new matter is added to it, and to receive the fluids or gases absorbed from without.

12. Its irritability renders it susceptible of the influence of light, heat, and similar external forces.

13. Its hygrometrical quality causes it to absorb water greedily when presented to it, an essential condition of vegetable life.

14. Its vitality keeps all these qualities in play, enables plants to digest and assimilate their food, and their various organs to perform their manifold functions. Nothing can more strongly mark the ignorance which some modern chemists betray of the facts of vegetable life than their denial of vitality, and reference of every phenomenon to chemical action. If they are right the motions of fluids, the construction of tissues, the decomposition of matter, and its combination in new forms, with the thousand other circumstances of vegetable growth, should go on as well in organized as is brute matter, provided their chemical proportions are maintained.

15. Its various forms are held together by an organic tissue; itself is generated. This mucus has received the name of intercellular substance, and also of cambium, when it is exuded by the parts of an already organized plan.

An objection may be taken chemically to this view but it seems to be physiologically correct.

16. Tissue occurs in the form of the cellular, the woody, the vascular, the pitted, and the laticiferous, the different modifications of which constitute the Elementary Organs.—*Lindley's Botany.*

ALLUVIAL SOILS.

I BEG to lay before you some experiments of mine on the draining of marshy land. It so happens, that I have a large quantity of this sort of land. When drained, it is perhaps the most valuable of any; it has sufficient strength to bear magnificent crops of wheat, and as, by being laid dry, it falls into a powdery state, easily worked, it will produce all sorts of roots, particularly mangel wurzel or carrots, to great advantage. But, if undrained, it is much the reverse of this; the wet lodging on its surface, it runs into a sort of putty-like cohesion; it is then little better than the strong clays under similar circumstances. Turnips, not drawn before the weather breaks, have been known to remain until they have become quite rotten, from its being impracticable to have them removed by carting. I will now mention a field of my own about 10 acres, which was drained many years ago, with horse-shoe tiles. On examining these drains last year. I found them entirely choked with sand. There were accordingly taken up, and the land was drained early last spring with what are called the D tiles. Some rough bad hay was placed upon the tiles, but on inspecting these after a crop of potatoes had been taken up, it was found that a considerable quantity of the sand had insinuated itself through the junction of the tiles, and it is believed that in 10 years these drains will be a little better than the former. To prevent the admission of sand into the tiles, two methods have been tried; one is the use of tiles with collars. This has been much practised by Mr. Josiah Parkes, at Drayton Manor, and elsewhere. The other method is to put a layer of clay on the tiles. If the collars fit very close, they may exclude the sand, but that is frequently of such a subtile nature, that there is always a danger of its penetrating through the interstices. A layer of clay is a more certain preventive, but then this is often not near at hand, and becomes expensive *in the carting.* Mr. Linton, in the Royal Agricultural Society's Journal, has given a good account of his draining a running sand in his manner, which has been entered in my "New Husbandry," p. 81. He says the tiles and bottoms should be laid as close to each other as possible, and on them should be placed a covering of about 4 inches of the most tenacious soil that can be procured. Clay would be used, but on account of its being in large lumps, it cannot be made sufficiently close to keep out the sand. Here I must observe that it is essentially necessary that the drains be cut 3 or 4 inches wider at the bottom than the width of the tile, so as to admit the strong soil down the sides to the very bottom; much mischief is done by the sand getting in at the bottom part of the joinings of the tile. Other materials have been used for keeping out the sand, when it can be got sufficiently loose and mallable, so as to bed quite close and firm, and leave no crevice. Straw and other perishable materials are to be particularly avoided.—*Agricultural Gazette.*

MANURING GRASS LAND.

Experiments are so numerous and well defined, as to leave but little doubt about the best select dressings. The nitrates and guano increase the produce of hay as well as grass. Salt and sulphates increase the hay from a given weight of grass, but do not give so much on the whole as the nitrates, &c. Nitrate of soda and nitrate of potash mixed—nitrate of soda and sulphate of soda mixed—nitrate of potash and sulphate of soda—have each given large produce. Sulphate of ammonia has produced very heavy crops: but it is not recommended for milk pasture, as spoiling the cream. Salt would probably correct this, and would supply alkali. Soot and guano have been each very productive, and improved by salt; guano by gypsum also. In many of the most successful experiments, much more compound mixtures were employed than those quoted under our several headings; and for which the inquisitive reader must refer to the original papers, as they would