, are separated—the positive electricity being found on the zinc, and the negative on the copper surface. Wollaston's and Cruikshank's troughs are but modifications of the same contrivance—cells filled with the saline fluid replacing the moistened cloth or flannel. The cumbersome nature of these contrivances, the time required to excite them, the rapidity with which the intensity of the electric current diminishes, as well as the tact and management required to apply the current they evolve, have always presented most serious obstacles to their adoption into medical practice. On this account they have been almost completely replaced by the different machines for furnishing a current of induced electricity. These, it is true, possess many advantages, and become most important appliances in the treatment of disease, as has been repeatedly pointed out by myself and others. Still we have often found the want of an apparatus by which an uniform and uninterrupted current of voltaic electricity could be at our command at a short notice, and without involving the necessity of any manipulative tact in its application. The hydro-electric chain completely fulfils these desiderata.