

2. *Elephas primigenius*.

The only known specimen found in the county was a tooth unearthed in a gravel pit one-half mile south of Wailesboro in 1898. It was covered with seven feet of soil and gravel. Weight, nine pounds. It was destroyed by fire in the office of Dr. Webster Peck, at Frankton, Indiana. Identified by the writer. See Columbus, Ind., *Home Advocate* of September 9, 1898.

3. *Cervus americanus* (Harlan).

Extinct elk. Post pliocene fossil. The specimen is the *Os frontis* to which is attached the antler with two branches. Present length two feet, weight five pounds. When found it measured over seven feet in length and was then incomplete. By handling it has crumbled to its present length. Found in White River one mile east of Wailesboro. Identified by the writer. A meager description appeared in the *Columbus Herald* of January 15, 1901.

4. *Cervus virginianus*.

Virginia deer. Sub-fossil. Specimen is the right frontal appendage (antler). Found in Wayne Township in 1898. Identified by the writer.

ORGANIC ACID PHOSPHIDES.

P. N. EVANS.

Phosphorus in the organic phosphines shows such a perfect analogy to nitrogen in the amines, that it seems strange that we should not be familiar also with the phosphorus analogues of the acid amides—which we may appropriately call *phosphides*. Of this class of bodies no mention is made in most books on organic chemistry, and an examination of the literature shows only two of these substances to have been prepared and very superficially investigated, namely, mono- and tri-chlor-acetyl phosphides, dating back to the seventies.

With a view to preparing other representatives of this class and examining them, the methods used to make the acid amides were considered as to their applicability; the reaction between hydrogen phosphide (PH_3) and acid chlorides seemed to be the most promising by which to attempt to prepare new acid phosphides.

Preliminary experiments were made several years ago with some of the simpler acid chlorides, but the very imperfect absorption of the phosphine, and the formation of solid hydrogen phosphide seemed to make the attempts unpromising, and the subject was dropped for a time.

A year ago, with Charles E. Vanderkleed, the subject was taken up again, and dichlor-acetyl chloride selected as the acid chloride to experiment with first, since the reaction had been shown to take place with the chlorides of mono- and tri-chlor-acetic acids. The reaction proceeded satisfactorily, though slowly, and the originally liquid chloride gradually thickened to a thick, yellow, transparent mass, from which by solution in alcohol and precipitation by ether a fine crystalline powder was obtained, giving on analysis figures for phosphorus and chlorine corresponding to the phosphide expected, $\text{CHCl}_2\text{COPH}_2$.

This substance is extremely soluble in alcohol, insoluble in ether, chloroform, and petroleum ether, insoluble in but soon decomposed by water, especially on warming, with the formation of hydrogen phosphide (PH_3) and dichlor-acetic acid, judging by the odor. It is quite stable in dry air and chars without melting at about 200° centigrade. Its behavior is what might be expected from a comparison with the amides, especially its greater tendency to decompose with water, on account of the more weakly basic character of phosphine compared with ammonia.

Experiments are being now made by Miss Frances M. DeFrees on the preparation and properties of benzoyl phosphide, $\text{C}_6\text{H}_5\text{COPH}_2$, and a crystalline compound has been obtained, charring without melting, and showing similar solubilities and decompositions to those of the dichlor-acetyl phosphide.

ADSORPTION OF DISSOLVED SUBSTANCES.

P. N. EVANS.

The term "adsorption" is used for the attraction exerted by a solid surface on gases or dissolved substances. With regard to gases, the effects are familiar in the action of porous solids, such as charcoal, which seem to condense gases within the pores as if under considerable pressure; the action is a selective one, however, for in the case of charcoal some gases, ammonia for instance, are very much more affected than others. The numerous chemical reactions taking place in the presence of such porous