

ble to which they belong. Besides, there are many substitutes in case of failure with ipecacuanha powder, as tartar emetic, sulphate of copper, &c. &c. The emetic lozenges of emetine may, however, be valuable where it is desired to produce vomiting in children, without trouble to the attendants or disgust to the child.—*Tr.*]

FEBRIFUGE ALKALIS.

Some years ago, MM. Laubert, Rheuss of Moscow, and Gomez of Lisbon published very interesting works on the cinchonas; but they were not agreed as to the principle in which the febrifuge virtue resided. MM. Pelletier and Caventou, led by former researches to believe in the existence of such a principle, and, conducting their inquiries on the plan which had led to the discovery of strychnia, emetine, &c. obtained a substance which they recognised as identical with the *cinchonia* already described by M. Gomez, and which they ascertained to be alkaline, a fact which had escaped previous notice. It was from the grey bark, (*cinchona condaminea*,) that they obtained the cinchonia. The yellow bark (*cinchona cordifolia*) afforded an alkali which, though similar to the cinchonia in many properties, differed too widely in others to be confounded with it; they therefore called it *quinia*. The red bark (*cinchona oblongifolia*) was next made the subject of analysis, and it became an interesting question whether this species, considered by many as the strongest febrifuge of all, contained cinchonia, quinia, or some third variety of alkali. The result was unexpected; the red bark afforded *cinchonia* precisely similar to that of the grey, but in three times the quantity, and *quinia* in nearly double the proportion found in the yellow bark. This quinia, with the exception of its somewhat greater fusibility, and a slight difference in the appearance of the sulphate, presented the same

characters as the other. Further experiments made on a large scale have shown that quinia and cinchonia exist in all these three species of cinchona; but that in the grey the cinchonia is in much larger proportion to the quinia, while the reverse obtains in the yellow, where the quinia predominates so greatly that it is not surprising the other principle should be overlooked in operating on small quantities. Dr. Michaelis, (Journal der Practischen Heilkunde, April, 1824,) of Magdebourg, has analyzed many species of cinchona, and determined, as follows, the proportions of cinchonia and quinia in a pound of each.

	Cinchonia.	Quinia.	Total.
China rubra	32 grains	64	96
China loxa	18	8	26
China fusca	,,	75	75
China fusca Huanuco	50	32	82
China fusca superf. Huanuco.....	74	28	102
China fusca superf. Huamalies.....	,,	12	12
China fusca Huamalies	48	28	76
China fusca Huamalies infer.....	60	34	94
China fusca Tenn superf.	12	44	56
China fusca Tenn médiocre	12	80	92
China flava Carthagena	28	48	76
China regia (rolled).....	,,	154	154
China regia (in flat pieces)	,,	286	286

Preparation of Cinchonia and Quinia.

The cinchona is deprived of its bitterness by means of boiling alcohol, and the tincture distilled to dryness in a water-bath. The alcoholic extract is entirely dissolved in boiling water, strongly impregnated with hydrochloric acid. Calcined magnesia is then added in excess, to fix the red colouring matter, and to clarify the liquor, the latter being affected by some minutes' boiling. It is allowed to cool, filtered, and the magnesian precipitate washed with cold water. The precipitate having been dried on a stove, is repeatedly treated with boiling alcohol, in order to remove all bitterness. The alcoholic liquors are now mixed, and the cinchonia crystallizes on cooling. The cinchonia thus obtained is still impure, from the presence of the

green fatty matter, which may be got rid of by solution in a highly diluted acid; if the acid were too concentrated, it would dissolve a portion of the fatty matter, and the end would be frustrated.

Quinia is obtained from the yellow bark by the same process as cinchonia from the grey.

We have stated that the cinchonia and the quinia are found in all the three species of cinchona. In the following manner they may be obtained by one and the same process.

After having procured the sulphate of quinia by a process hereafter to be detailed, we mix the mother-waters with those derived from washing during that operation. These waters retain the sulphate of quinia, rendered uncrystallizable by the presence of yellow matter and a portion of the fatty matter. The waters are to be decomposed by magnesia, or it may be done by means of lime. The magnesian precipitate having been washed and well dried, is treated with boiling alcohol, which dissolves the quinia and cinchonia. But here the cinchonia crystallizes, if the liquor be sufficiently charged with it; if it be not, it must be a little concentrated, and the cinchonia thus obtained should be purified by crystallization, in order to which, it is to be dissolved in a sufficient quantity of boiling alcohol; it will thus be obtained in a very pure state. The residual alcoholic fluids contain quinia, which is obtained by evaporation.

In a work lately published by MM. Henry and Plisson, these chemists have given a process for obtaining directly the quimates of quinia and cinchonia; they have also rendered it very probable that, in the cinchona, a part of the febrifuge alkalis is combined with the red colouring matter of Rheuss. The following is the process by which MM. Henry and Plisson have obtained the quimates. They treat with cold water the product of the aqueous decoction of yellow or grey cinchona reduced to the consistence of a syrup. The clear liquor decolorized and saturated with hydrate of lead, is filtered and then deprived of

the metallic oxide by means of a stream of hydro-sulphuric acid gas. The liquor being again filtered, is saturated with chalk, and evaporated to the consistence of a syrup; it is then repeatedly treated with alcohol, and the alcoholic liquors left to evaporate spontaneously. The quimates of the febrifuge alkalis crystallize very visibly in an irregular form, but not till after a considerable time. The compound of the red matter of Rheuss, and the febrifuge alkalis is nearly insoluble in water; soluble with the aid of heat in weak acids, without being sensibly decomposed, and precipitated on cooling in the form of a reddish powder. It is readily soluble in alcohol, and on the addition of water is deposited in red, orange-coloured, or bluish flakes. The alkalis decompose this compound by uniting with the colouring matter, and setting free the alkaloid. MM. Henry and Plisson propose to employ in medicine the quimates of quinia and cinchonia made very pure by the direct process.

Chemical Properties of Cinchonia.

Cinchonia is white, translucent, crystallizable in an acicular form, and soluble only in 700 parts of cold water; hence it has little taste. When dissolved in alcohol, and still more in an acid, its taste is strongly bitter and exactly like that of the grey bark. Cinchonia is very sparingly soluble in the fixed and volatile oils, and in sulphuric ether; it unites with the acids, and forms salts which are more or less soluble, and some of which easily crystallize; it is volatilized at a certain temperature, and the greater part is destroyed by this operation; still a sensible portion resists the decomposing agency of heat.

The sulphate and acetate are employed in medicine; the former is very soluble in water, the latter much less so, but is made easily to dissolve by an excess of acid.

The acetate is in the form of a granular powder, and does not crystallize — differing in this respect from

the acetate of quinia, which forms beautiful silky crystals.

Chemical Properties of Quinia.

It is white. It did not appear to be crystallizable by solution, but MM. Dumas and Pelletier made it assume a crystalline texture, by subjecting it to igneous fusion in vacuo, and allowing it to cool slowly. When thus treated it loses its resinous appearance and transparency, contracts, becomes opake, and forms centres of crystallization on its surface which radiate in all directions, and produce a clouded or wavy appearance. M. Pelletier has since obtained quinia crystallized in fine silky flocculi by submitting to spontaneous evaporation an alcoholic solution of very pure quinia. (Journal de Pharm. June 1825.) Though less soluble in water than cinchonia, its taste is much more bitter. Its salts also are in general more bitter; they are distinguished by their pearly and silky appearance. Quinia is very soluble in ether, while cinchonia is very little so, which affords a means of separating them when united. Quinia becomes electric when melted, and assumes the resinous electricity with much intensity, when rubbed with a piece of cloth.

MM. Dumas and Pelletier give the following as the medium composition of quinia.

Carbon	75.00
Azote	8.45
Hydrogen	6.66
Oxygen.....	10.40

A more recent analysis by M. Liebeg afforded,

Carbon	75.76
Hydrogen.....	7.52
Azote	8.11
Oxygen	8.61

Whence the formula C. 20, H. 24, A. 2, O. 2, which gives 2055.538, for the atomic weight of quinia.

M. Liebeg has estimated the equivalent of this alkali

by the proportion of hydrochloric gas, which it saturates; he found that 100 parts of quinia saturated 24.1 of hydrochloric gas, which gives the number of 1900 as the equivalent of quinia. Another experiment of the same chemist on a basic sulphate afforded the number of 4.300, which, divided by two, gives 1150, nearly equal to that afforded by the elementary analysis. These different results show that M. Liebig's analysis approximates very nearly to the truth.

Some years back MM. Dumas and Pelletier performed the analysis of cinchonia, which afforded

Carbon	76.97
Azote	9.02
Hydrogen	6.22
Oxygen.....	7.97

Mr. Brande (*Annals of Philosophy*, April 1824,) obtained a very different result.

Carbon	79.30
Azote	38.72
Hy drogen.....	7.17
	100.19

M. Liebig has given the following as the composition of cinchonia:

Carbon	77.81
Azote	8.87
Hydrogen	7.37
Oxygen.....	5.93

The atom, as determined by the capacity of absorbing hydrochloric gas is equal to 1005.1, which number is nearly equal to that afforded by the formula $C. 20, H. 22, N. 2, O. 2 = 1942.051$; the formula is derived from the numbers representing in total the composition of cinchonia.

Preparation of the Sulphate of Quinia.

M. Henry has published an expeditious and cheap

process for obtaining directly the sulphate of quinia. He treats the bark three times with hot water, acidulated with sulphuric acid, (50 grammes to a kilogramme of the bark,) filters through linen of close texture, decolorises the liquor with slaked lime, and washes the precipitate to separate the excess of lime. It is then dried, finely pulverized, and several times digested in alcohol at 36° . The alcoholic tinctures are collected in an alembic, which is placed in a water-bath. The spirit amounting to 1-9th of the whole is distilled off, and will serve for future operations; the residue is a brown viscous bitter matter, composed chiefly of impure quinia. This mass is treated to saturation with warm water, impregnated with sulphuric acid; the liquor is then filtered through paper, and on cooling affords crystals of sulphate of quinia, which are rendered perfectly pure by a second solution and crystallization. By a similar process the sulphate of cinchonia has been as successfully obtained from the grey bark. The sulphate of quinia thus obtained is in the form of white crystals little soluble in cold, but more so in boiling water, especially when a little acidulated.

The sulphate of quinia has the remarkable property of becoming luminous at a temperature of 100° , especially if slightly rubbed; this fact was first observed by M. Calloud, of Annecy. MM. Dumas and Pelletier subjected two or three ounces of sulphate of quinia contained in a glass bottle to a boiling temperature in a water-bath, for half-an-hour; it then gave out by friction a moderately intense white light. These gentlemen, by passing through the cork of the bottle a metallic rod terminated by a point at the interior extremity and a ball at the other, making the ball approach the knob of Volta's electroscope, and shaking the bottle previous to each contact, obtained the utmost repulsion among the straws of the electroscope; the electricity was constantly of the vitreous kind. The sulphate of cinchonia has the same phosphorescent and electric properties, but in an inferior degree.

MM. Pelletier and Caventou having established the fact that pure water does not extract all the quinia and cinchonia from the bark, M. Guerette of Toulouse, and several other chemists, made some new experiments and found that the barks which in the hospitals were rejected as useless after the aqueous decoction, might still be made to afford nearly 2-3rds of the alkaloids which they contained in the virgin state; the residue of the cinchona, after decoction should therefore be preserved for further use.

According to MM. Henry and Plisson, what remains in the bark after decoction is a sparingly soluble combination of quinia and cinchonia, with red cinchonic matter.

Preparation of the Supersulphate of Quinia.

M. Robiquet, by a somewhat different process, has obtained a sulphate whose characters are not the same with those we have described. It is in solid transparent prisms of a flattened quadrangular form, distinctly terminated, and soluble even in cold water. On a comparative examination of the two sulphates, M. Robiquet found that the solution of the prismatic salt was acid, while that of the other was alkaline. He was convinced of the stability of these characters from the salts retaining them unaltered, after repeated crystallizations; the subsulphate, however, lost each time a small portion of its acid. M. Robiquet ascertained, moreover, that his always obtaining the supersulphate was owing to the circumstance that the quinia could only be dissolved in water by means of a slight excess of acid, while if alcohol be used (in which the quinia is soluble) no more acid need be added than is requisite for saturation.

Comparative Analysis of the two Sulphates of Quinia.

M. Robiquet has made an analysis of these two sulphates, and having observed that the subsulphate lost

a portion of its acid by each crystallization, has given the composition of this salt after the first and third crystallization.

100 sulph. quinia	{ Acid 63.5 } 82.6
	{ Quinia 19.1 }
100 subsulph. 1st crystallization	{ Acid 11.3 } 90.73
	{ Quinia 79.0 }
100 subsulph. 3d crystallization	{ Acid 10.0 }
	{ Quinia 80.9 } 90.9

At the same time it is probable that M. Robiquet did not obtain this subsulphate very pure, since, according to the experiments of MM. Pelletier and Caventou, and those more recently made by M. Baup, what he calls the subsulphate of quinia is uniform in its proportions in the hydrated state. M. Baup regards the common sulphate of quinia, as a neutral salt, and thinks with justice, that this salt *effloresced*, is the best for medical use; as being invariable in its composition. If the neutral sulphate be kept in a moist place it can contain only 76 in 100 of quinia; but if it be kept in a dry place, and in an ill-stopped bottle, it may contain as much as 86. According to M. Baup, the supersulphate, when dry, contains

Acid .. 18.181	} 100 supersulphate.
Base .. 81.819	
Acid .. 10.000	} 100 neutral sulphate.
Base .. 90.000	
Acid .. 9.57	} 100 neutral sulph. effloresced and invariable.
Base .. 86.12	
Water . 4.31	

To obtain this effloresced sulphate, the common sulphate is to be exposed freely to the air, at a temperature of 20°. In four-and-twenty hours the salt will have entirely effloresced, and undergoes no change from further exposure.

Acetate of Quinia

Is remarkable for the great facility with which it crystallizes in silky needles; it is little soluble in the

cold, even with the addition of an excess of acid; on cooling it forms an amorphous mass.

Citrate of Quinia.

This has lately been prepared by M. Caventou. Citric acid easily dissolves quinia with the aid of heat; the solution is transparent, but becomes solid on cooling. Of all the salts of quinia this perhaps is the one which most resembles the sulphate in form. It may exist in the state of a supercitrate, and may be usefully employed in medicine where the object is to unite a tonic with an antiseptic effect.

The following is a good antiseptic syrup of the supercitrate of quinia:—

Simple syrup 1 pound.
Supercit. of quinia 36 grains.

The dose is from five and a half to eleven drachms in twenty-four hours.

Quinate of Quinia.

It is sufficient to state the composition of this salt, which is 0.82 of quinia and 0.08 of chinic acid.

Quinate of Cinchonia

Is composed of 0.59 cinchonia, and 0.41 chinic acid.

Both are prepared by decomposing a solution of sulphate of quinia or cinchonia in alcohol of 34° or 35°, by means of quinate of lime dissolved in a small quantity of water, separating the precipitate and evaporating the fluid until crystals form.

Preparation of the Quinates of Quinia and Cinchonia.

The best method of obtaining these two salts is by a double decomposition. For this purpose we take a solution of sulphate of quinia or cinchonia in alcohol at

34° or 35°, we add to it, in divided portions, quinate of lime dissolved in a small quantity of water till the precipitation ceases. The deposit is separated, and the evaporation of the liquid affords the salt of quinia, which may require to be dissolved in water and re-crystallized. The quinate of lime being necessary for the above process, we describe the method of procuring it, which is as follows:—

A kilogramme of yellow bark is boiled three times in water acidulated with sulphuric acid, (50 grammes to each quantity of water.) The liquors strained, and still hot, are decolorised by a sufficient quantity of hydrate of lead, and the whole is filtered. (The sediment treated with alcohol furnishes quinia.) We thus obtain a nearly colourless liquid, which is treated with sulphuretted hydrogen or with some drops of sulphuric acid. The liquor is then carefully decanted, and a slight excess of lime is added. The quinia and cinchonia of the quinates are precipitated and collected; the quinate of lime remains in solution and is obtained in crystals by evaporation. While it is still of the consistence of syrup it should be left some days exposed to the air; it thus concretes into a mass which, being purified by repeated solutions and crystallizations, yields the quinate of lime pure and very white.

Action of the Cinchonic Alkalis and their Salts on Animals.

Scarcely were the alkalis in question discovered, when M. Pelletier sent me a certain quantity that I might try their effects on animals. I soon perceived that neither the alkalis nor their salts were poisonous or even exerted any sudden effect that was appreciable; hence, it was evident that their effects might be safely tried on man.

Action on Man in Health or Disease.

From numerous experiments, I have come to the conclusion, that these two alkalis possess the medicinal

properties of the cinchonia, and consequently may be substituted for them in all cases. MM. Double, Villerme, Chomel, and many other physicians, have arrived at the same result from similar researches. If it be always of importance to the physician to know the exact quantity of the active ingredient in the medicine he employs, it is especially so with reference to the cinchonas, whose activity varies greatly according to the nature and quality of the barks. It is also of great advantage to be able to administer this medicine in a sufficiently small volume and in a form that is not disagreeable. Patients have perished in remittent fevers merely for want of resolution to swallow the necessary quantity of cinchona in powder, or from its exciting vomiting or diarrhoea; even in more favourable cases the stomach is obliged, as it were, to analyze the bark and extract its febrifuge principle; this, however, is a difficult and toilsome process even for the healthiest stomach, and chemistry has therefore rendered a real service to medicine by discovering a method of effecting this separation before hand.

The Académie Royale des Sciences has decreed to MM. Pelletier and Caventou a prize of 10,000 francs, for their important works on the cinchonas, and the sum of 2000 francs to M. Henry for his process, which has greatly diminished the price of the sulphate of quinia.

M. Caventou has informed us of the effects which he always experienced from the sulphate of quinia during his conjoint researches with M. Pelletier, when he had frequent occasion to taste liquids containing quinia or cinchonia. He perceived a general excitement similar to that he was always accustomed to experience from coffee. The analogy was so striking as to induce M. Pelletier and himself to analyze coffee, which is recommended by many physicians in the treatment of fever. They found in it neither quinia nor cinchonia, but a proximate principle crystallizable in long white silky filaments resembling amianthus, on which they did not extend their researches, as they

heard that M. Robiquet was occupied with the same subject, and already had in progress a work on this substance, which has been since called *cafeine*. This is not an alkaline base, but a proximate principle like narcotine; it does not saturate the acids, it merely dissolves them and crystallizes. The use of the sulphate of quinia is now general, and its efficacy in all affections of an intermittent type becomes more and more established. Accounts of intermittent fevers cured by this remedy have been published in all the academic collections and medical journals. Among other writers on this subject, we may mention Dr. Elliotson, who has published a very interesting paper in the *Medico-Chirurgical Transactions*,* on the use of the quinia and its sulphate. In intermittent fever he found the pure quinia as efficacious as the sulphate. He has also used this medicine with advantage in intermittent neuralgia and typhus. He gives the quinia and its sulphate in much larger doses than we do; he nevertheless assures us that his success has been constant. He gives the pure quinia in doses of five grains every six hours; he has even prescribed ten grains at the same intervals, without any bad effect.

Dr. Francis Baker,† senior physician to the Fever Hospital, at Dublin, has reported thirty cases of intermittent fever, of various types, which were all cured by the sulphate of quinia. He gave it in doses of from 1 to 3, or rarely 4 grains, three times a day: 6, 8, or 10 grains, often sufficed to prevent the return of the fever; in some cases, however, from 24 to 30, and in one 44 grains, were taken.

In the same collection is a paper by Dr. John O'Brien, containing an account of six cases of typhus, treated with the sulphate of quinia. From 3 to 4 grains were given per diem, and of the six patients, two were cured as rapidly as if the disease had been

* Vol. xii. part 2, 1824.

† Transactions of the Association of Fellows and Licentiates of the King and Queen's College of Physicians in Ireland, vol. iv. 1824.

intermittent fever; in three the success was as complete but less rapid; the sixth died. The reader will not be surprised to find sulphate of quinia administered in cases of typhus in England, when he learns that I myself saw Dr. Elliotson give it in large doses in erysipelas at St. Thomas's Hospital, without any bad effect.

M. Bally has also treated at La Pitié a great number of intermittent fevers with the sulphate of quinia, and always successfully. The efficacy of this medicine has also been proved in the treatment of remittent fevers. I have reported in my Journal* the first cases of this kind cured with the sulphate of quinia. The earliest instance was communicated to me by M. Renaudin, and a short time after I had myself an opportunity of administering the medicine beneficially,† and there is now no doubt either of the utility of this alkali, or of the superiority of the quinia and its salts over all other preparations of bark.

MM. Dupré,‡ Ribes,¶ and Piedagnel,§ have published in the same journal some interesting cases of neuralgia, cured by the sulphate of quinia; and the power of the remedy has been since confirmed by a number of similar observations. But it is not only in the above-mentioned diseases that the sulphate of quinia has been found useful. Dr. Klokow|| has succeeded in curing with sulphate of quinia, a severe and dangerous hemorrhoidal flux in a woman, fifty years of age. He gave 4 grains at a time, and after the second dose the hemorrhage was arrested; the mineral acids, alum, ipecacuanha, and opium, had been previously employed without success.

Dr. Goupil cured a man, twenty-eight years of age, of a severe affection of the chest, with hemoptysis of

* Journal de Phys. Expériment. Juillet, 1821.

† Idem, Octobre, 1821.

‡ Journal de Phys. Expériment, Avril, 1822.

¶ Id. Octobre, 1822

§ Id. Avril, 1822.

|| Journal der Practischen Heilkunde, Jun. 1824.

an intermittent type, by administering 18 grains of the sulphate of quinia in twenty-four hours, after having applied fifteen leeches to the anus two days before.* M. L. Martinet† has also published a memoir on the use of the sulphate of quinia, in large doses, in the intermittent fevers of Italy. According to his observations, it required to be given in doses of 20 and 24 grains, in order to arrest the quotidians and quartans; doses of from 12 to 18 grains were found insufficient. It produced no bad effect on the abdominal viscera, and the patients recovered. M. Chomel has given, with success, 36 grains of the sulphate at a single dose. In Italy, Professor Mathæis‡ has treated with the sulphate of quinia thirty-one cases of tertian fever, simple or double, and effected their cure; but he was obliged to carry the dose from 15 to 35 grains, in two or three days. This physician also relates two instances of remittent, one of which was cured by the cinchona and the other by the sulphate of quinia. M. Rossi has treated with sulphate of quinia sixty-four patients, affected with intermittent fevers of various species and types; eight tertians, twenty-nine double tertians, two quartans, twenty-seven sub-continued, and eight remittent fevers, were cured. Fifty patients had no paroxysm after the first dose, or had only slight ones. The quantity of the sulphate given varied from 12 to 62 grains, but in twenty-four cases it did not exceed 24 grains. M. Torelli has also reported sixty-five cases which were cured, with the exception of one, in which the sulphate was not administered till the patient was in a hopeless state. Of these cases four were quotidian, twenty-two tertian, thirty-one double tertian, three quartan, two double quartan, two sub-continued, and one remittent fever. Forty-two patients had no paroxysm after the first dose. The quantity given to each individual varied from 12 to 18 grains.

* *Nouv. Bib. Méd.*, Juillet, 1824.

† *Revue Médicale*, Mars, 1824.

‡ *Giornale Arcadico di Roma*, Novemb. 1822.

Manner of employing the Cinchonic Alkalis.

The preparations hitherto most in use have been the sulphates of quinia and cinchonia. Of the former, from 1 to 10 grains is given in twenty-four hours; where this dose has been much exceeded the success has not answered expectation, and unpleasant consequences have occasionally ensued, such as great agitation and very strong cerebral excitement. I have never found it necessary in any case to give more than 10 grains in the twenty-four hours, and have never seen this salt fail in its effect. In the hospitals with which I have for some years been connected I have made experiments to determine the exact dose at which the sulphate of quinia ceases to be a powerful febrifuge. I have found that 2 grains in twenty-four hours are sufficient effectually to cut short a tertian, quartan, or quotidian fever. Several physicians have informed me that their success was not equal to mine, and desired to know the reason, which I should suppose resided in the sulphate employed by them being adulterated, which is frequently the case, and also perhaps in the fact of their patients remaining in the localities where they contracted the disease, whereas mine were transferred to an hospital in a healthy situation, which is alone sufficient in some cases to arrest the paroxysms. M. Alphonse Ménard,* of Lunel, who appears to have had frequent opportunities of treating remittent and intermittent fevers, has published a memoir on the evils arising from large doses of the sulphate of quinia in the treatment of these diseases; and he assures us that he has generally found six grains sufficient to stop the progress of the malady. The observations of this physician, however, on the bad effects he attributes to the sulphate of quinia are not very conclusive, as other natural or accidental causes appear to have influenced the course of the disease. A very good thesis on the preparation of the cinchonic alkalis has been published by Dr. Ernest; it is entitled "De Medicamentis in

* Revue Médicale, Nov. 1825.

febribus intermittibus cortici Peruviano substitutis
D. T. M. Auctor. Frid. Adam Ernest, Saxo-Boruss,
1822.

Preparations of Quinia.

M. Pelletier has prepared, according to my formula, a perfectly colourless and transparent syrup of quinia. It contains two grains of quinia in the ounce. I daily obtain from it the most satisfactory results; it appears to me to have a happy effect in the scrofulous affections of children.

Syrup of Quinia.

Simple syrup 2 livres.
Sulphate of quinia 64 grains.

Six tablespoonsful of this syrup are usually sufficient to arrest intermittent fevers. I have even seen a remittent yield to the same dose.

Wine of Quinia.

Good Madeira..... 1 litre.
Sulphate of quinia..... 12 grains.

This preparation may be made with Malaga, or even with vin ordinaire.

Tincture of Quinia.

Sulphate of quinia..... 6 grains.
Alcohol at 34°..... 1 ounce.

The sulphate of quinia is preferable to the pure alkali in this case, because a tincture made with the alkali, not saturated with an acid, gives a precipitate when mixed with water. Wine of quinia may be extemporaneously prepared by adding two ounces of this tincture to a pint of wine.

Preparations of Cinchonia.

Cinchonia has also been employed as a febrifuge and tonic, particularly by Dr. Chomel; it possesses these properties, however, in an inferior degree to quinia, and in some cases the febrifuge effect has entirely failed.

We observed, in a former edition of this work, that it was to be wished that physicians would make further observations on the virtues of this substance, which exists in almost all the cinchonas combined with quinia, and is found nearly isolated in that of Carthagenæ. Such observations have accordingly been instituted.

M. P. Marianini, of Mortara, in the Milanese, has published an interesting memoir on the use of cinchonia and its sulphate in intermittents. He considers the effect of this medicine to be as certain as that of the sulphate of quinia, over which it has the advantage of greater solubility in water and less bitterness. M. Marianini affirms that cinchonia, and even quinia, may be divested of its bitterness by repeated washing with alcohol, and that the presence of a free acid is necessary for the development of this sensation by rendering the substance soluble.

In the first part of his memoir this author reports thirty-seven cases of intermittent and remittent fever, cured by sulphate of cinchonia. The five first were simple quotidians, the sixth a quotidian remittent, the remainder tertians. Eight cases of remittent follow, which were treated with sulphate of cinchonia; and seven of simple quartan, which were cured by it. In the second part of his work, M. Marianini details the results which he obtained with pure cinchonia; he cites sixteen examples of simple tertian, eight of tertian remittent, and fifteen of quartan fever. He usually administers cinchonia or its sulphate in some ounces of peppermint water; the first dose is always the largest; he gives as much as 30 grains of cinchonia at three doses in the course of a day, and sometimes commences with 20 grains.

Syrup of Cinchonia.

Simple syrup.....	1 livre.
Sulphate of cinchonia.....	48 grains.

This syrup may be employed in the same doses, and under the same circumstances, as the syrup of quinia.

Wine of Cinchonia.

Madeira.....	1 litre.
Sulphate of cinchonia.....	24 grains.

This may also be made with vin ordinaire.

Tincture of Cinchonia.

Sulphate of cinchonia	12 grains.
Alcohol at 34°	1 ounce.

A wine of cinchonia may be prepared by adding two ounces of this tincture to a pint of Madeira.

OF THE EMPLOYMENT OF SULPHATE OF QUINIA IN COMBINATION WITH OTHER MEDICINES.

With Opium or Morphia.

Many celebrated physicians have recommended the combination of opium with bark in the treatment of obstinate intermittents. Störck, Hoffman, Rivière, Sydenham, and Lind, frequently employed it with success. Sarcome made use of it when irritability of the stomach occasioned the rejection of the cinchona. Although the discovery of the sulphate of quinia has