

tervals. By adopting this mode, the lime is kept nearer the surface and more uniformly distributed to every part of the soil, so that every fibre of the roots of the growing plants can have its due supply, and all the matters of the soil are more likely to be continually acted on.

The shell marls so bountifully dispensed over a considerable portion of our State below tide water, have an important bearing upon the agricultural prosperity of our tide water districts.

They consist of marine shells mixed with sand or clay, and their value is in proportion to the amount of shells they contain susceptible of being readily disintegrated. When they consist principally of hard shells it might be advisable to calcine them if good marl cannot be had. The marl should lay on the surface one or two years, (according to the condition of the shells,) before being ploughed in, in order that the shells may be crumbled to powder, or as nearly so as possible. The composition of our marls vary so much, that no rule can be laid down as to the quantity proper to be applied; all we can do is to refer those interested to the reports of Professor Ducatel, the late State Geologist, in which they will find much valuable information.

It has generally been supposed by those cultivating limestone lands, that the calcareous principle was not wanting in them. Believing that this opinion is founded in error to a great extent, if not entirely, it may not be deemed entirely out of place in concluding this subject, to recommend the use of lime upon them, unless chemical analysis should shew a sufficiency of it in the soil.

SECTION 7.—*Of the value of lime compared with common manure.*

Chemical analysis shows that common barn yard manure contains all the ingredients that enter into the composition of plants, and if the dung of all the domestic animals on a farm be mixed together, the mineral constituents will be found about in the proportion required by our cultivated crops. This is the reason why it is applicable to all soils, and in every climate.

The committee know of no means whereby the comparative value of lime and common manure could be ascertained. The action of common manure lasting only some two or three years, whilst that of lime is prolonged to 20 or 30 or more years.

SECTION 8.—*Of sulphate of lime, or gypsum.*

Although not directed by the order of the House, to make an enquiry into the uses or effects of lime in this form, we take leave to submit that Professor Liebig says, that the action of gypsum "depends only upon its fixing in the soil the ammonia of the atmosphere, which would otherwise be volatised, with the water which evaporates. The carbonate of ammonia contained in rain water is decomposed by gypsum, in precisely the same manner as in the manufacture of sal-ammoniac. Soluble sulphate of ammonia and carbonate of lime are formed; and this salt of ammonia possessing no volatility is consequently retained in the soil. All the gypsum gradually disappears, but its action upon the carbonate of ammonia continues as long as it exists." This as we believe well