is the result; to me, or to any unprejudiced person I should think, conclusive. Mr. P. states, moreover, that the plaster must have 500 parts of water or it will not act—the above shows this quantity to be unnecessary. Baron Liebig,* upon this subject says:

"Moreover, it is known to every tyro in Chemistry that thousands of cwts. of sulphate of ammonia have been made by simply bringing powdered gypsum into contact with *carbonate of ammonia.*" So confident a statement from so high a source is unquestionable.

I invite all who are competent, and who doubt the above facts, to make the experiment for themselves; it will save a great amount of useless talk and useless writing. If the practice of mixing sulphate of lime with ammoniacal manures is useless, let the fact be proved and the custom abandoned. If on the other hand it preserves their most valuable part from loss, certainly it should be adopted. That it does this, the testimony of the highest authority, as well as the evidence of my own senses prove. I therefore recommend that plaster should always be mixed with guano as soon as the guano is received, and that plaster should be always applied to stables, to barn-yards, to privies, and wherever animal or vegetable matter is undergoing decomposition. Let it be applied to secure the value of the manure, and to preserve the health of the animals in contact with it. The proper quantity to be mixed with guano must next be considered. *This must be in proportion to the quantity of ammonia in the guano.*

Chemical substances always unite in definite proportions. These proportions are called combining numbers. The combining number of ammonia is 17.19, i. e. 17.19 parts of ammonia always combine with a particular number of parts of whatever substance it unites with. The substance in plaster of Paris that unites with ammonia is sulphuric acid, its combining number is 40.10, and in whatever connection it is found, there is always this number of atoms of sulphuric acid; 17.19 parts of ammonia then, always unite to 40.10 parts of sulphuric acid, to make sulphate of ammonia. In order to convert the ten parts of ammonia into sulphate of ammonia, let these parts be grains, ounces, or pounds, it matters not—there is required 23.3 parts of sulphuric acid, and it will require 50.34 parts of pure gypsum to furnish this sulphuric acid, because gypsum, which is really a hydrated sulphate of lime, is composed of

Sulphuric acid,	40.10—1	equiv.
Lime,	28.50—1	"
Water,	18.00—2	"

And it will therefore take 86.60 parts of gypsum *to fix*—that is, to convert into sulphate, 17.1 parts of ammonia. Take, then, guano

* Familiar Letters, Page 499, London Edition.