

EDITORIAL DEPARTMENT.

IMPROVED AGRICULTURE.

IT is cheering to the agriculturist of this day to notice the great strides which have occurred in Agriculture and Horticulture. The last thirty years seem to have culminated in a more full application of the sciences to these pursuits. We have waded through the different theories, first of Liebig and next of the various candidates for fame who have presented contradictory views, and all of whom have been mainly instrumental by their failures in establishing the once novel, but now admitted truths of the great chemist. No less useful have been the applications of natural laws illustrated and rendered understandable from the observed effects arising from underdraining and subsoil plowing. These have enabled the empirical farmer to know where moisture should be looked for when absent from his soil. He has found it dilate in the atmosphere, and he has also found that when this atmosphere could find its way through his soil to such depths as to bring it in contact with the surfaces of particles colder than itself, that the moisture would be deposited upon these surfaces; which in turn are properly prepared for all those chemical actions consequent upon the presence of both moisture and atmosphere. He has further learned that moisture so obtained contains large amounts of ammonia, and that water containing ammonia is capable of dissolving an increased amount of such inorganic matters as give strength to plants, and which are again yielded up by their ashes. He has also learned that all the organic matters in the soil which have ceased to grow under such conditions as above named, readily decompose and yield up their inorganic portions as pabulum for surrounding crops. This very decomposition also furnishes increased chemical conditions for action on the less progressed portions of the soil itself. All these enable him to surface plow more deeply in a soil progressed to great depths by underdraining and subsoil plowing. Thus increased depths of surface soils are formed, and increased crops are a natural consequence.

The more spirited operators are fast learning that no farm will produce as much manure as may be used with increased profit; and now instead of American bones

being exported to England and elsewhere, they are all used in the manufacture of superphosphates, and in the form of ground bones. This fact alone is of greater advantage to our country than is all the gold furnished by California. The spirit of inquiry as to the relative value of all wastes shows a more full appreciation for the necessity of an increased amount of manurial matter. Farmers begin to comprehend that common salt is composed of chlorine combined with an alkali, both of which are called for to complete the necessary pabulum of plants; and dirty and refuse salt from the packing houses, tanneries, etc., which formerly sold at four cents a bushel, now sells within two cents per bushel of the price of the merchantable article. When properly combined with lime, the chloride of lime and carbonate of soda may be formed from common salt; and this, when composted with inert inorganic matter, insures its rapid decomposition, fitting it for the use of the soil. Thus all deposits of low lands receive from the surrounding highlands during all time, and including many of the extensive marshes, are again brought into use for the highlands from whence they came,—while increased chemical actions in the soil, from the presence of chlorine, lime, and soda, together with all the inorganic matter of these vegetable deposits, go to perfect conditions such as always follow the application of manurial matters.

Chemists have been taught to believe that chemistry was an exact science, and therefore they slowly yield to the truth so readily noticed by the farmer, that the same inorganic constituents which are furnished to the soil from the decomposition of organic matters, and which cause increased amounts of growth, if taken from lower sources in nature—such as the rocks—will fail to produce the desired results. Thus the farmer has found that superphosphate made by treating bones and other organic matters has high value. He has also found that bird dung, in the form of guano, and containing large amounts of phosphate of lime, is valuable, while those miscalled guanos, which have been so highly recommended by few chemists, and made by grinding phosphatic rocks and volcanic phosphates, have no value. And now we are glad to say that many of our first chem-