

The classification of natural phosphates of lime is, as remarked by Dr. Penrose in Bulletin No. 46 of the U. S. Geological Survey, "a matter attended with many difficulties, not only on account of the great variety of forms in which phosphate of lime occurs, but also because many varieties blend into one another, thus often rendering it uncertain to which class a special deposit should be referred," and he adopts the following classification, based mainly on the chemical composition of the deposits, and grouped under the headings thus :—

Mineral Phosphates	{ Apatites	{ Fluor-Apatites
	{ Phosphorites	{ Chlor-Apatites
Rock Phosphates	{	Amorphous nodules { Loose nodules.
		Phosphoric limestone beds { Cemented (conglomerates)
		Guanos { Soluble guanos
		Bone beds. { Leached guanos

We shall recognise as we proceed with the study of the various phosphatic deposits, formed during the different geologic periods, that by far the greater part owe their origin to animal or organic remains, and we shall see that as soon as the organic compounds of a guano, for example, are dissipated and resolved into their elements, we may consider that the residual products, to all intents and purposes, revert to the mineral state, in accordance with the familiar expression "earth to earth."

We pass over, for the present, the guano of various localities, which however will be observed to lie mostly within 10 to 20 degrees of the equator.

We should remember, however, that this product has attained its zenith, both as to quality and quantity, and must cede its commercial importance ultimately to the mineral resources of phosphoric acid, which are before us for our more particular consideration.

We shall find the diagram on the wall which shows the approximate geological position or age of the different phosphate deposits, very useful to our present purpose, and we will commence with the more recently formed or mineralized products.