

phuric ether, and obtained by spontaneous evaporation a fatty viscid matter, of a brown colour, sickly odour, and acrid taste. A scruple of this matter in emulsion with milk of almonds and a little gum produced no vermifuge effects. I should, however, recommend further trials of it.

PHOSPHORUS.

The internal and local applications of phosphorus in medicine occupied M. Sedillot's attention for many years. In the second volume of the *Littérature Médicale Etrangère*, which he published in 1799; and in the *Journal Général de Médecine*, the first sixty volumes of which he edited, as many memoirs on this remedy may be found as would give its complete history. Of these the following is a brief summary.

Sedillot's first notions on the subject were obtained from a thesis in Haller's collection, entitled, *De Phosphori loco medicamenti, aliquot casibus singularibus conformatâ, Auctore J. G. Mentz, 1751*. Previous to this date very little is stated by authors concerning phosphorus. The first case quoted by Mentz was one in which, after a malignant petechial fever, an obstinate diarrhœa, with intense anxiety of the præcordia, delirium, and general prostration of the powers had supervened. Two grains of phosphorus made into a bolus with confection of opium, were administered, and immediately produced quietude, sleep, and gentle perspiration. At night and the following morning an addition of one grain was made to the dose. The transpiration was then copious, and had a sulphurous smell; and in a short time all the functions were re-established. The second case was one of extreme prostration after bilious fever. In this six grains of phosphorus in conserve of roses were given in two doses in the course of the day. An entire night's sleep and an abundant perspiration worked a cure. In the third case there was

delirium and general debility, consequent on a malignant catarrhal fever: the same doses, as in the last case, produced similar effects.

Morgenstern, (*Schulzii Prælect. in dispensat. Brandenb.* 1753,) and Hatman, (*Dissert. sistens spicileg. ad phosphor. urinæ usum internum pertinens.*) have also lauded this powerful remedy.

In an inaugural dissertation at Göttingen in 1791, Wolf records twelve cases, extracted from his father's journal, on the use of phosphorus. The results were almost wonderful. According to him the dose is as much as 2 or 3 grains, dissolved in a few drops of ether; but it will be afterwards shown that there is some error here regarding the dose.

In the London Medical Review for 1799, cases are related which show that phosphorus is one of the most potent of the alexiteric and alexipharmic remedies, and that it has been employed with success in instances where vital action was nearly extinguished; but that too much caution cannot be had in its administration.

In the Bibliothèque Britannique, Conradi, a physician at Northeim is stated to have used phosphorus in the after-stages of malignant fevers, when the symptoms betokened the near approach of death. In seven such cases, in which it was used, four were happily cured; and though in three others the patients did not recover, they, nevertheless, were considerably relieved by the remedy.

Mandel mentions the efficacy of phosphorus in atonic epilepsy; but the cases he cites are not conclusive.

Hufeland has observed the good effects of phosphorus in a case of obstinate gout with concretions, in which the medicine caused profuse sweats; in a case of slow poisoning by lead and arsenic; and in one of marasmus which threatened the life of the patient.

Amid all this successful practice Weickard has recorded cases and experiments that should warn practitioners against the rash administration of this remedy. He cites three instances of death caused by its employment, both internally, in large doses of

3, 4, 5, and 6 grains, and externally in frictions, combined with some fatty substance. On inspection after death gangrenous patches were seen in the stomach. The same was observed in a dog that had been made the subject of some experiments.

In the first volume of the *Memoirs of the Société Médicale d'Émulation*, Alphonse Leroy relates an experiment on himself, which had nearly proved fatal. Having seen that the Germans gave as much as 12 grains in the course of the day, he took three grains mixed with confection of opium. He repented of the act when he recollected that there is sufficient air in the stomach to produce inflammation of such a substance as phosphorus, and thus cause a perforation of that organ. For two hours he was in a critical situation, and took repeated quantities of very cold water, until the uneasiness passed off. His urine became very red. On the following morning his muscular power was doubled, and he experienced a most intolerable venereal irritation. This last phenomenon was exhibited as follows, in the laboratory of Bertrand Pelletier. A drake and several ducks having drunk from a basin containing a solution of phosphorus and copper, died; but the male bird had such an irresistible propensity to tread the females, that he died the first. For the rest, M. Leroy has been very successful with this remedy, and considers it one of the most powerful in medicine. Other French practitioners have also employed, and testified to the remarkable effects of phosphorus.

In 1802 the father of M. Gaultier de Claubry published four cases, illustrative of the beneficial effects of phosphorized ether in paralysis and atony, with infiltration. And Mr. Gumprecht has inserted in the *London Medical Repository* for 1815, two instances of the efficacy of phosphorus in paralysis.

In that year also appeared the work of Daniel Lobstein, the aim of which was to point out the diseases in which phosphorus and its various preparations might be used, and to fix the doses and best mode of administer-

ing them. After some chemical disquisitions on phosphorus, he cites cases of his own, and from other authors. Though a man of great information and sense, he nevertheless appears to incline to the marvellous; for, according to him, the remedy would seem to have effected actual resurrections. He states that the diseases in which it has been administered with the greatest success, are ataxic and adynamic fevers, (nervous and typhoid,) obstinate intermittents, rheumatic and gouty affections, amenorrhœa, chlorosis, &c.

M. Lobstein has also seen great benefit arise from the internal use of phosphoric acid in the dose of 20 or 30 drops in a glass of sugared water, taken every three hours, in pulmonary consumption, provided no inflammatory complication was present. A draught of milk should be taken after each dose.

The recent discoveries of M. Couerbe of the presence of phosphorus in the brain matter, adds to the therapeutical interest that may be attached to this medicine.*

Dr. Hacke, of Stralsund, has employed this medicine in a case of ulcerated womb; the quantity and fetid odour of the discharge were both very shortly checked.

Bertrand Pelletier relates the case of a man who had been immoderately given to venery, and had all the symptoms of dorsal phthisis, being exhausted to the last degree. He was treated with a mixture composed of phosphoric acid and honey, and in a very short time recovered his strength and plunged into his former course. Alphonse Leroy has known individuals who were in the habit of using, from time to time, a lemonade composed of phosphoric acid, sugar, and orange-flower water, which they considered as a means of preserving their health and strength, and even of prolonging their lives. He often gave this lemonade in malignant fevers, and preferred it to the sulphuric lemonade.

* I do not see the *sequitur* in this sentence: physiological considerations may, however, render it very clear to M. Magendie. See my annotations after the article 'Urea.'—Tr.

M. Sedillot has seen astonishingly rapid cures of the worst scrofula, with caries, effected by phosphoric acid. In atonic palsy, debility, and chronic rheumatism, occurring in weakly habits, he has always seen benefit derived from frictions with phosphorized ointment, repeated each night and morning. Care must be taken, however, even in such cases, not to extend its administration too far, for in the contrary event a general painful, and often intractable erythema is apt to be suddenly excited.

Preparation of Phosphorus, and manner of employing it.

No preparation of phosphorus in a solid form can be trusted; for either there is an entire combustion, and then the effect is uncertain, or the combustion is incomplete, and then the doses cannot be calculated upon; or, lastly, combustion does not take place at all, and then the remedy becomes dangerous. Under this category may be placed all the English and German preparations, which hold the phosphorus suspended in linctus, emulsions, confections, the luminous pills of Kunckel, the phosphorized powder of Leroy, &c.

Bertrand Pelletier, astonished that Conradi should be able to dissolve as much as four grains of phosphorus in a gros of ether, while Hufeland was unable to get more than eight grains dissolved in an ounce of the same fluid, made repeated trials, which ended by obtaining the same results as Hufeland; but in order that there should be some uniformity in the quantities in solution, and to be administered, he reduced to six grains the proportion of phosphorus contained in each ounce of ether.

His process consists in placing six grains of phosphorus, cut into small pieces, into an ounce of sulphuric ether, rectified to 65° of Cartier's areometer, and occasionally shaking the mixture for three or four days.

The dose of this preparation is 10 or 15 drops in a glass, in some mild drink or in a mixture, so given, as that the whole quantity taken in the space of three or

four days, shall be from 120 to 150 drops: this is generally sufficient to effect a cure.

This fluid may also be used for frictions when these are considered necessary.

M. Lobstein adds the essential oil of cloves to M. Pelletier's preparation; but Sedillot remarks that this, whether with or without addition, is not preferable, for the phosphorus in it is still luminous. The same may be said of a solution of phosphorus in any essential oil.

On this point M. J. Pelletier thus expresses himself (Journ. Gén de Méd. T. 59.) "All the phosphorized preparations in which the phosphorus is not in a complete state of division, are dangerous. Among such may be classed the preparations in which the phosphorus is only dissolved in a volatile substance, such as ether and the essential oils, inasmuch as in these instances, the exposure to air and heat, by volatilizing the solvent, sets the phosphorus at liberty, which is then liable to inflame by any degree of heat or friction. But the fatty and fixed oils are not liable to this objection, and this for the contrary reason: moreover, should they be absorbed the phosphorus is absorbed with them, being in a state of actual solution. I am not aware of Lescot's method for dividing or dissolving phosphorus; I only know as Morelot says, that he makes use of a compound of hydrogen, oxygen, and carbon, not to say a non-azotized animal or vegetable substance. Meantime, I doubt not the excellence of the plan, and only desire that it should be published."

M. Sedillot communicated Lescot's plan to me some years ago, having previously disclosed it to his son, resident at Dijon, and to M. Caventou; it is as follows:

Scented Phosphorized Oil.

Phosphorus 1 once.
Olive, or sweet almond oil.. 1 livre.

Cut the phosphorus into very small pieces, introduce them into a well-stopped bottle and add the oil.

Leave them together for a fortnight at the ordinary temperature in a dark place; then decant and scent it with oil of bergamot. Keep it for use in a bottle with a ground glass stopper, and in the dark. It is, I think, advisable not to prepare so much at once.

Twenty-five or thirty drops of this oil may be given internally every twenty-four hours, in mixtures, emulsions, or mucilaginous drinks, for four or five days consecutively.

For external use an ointment may be made by adding a fit proportion of the above to refined lard, and this may be used in friction, morning and evening, from four to ten days together. This ointment not unfrequently becomes luminous during the friction unless it be used in the dark.

I have entered into these details because the imprudent and indiscriminate use of phosphorus is likely to lead to the most serious if not fatal consequences.

On the employment of Phosphoric Acid.

Phosphoric acid has also been the subject of many observations and experiments. Dr. Lentin read to the Royal Society of Göttingen, a memoir, *De acido phosphori cariei ossium domitore*, in which he observes that as phosphoric acid is the essential constituent of bone, existing in it as long as it is solid, and in the residuum, when it undergoes decomposition, it might be usefully employed in caries of the bones. For this purpose he applies compresses moistened with the acid diluted with eight parts of distilled water, over ulcers under which the bone was carious. He resumed this dressing twice a day, and when the ulcer ceased to be fetid he used injections of it, and covered the whole with a pledget steeped in myrrh and mastic. The effects of this treatment were, that the ulcers lost their bad odour, the ichorous sanies gradually changed into the character of good pus, and the exfoliation of the portions of carious bone was rendered easy.

[In the epidemic cholera some instances occurred in which phosphorus was employed with occasional success. These instances I cannot at present refer to in the Journals where they were published; but I remember perfectly to have seen such in several German periodicals, and one or two in our English Journals. Thus in the 10th Volume of the Medical Gazette, Mr. Barry states, that in one case of Asiatic cholera, he had practical evidence of the good result from a careful use of phosphorus. In the space of four hours he gave one grain of the medicine in divided doses of a quarter of a grain each. He does not, however, state that his patient recovered. He further on adds that, as its action is principally exerted on the urinary organs, and in renewing in an extraordinary degree impaired nervous power, it would be well that it should have a regulated and steady trial. The method of preparing it by Mr. Barry is, to shake a piece of phosphorus in a phial of warm water, by which it is, like oil, separated into minute globules, which, on the addition of cold water, become solid: these globules are then to be reduced to powder with white sugar. Treacle will be a convenient vehicle for its exhibition. The withdrawal from air and light recommended by M. Magendie, is, however, absolutely necessary, in whatever form it may be kept or administered.—*Tr.*]

BI-CARBONATES OF SODA AND POTASS.

There is no doubt that the gastric fluid poured from the surface of the stomach during digestion, is of an acid nature. The experiments of Prout, Childers, Prevost and Leroyer, Tiedemann and Gmelin, go to prove that this acidity is owing to the presence of hydrochloric acid. Moreover, Prevost and Leroyer, Tiedemann and Gmelin, Leuret and Lassaigne ascertained that the presence of soda in the other fluids, that as-