of barium. It is impossible to foresee all the results of this great discovery. Among other things, it suggests the production of nitric acid from the air by oxidising ammonia.—*Irish Agricultural Review.*

GUANO.—M. Boussingault, to whom we are indebted for many valuable contributions to the literature of agriculture, has recently presented a paper to the French Academy on the origin and nature of Guano, from which we extract the following:—

The deposits of guano (*huano de pajaro*) extend from the 2nd to the 21st degree south latitude along the coast of Peru. Those which lie beyond these limits are much poorer in ammoniacal compounds than the former, and are not, therefore equal to them in value. Guano is generally found deposited in small promontories or on cliffs; it fills up crevices, and is in general to be found in those places in which the birds seek shelter. The rocks of this part of the coast consist of granite, gneiss, syenite, and porphyric syenite; the guano which covers them generally exists in horizontal layers; but sometimes the latter have a strong inclination, as at Chipana for instance, where they are nearly vertical.—The guano deposits are generally covered with an agglomeration of sand and saline substances, called *eatiche*, which the labourers first remove before they begin the attack on the guano. In some places, as at Pabellon de Pica, and at Punta Grande, the deposits lie under a mass of sand descended from the neighbouring mountains; and on this subject an observation made by M. F. de Rivero is extremely curious. At the places above mentioned the lowest guano deposits are covered with a stratum of old alluvial soil; then comes another layer of guano, and then a stratum of modern alluvian soil. To understand the importance of this fact, our readers must keep in mind that the age of modern alluvians does not extend beyond our historical times, while old alluvians date from the period immediately preceding that at which man first began to inhabit the earth; so that the guanaes, or cormorants and other allied tribes of birds which deposit guano, must have existed thousands of years before man, seeing that the inferior layer of guano is several yards (sometimes from 15 to 20) in depth, and the old alluvian crust above it has a thickness of upwards of three yards. To explain the immense accumulation of guano in those regions, M. Boussingault observes that there has been a combination of a variety of causes favorable both to its production and preservation. Among these causes must be reckoned a dry climate; a ground presenting a vast number of chinks, fissures, and caverns, where the birds can rest, lay their eggs, and hatch them without being disturbed by the strong breezes from the south; and then abundance of the food suited to them. No where are fish so abundant as on this coast, where whole shoals of them are cast upon the shore even in fine weather. Antonia de Ulloa states that anchovies especially are in such abundance here as to defy description; and he gives a good account of the manner in which their numbers are diminished by the myriads of guanaes which are seen sometimes flying in countless flocks, like clouds intercepting the sun's rays, and sometimes darting into the sea to catch their prey. According to M. Boussingault's calculation, 100 kilogrammes of guano contain the nitrogen of 600 kilogrammes of sea fish; and as the guano deposits, before they began to be worked, contained 378,000,000 of metrical quintals of guano, the birds must have consumed 2,268,000,000 of quintals of fish.—*Irish Agricultural Review.*

Horticultural.

Fruit Growers' Association of Upper Canada.

We had expected to have been furnished with a special report of the recent meeting of this Society at Hamilton, but not having received at the time of going to press, we make use of the following communication and report supplied to the Toronto *Globe* by our friend D. W. Beadle, of St. Catherines:—

This Association held its general annual meeting on the 16th and 17th January, at Hamilton. The officers chosen for the ensuing year are as follows:—President, Judge Logie, Hamilton; Vice Presidents, George Leslie, Esq., Toronto, D. W. Beadle, Esq., St. Catherines; Secretary, J. Hurlburt, LL.D., Hamilton; Treasurer, John A. Bruce, Esq., Hamilton; Committee on Orchard Fruits—Messrs. Leslie, Beadle, and Murray; Committee on Small Fruits—Messrs. Arnold, Gray and Meston.

The objects of this Association as expressed in its constitution, are the advancement of the science and art of fruit culture, to be accomplished by holding meetings for the exhibition of fruits, and for the discussion of all questions relative to fruit culture, and likewise by collecting, arranging, and disseminating useful information in relation thereto.

To this end, every one who cultivates fruit in any part of the Province, even though in ever so limited a way, is urgently solicited to become a member and to contribute the results of his experience. The adaptedness of different varieties of fruit to different localities, and especially the hardiness with which they withstand the severity of our climate, are subjects of the greatest interest, and could the information on these points alone, which now lies scattered about through the Province, be gathered up