

quantity. The value of the whole being equal to the united value of the several parts necessary to make up that whole.

There are several other constituents in Guano besides those first mentioned—a little plaster of Paris, a smaller quantity of common salt, &c., but these are in such small quantities as not to be worthy of consideration, because they can be very easily supplied from many sources. The statements which I made upon this subject when last addressing your honorable body I still adhere to, for they have been since confirmed by repeated observation, by the concurrent testimony of many practical men, and borne out by other high authorities than those given at that time. I then said:

“Notwithstanding the various compounds which enter into its composition, yet its value almost entirely depends on two of them. On the ammonia already present in it as a salt, with that which is capable of being formed by the decomposition of its azotized matter, and on its phosphoric acid or phosphates, which are combinations of this acid with some base. The small quantity of the other substances in it possess no particular value, as they can, if needed, be supplied much cheaper from other sources.

Does the value of guano depend on its ammonia which it already may have, or which may be formed in it, and its phosphoric acid or phosphates? We have, in support of this, a unity of sentiment amongst the ablest chemists. Liebig, Ure, Johnston, and indeed nearly all who have written on the subject, agree in the opinion that guano owes its value to its ammonia and phosphates. These two substances *must* give guano its value, or nothing else does, for, take away these two, and only a moiety of other matters remains, which can be cheaply obtained from many sources.

Not only are these substances the cause of the value of guano, but as either may exist in greater or less proportion, in any particular specimen, it makes that specimen better or worse for particular soils. Ammonia is supplied to plants in large quantities from the atmosphere, being absorbed by soils, and, with iron and clay, forms “true salts.” But if any particular soil has not this absorbent capacity, and has a deficiency of iron and clay, it cannot obtain ammonia from the usual source of supply, and will be unproductive, unless it be supplied from some other source. If guano is used, then, the purchaser should know which of the different lots contains the most ammonia. But many soils have the capacity to supply themselves with ammonia, but are deficient in phosphates, and therefore barren, and if the owners of soils find it more convenient to buy guano than any other manure, they should know what specimen contains the largest quantity of phosphates, what samples contain the most of what they want. If the purchaser does not know, would he not be constantly liable to loss in buying the wrong specimen? If it even acts well, he is not assured that another specimen would not have acted better. If, on