

appearance somewhat resembling porcelain, but is usually coloured more or less by organic matter. Generally it is very hard, and strongly cohesive, though sometimes friable, and it lies unevenly on the surface in rough fragments that are warped and curved by the heat of the sun. It consists chiefly of phosphoric acid and lime, but, owing to the variable amount of sulphate of lime, with which it is mechanically mixed, there is a lack of uniformity in different samples. Hence the percentage of phosphoric acid varies from over 50 per cent. to less than 30 per cent.

The gypsum or sulphate of lime is usually soft and amorphous, sometimes crystalline, and, at a depth of eighteen inches or two feet, occurs in hard, compact, crystalline beds. It is of a light snuff colour, and, where it underlies guano, is mixed with considerable phosphate of lime, which has been washed down from the surface. Similar deposits of sulphate of lime occur on many other elevated lagoon islands of the Pacific.

Starbuck's, Starve or Hero Island, is an elevated atoll, and is worthy of mention, because like Jarvis's, McKean's, and other islands of similar structure, it contains a large deposit of gypsum. Its supposed guano I have found to consist of the hydrated sulphate of lime, containing about twelve per cent. of phosphate of lime, and coloured by a little organic matter. So far as my observation extends, all elevated lagoons have similar deposits of gypsum.

As regards the distribution of these phosphatic guano deposits, I believe them, in this region of the Pacific, to be confined to latitudes very near the equator, where rain is comparatively of rare occurrence. In latitudes more remote from the equator than 4° or 5° , heavy rains are frequent, and this circumstance is not only directly unfavourable to the formation of guano deposits, but it encourages vegetation; and when an island is covered with trees and bushes, the birds preferring to roost in them, there is no opportunity for the accumulation of guano deposits.

An article in the same Journal (vol. xl., 1865) by A. A. Julien, gives an account of the various phosphatic minerals