

if it does so, a solution under the protective agency of a combination in oil globules, which by emulsion in the intestinal tract, pass into the chyle, is the most rational. Whether its ultimate effect in the tissues be as phosphorus, or as phosphorus acid, must still be very doubtful, when it is remembered that before reaching the tissues, it is ærated in the lungs. That phosphorus can never be effectively employed but in its free and most active state (Thompson, p. 9) is abundantly disproved by the experience of this country, and especially by the systematic observation in large hospitals for the insane, see especially a paper on "the Physiological action and Therapeutic uses of the Acidum Phosphorium dilution" by Judson B. Andrews, M.D., assistant physician in the New York Lunatic Asylum" published in the American journal of Insanity for October, 1869. In regard to the specific action of phosphorus upon the bones, Wagner says "For the therapeutic application it is in general more advisable to make use of the phosphorus in substance than the phosphorus in phosphoric acid. If any considerable action is to be developed by the two latter preparations they must be used in doses which, in animals, at least disturb the digestive apparatus to a high degree." The officinal (U. S. P.) dilute phosphoric acid is very efficient in doses of 20 m=1.25 cc to 30 m 18.75 cc given three times a day, such doses contain in the first about 0.65 grs=45 milligrams; the second about 0.98 gr.=68 milligrams of phosphorus. The equivalent doses of uncombined or free phosphorus should be about 1.60 to 1.40—to 1 1½ milligrams. Therefore the quantity of phosphorus given in the condition of phosphorus acid is nearly 50 times greater than when given as free phosphorus to produce an equivalent therapeutic effect, provided the effect be the same, and not 800 to 1000 times greater, as in Wagner's experiments on the lower animals, to obtain his effects upon the tissues. This part of the subject is much in need of closer investigation, and it is to be hoped that Dr. Andrews, or some other careful observer, who may be equally familiar with the uses and effects of phosphoric acid, will compare it with free phosphorus, and give the result to the profession when some means of accurate dosing of free phosphorus is afforded, as by the note. Referring them to the numerous authorities for what has been written on the subject of the effects and modes of administration of free phosphorus, it is here proposed to dismiss all the formulas for its administration, except that which up to the present time may be conceded to be the best, namely its solution in cod-liver oil, and to do so formulate and elaborate this mode of administration that it may afford a safe and uniform practice, as a basis for more accurate observation and more exact experience; and may enable the physician to prescribe, and pharmacist to dispense the substance accurately and conveniently, in any dose, as with other articles of the *Materia Medica*; the object being to get the phosphorus into the stomach without oxidation, and yet in a condition to be all readily