

of hydrogen contained in a tube, with a piece of platinized platina in contact with the metallic salt : nitric acid and persalts of iron, on the other hand, yielded their oxygen by the influence of the same agent.

The general conclusion which he deduces from his experiments is that, when a metallic solution is subjected to voltaic action, water is decomposed, its oxygen passing in one direction, and its hydrogen in the opposite direction; the latter element performing at the moment of its evolution at the negative pole the same part with respect to a solution of sulphate of copper, that a plate of iron or zinc would perform to the same solution.

March 16, 1843.

FRANCIS BAILY, Esq., V.P., in the Chair.

William Brooke O'Shaughnessy, M.D., was balloted for, and duly elected a Fellow of the Society.

The following papers were read, viz.—

1. "On the import and office of the Lymphatic Vessels." By Robert Willis, M.D. Communicated by John Bostock, M.D., F.R.S.

That absorption is the special office of the lymphatic vessels was, until very lately, a universally received doctrine in physiology : but it is now admitted that if they exercise this faculty, it can be only to an inconsiderable extent ; and physiologists of high authority have even denied that they possess any absorbing power at all. This last is the opinion of Magendie, in which the author concurs. So lately as 1841, Rudolph Wagner asserted that "neither anatomical nor physiological considerations render any satisfactory account of the import and office of the lymphatics," which thus, shorn of their ancient office, were repudiated as a superfluous apparatus in the animal mechanism. The grand organs of absorption the author believes to be the veins ; and a principal object of his paper is to point out the mode in which they acquire this remarkable faculty. The principal condition which this faculty of imbibition implies, is a difference in density between the contents of the vessels which are to absorb, and the contents of those which furnish the matter to be absorbed. If the several constituent materials of the body, both fluid and solid, were to remain in the same unaltered state, both chemically and physically, there could be no interchange among them : in order that mutual penetration may take place between two elements, the one must differ from the other : that which is designed to absorb must be, with relation to that which is to be absorbed, more dense ; that is, must contain a smaller quantity of water in proportion to its solid ingredients. For the continuance of the delicate processes concerned in the access and removal of the nutrient fluids, it is necessary that a difference should be established between the arterial and the venous blood in respect of density. This purpose the author conceives is accomplished by the abstraction from

the former of a portion of its water by the sudoriparous glands of the skin on the one hand, and by the lymphatic vessels on the other.

That the separation of the lymph from the blood is calculated to increase its density, is proved by its chemical analysis; lymph containing from 96 to 97 per cent. of water, and blood from 77 to 82 per cent. The author regards this separation of lymph from the blood as the result of a purely vital process of the same nature as that by which the saliva and the watery portion of the urine are secreted from the circulating mass. He considers that his views are supported by the anatomical distribution of the lymphatic system: for, on the principle that organs are found in the vicinity of the places where their office is wanted, the office of the lymphatics must be general, inasmuch as the system is general. These vessels may, in fact, be regarded as the essential element of an universally distributed gland. The mode in which the lymphatics are finally connected with the blood-vessels appears also to indicate that the object in view is to keep their watery fluid separate from the blood as long as possible; for, as is well known, they do not transfer their contents into the neighbouring veins, but pour their whole fluid into the superior vena cava at the moment it is about to enter into the heart.

The remarkable manner in which the lymphatic system is developed in some of the lower tribes of animals, whose bodies are encased in an impervious horny covering, such as turtles, lizards and serpents, is adduced in further corroboration of the author's views. He regards the serous membranes as contrivances for the accommodation of a great number of lymphatics; and the intimate connexion which the function of these vessels has with the life and nutrition of internal organs he thinks is shown by the remarkable amount of disturbance consequent on inflammation, or other morbid condition of serous membranes. Finally, the author adverts to the influence which the difference of endosmotic capability engendered by the abstraction of a certain amount of water in the course of the circulation, (first between the blood corpuscles and the plasma in which they swim, and then between the liquor sanguinis and the containing channels,) must have on the capillary circulation, which he conceives it is calculated to facilitate.

2. "Further Observations on the descending fluids of Plants, and more especially the Cambium." By George Rainey, Esq. Communicated by P. M. Roget, M.D., Sec. R.S.

The author relates an experiment in proof of the sap descending from the upper to the lower part of an exogenous tree, through vessels which are continuous from the leaves to the roots; the course of these vessels being shown by the addition of a solution of iodide of potassium after they had taken up by absorption a quantity of a solution of acetate of lead. The fluids in these vessels are, he conceives, separated from the sap, which is ascending from the roots, only by the membrane of which they are composed. When the leaf-buds of a tree are vegetating, large separations are observable