REVIEW.

PRINCIPLES OF PHYSIOLOGY, GENERAL AND COMPARATIVE.—By William B. Carpenter, M. D., F. R. S., *Examiner in Physiology and Comparative Anatomy in the University of London: Professor of Medical Jurisprudence in University College, &c., &c.*

(*Continued from No.* 1.)

PRIMARY TISSUES OF PLANTS.

In the first number of the *Journal*, Oct. 1853, we pointed out that the vegetable cell-wall was in most instances composed of two layers of very different composition and properties. The inner, which appeared to be first formed, was called the *primordial utricle*, extremely thin and delicate, but most essential to the structure of the cell, and appeared to be an azotised compound, in all probability, of an albuminous nature; while the second appeared to be generated on the external surface of the primordial utricle, and to surround it; being composed of cellulose, a substance identical with starch; this might consist of one or many layers.

In the interior of the vegetable cell we find a granular matter, which is usually coloured; it is called the *endochrome;* it is this, with the albuminous covering or primordial utricle, which constitutes the true cells; in it are exhibited the phenomena which indicate the vitality of the cell, and the existence of a continual movement of the floating granules may be seen, carried along in a stream in the fluid contents of the cell. This motion appears to be confined to a viscid layer, which seems in close connection with the primordial utricle. In the aquatic plants among the *characeæ nayadaceæ* and *hydro-charidaceæ* we may observe this movement most easily; in some the current is so strong as to carry along with it granular masses of starch, chlorophyll and albuminous matters. Several distinct currents may exist in the same cell, and these may be observed to have a point of departure and return—a mass of granular matter attached to the cell-wall, termed a *nucleus* appears to be the centre of the vital activity of the cell. This movement would appear to exist in every vegetable cell, at a certain stage of its development, and its cessation would seem to indicate the arrest or termination of the formative powers of the cell.