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Original and Selected Papers.

PHARMACY IN PORTUGAL.*

BY THOMAS GREENISH, F. C. S.

In every country that I have yet visited I have found in connection with its pharmacy something worth notice, either in the systematic course of education required of the pharmacist, or in the political laws which govern the practice of pharmacy; even the business character or otherwise of the establishments where pharmacy is conducted is sometimes very significant.

The pharmacopœia of a country affords a very fair criterion of its pharmacy; the 'Codigo Pharmaceutico Lusitano par Agostinho Albano da Silveira Pinto,' revised by Jose Pereira Reis, 1858, can scarcely be considered a pharmacopœia. It is a compilation, and was made legal by a decree of 14th February, 1861, in these words, "In consideration that the new edition is found expunged of many of the errors and defects which applied to the old one, now extinct; also, taking into consideration that a long space of time must elapse before the legal pharmacopœia which the faculty of medicine of the university in the terms of its statutes is preparing be published, and as a book to teach the practice of pharmacy cannot be dispensed with in that interval, in agreement with the opinion of the faculty of medicine of the said university, do I hereby decree that the new edition of the 'Codigo Lusitano' shall be used provisionally as a legal pharmacopœia until the pharmacopœia now in charge of the university be printed and approved of."

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, Nov. 3, 1875, and published in the Pharm. Jour. and Trans.

The Codex is written in Portuguese, and in the formulæ there is nothing original or peculiar to the country; it seems a collection of many of those formulæ which have a claim to value in their respective countries. France is largely represented; the London Pharmacopœia has also been drawn upon, and, so careful, apparently, was the compiler, that no good formula should be omitted which could aid Portuguese therapeutics, one is inserted for Morrison's pills.

The Portuguese are not a medicine loving people; they are very abstemious, and probably the climate may be conducive to health. In a country that has so intimate a connection and such frequent communication with Brazil, Rio Janeiro, Pernambuco, and other parts of South America, I expected to find some drugs the virtues of which may not have reached England, but in conversation on this subject with medical men on the spot, I could not hear of anything worth notice; even jaborandi finds little favour in Portugal. Pharmacists appear to obtain their pupils from a lower class of society, as a rule, than in England, and they are usually apprenticed at an earlier age. There is no test of education prior to apprenticeship, but during its term the pupil has to read up and pass an examination in Portuguese, French, arithmetic and geometry. Latin forms no part of the necessary curriculum of his education. When his term of apprenticeship has expired he goes to one of the chief cities, either Lisbon or Oporto, and there gives his services to a pharmacist in return for food and lodging, with the privilege of being allowed to attend lectures on botany, chemistry, and pharmacy, at the Polytechnic School, and here he passes an examination in each subject. He must then work two hours a day for a period of two years in the laboratory of the Medical Chirurgical College either in Oporto or Lisbon. This also is usually done while still holding a situation on the same terms as previously stated. The final examination is conducted by two medical men and a chemist. Apprenticeship with this curriculum of study requires eight years to complete it, so as to qualify for the commencement of business on his own account. There is at present no school where the lectures specially suited for pharmacists are delivered; it is, however, proposed to adapt the Medical Chirurgical College in Oporto to supply the want of a class of assistant surgeons, and also pharmacists, and if this takes place, an opportunity will be afforded of obtaining the whole course of education in one establishment.

Since 1854 the regulations with regard to the examination of pharmacists have been made more stringent, and those who were in business before that time came in under modified regulations, and are now considered pharmacists of a second class. Prescriptions are written in the Portuguese language. Latin for that purpose is not permitted.

The pharmacy of Portugal seems to be superseded by foreign

"nostrums" largely imported from France, and also from America; England too is fairly represented. If a medical man wishes to prescribe strychnia he orders some foreign preparation of it, and even the preparations of iron are from some foreign source. Cod liver oil is of foreign manufacture, and being kept an unlimited time in the pharmacy it requires strong faith in its virtues to take it, and a stronger stomach in order to retain it.

In Oporto the British Hospital supported by English subscribers, for the relief of the crews of British ships exclusively, has a dispensary supplied with English drugs and all the appliances usually found in a chemist's shop. Here most of the prescriptions of English families are made up by the resident dispenser, and at a very moderate price. There is a very curious anomaly in the pharmacy laws of Portugal. A tariff of price is established, corresponding to the Arznei Taxe of Germany, and yet there does not exist the corresponding advantage which obtains on the continent of a limitation of pharmacies, and the consequence is, that whilst throughout Germany the average is one pharmacy to 10,000 inhabitants, in Lisbon and Oporto it is one to about 2,000 inhabitants.

When the necessity for a new pharmacopœia becomes apparent, the faculty of medicine of the University of Coimbra suggests its necessity to the Council of Superior Instruction in Lisbon, and this council addresses the Minister of the Interior, who orders a new pharmacopœia to be prepared, and refers it to the faculty of medicine at Coimbra. The pharmacopœia committee is composed of three medical men, one professor of chemistry, a botanist, and a pharmacist. A new edition is now in course of preparation and its issue is shortly expected.

At present pharmacy in the chief cities of Portugal is not in a satisfactory condition. In the provinces it is much worse, and we must look forward to greater facilities for a sound and systematic technical education on the part of the pupils, and to a more modern pharmacopœia, somewhat abreast of the present condition of the art of pharmacy and chemical science in more favoured countries.

SOLUBILITIES OF ALKALOIDS IN CRYSTALLINE AMORPHOUS AND NASCENT CONDITIONS.*

BY ALFRED B. PRESCOTT.

The few determinations here reported were made with the desire to obtain further data as to the power of solvents when used to

*Read at a meeting of the American Association for the Advancement of Science, and published in the Druggists' Circular.

extract alkaloids from water solutions or moist residues. The separations of alkaloids, by treating their salts, in water solution or in moist residue, at once with alkali and with solvents, are already found of great service in proximate analysis, The use of ether after alkali, as proposed by Stas in 1851, with the previous ether washing of the acid material as proposed by Otto in 1856, also the use of chloroform instead of ether, as proposed by Rodgers and Girdwood in 1856, and the use of amylic alcohol in the way of Otto's modification, as proposed by Uslar and Erdman in 1861, have become familiar from their value in forensic analysis. More recently, Dragendorff has presented methods for the use of various solvents, particularly chloroform, amylic alcohol, benzole, and "petroleum ether," each being applied alternately in acid and alkaline aqueous solutions for various analytical purposes, especially the separation of alkaloids from plant constituents, and the systematic separation of alkaloids from each other.

In most of these operations the solvents are necessarily saturated with water; and ether, chloroform, and amylic alcohol, hold quantities of water sufficient to affect their solvent power to a considerable extent. At the same time these three solvents can readily be obtained free from ethylic alcohol, and the ether and chloroform free from acids, the impurities occurring in their commercial state, and largely varying their solvent power, simply by washing with water. In other words, we have in water-washed ether, chloroform, and amylic alcohol, cheap, convenient, and uniform grades of these solvents, nearly or quite free from all impurities except the water, which is unavoidably present in the analytical processes to be provided for.

It is desirable to know how much influence the amorphous condition and that of recent liberation from salt have upon the adhesive force of alkaloids for these water-washed solvents; so that we may understand the degree of supersaturation attained when dissolving in the nascent or amorphous condition.

The *washed ether* used was neutral to test paper, and of sp. gr. 0·7290, at 15° C. Before washing, it was acid and of sp gr. 0·7477, at 15° C.

The *washed chloroform* was neutral, and of sp. gr. 1·4953, at 15° C. In washing chloroform, the last agitation was made and the water drawn off at 0° C., by which means more perfect separation is effected. It was slightly turbid when below 16° C., but clear when above that temperature. If washed at 18° to 20° C., it would be turbid below 24° C.

The *washed amylic alcohol* was of sp. gr. 0·8316, at 15° C.

The *washed benzole* was of sp. gr. 0·8766, at 15° C., and boiled at 89° C.

The *morphia* was purified by digesting and washing with the solvents employed respectively. The *cinchonia* was washed for

some time on a filter with ammonia of sp. gr. 0·96; then dried and well washed with ether and dried again.

Except as otherwise stated the solvents were applied at their boiling points for five minutes, when they were turned upon the filter. To dissolve in the "nascent condition," a sulphuric acid solution was warmed in a large test-tube, mixed with the solvent, and the mixture warmed to the boiling point of the solvent, then made *slightly* alkaline with ammonia and shaken, and kept warm for five minutes, then turned upon the filter. The filtered solutions were received in a tarred specific gravity bottle; the bottle being stoppered as soon as possible, and the weight of bottle and contents taken. The solution was then turned into a thin tared beaker, the bottle well rinsed with portions of the solvent into the beaker, and the liquid evaporated on the water-bath, at a suitable temperature, and the weight of the residue taken. The weight of residue, deducted from off the solution, gives the weight of the solvent. From 5 to 10 grammes of the solvent were used. For solubilities of morphia, two or more trials were made for each determination, the mean being given. For solubilities of cinchonia, but one trial was made in each determination.

Morphia: number parts of water-washed solvent required for one part of alkaloid:

	Ether.	Chloroform.	Amylic Alcohol.	Benzole.
Crystallized	6,148	4,379	91	8,930
Amorphous	2,112	1,977	—	—
Nascent	1,062	861	91	1,997

Cinchonia: number parts of water-washed solvent required for one part:

	Ether.	Chloroform.	Amylic Alcohol.	Benzole.
Crystallized	719	828	—	—
Amorphous	563	—	40	531
Nascent	526	178	22	376

Crystallized morphia treated 15 minutes with washed chloroform at 25° C., required 9,770 parts of the solvent; treated with boiling chloroform and allowed to deposit for twelve hours and then filtered, held 6,209 parts of the solvent.*

Nearly all the solutions deposited alkaloid on standing a short time, though most of the filtrates remained clear for five or ten minutes.

When the acid solution of morphia was made alkaline with a large excess of potassa (a ready solvent of the alkaloid), it required 5,656 parts of chloroform instead of 861. The writer has from time to time observed that alkalies which re-dissolve the alkaloids,

* Wormley gives 6,550 as ratio of chloroform (not washed) to morphia in saturated solution. Hagar, an authority generally exact, gives morphia as soluble in about 90 parts of chloroform.

in so doing, measurably prevent extraction upon Stas' plan. Doubtless, the best results in these cases would follow the use of measured qualities of standard solutions of the acid employed to salify and the alkali employed to liberate the alkaloidal material.

The residues of morphia from ether, chloroform, and benzole were amorphous; from amylic alcohol crystalline. The residues of cinchonia from ether and from amylic alcohol were crystalline, from chloroform and from benzole amorphous.

Determinations of solubilities, when the ratio of solvent to solid is very large, must necessarily be approximate rather than precise, even when the stable, saturated solutions are determined. And when the instable, *supersaturated solutions* are undertaken, it is evident that variations must be greater. The time taken in filtration, for instance, and the atmospheric temperature during filtration must effect the results. The effect of temperature of the solvent, when applied to the alkaloid at moment of its liberation, the writer has not yet investigated.

THERAPEUTIC ACTION OF THE OLEUM ALEURITIS TRILOBÆ.*

Dr. Calixto Oxamendi gives the therapeutic history of a new agent which may be considered as a good substitute for castor-oil (*Anales de Medicina de la Habana*, 1874).

The "Aleuritis triloba" is a large tree of the euphorbiaceous family, which grows principally in India, and in all the intertropical countries. It is commonly designated in India under the name of the "Candle-nut-tree" or "Candle-berry."

The oil produced from the nuts of this tree is used for different industrial purposes. The natives of Ceylon call it "Kekune oil," and it is known in England under the names of "Nut oil" or Artist's oil."

Very little has been said about the therapeutic properties of this plant; nothing can be found on the subject in the works treating of materia medica. A little notice is, however, given in *Griffith's Medical Botany*. This author says: "The nuts of the aleuritis triloba are considered as aphrodisiac when used in small quantity and in a dry state; they have laxative properties when taken in large quantity and in a fresh state." In one of his *Annuairis de Thérapeutique*, M. Bouchardat says, that the oil of aleuritis triloba has purgative properties in a dose of thirty grammes. Ranato de Grosourdy expresses the same opinion in his work on medical botany, but he thinks the oil must be used in a dose of two ounces (sixty grammes) in order to move the bowels.

* From the London Medical Record.

Following the indications of Bouchardt and Grosourdy, Dr. Oxamendi has employed the oil of aleuritis triloba, and his results are not quite conformable with those arrived at by his predecessors. Having once given this medicine to a healthy negro woman, he obtained an effect much stronger than he expected. By subsequent experiments he arrived at the conclusion that this oil must be employed in much smaller doses, and that half an ounce is quite sufficient to move the bowels of an adult.

The oil of aleuritis may be used with advantage as a substitute for other aperients. It greatly resembles castor-oil in its effects no the bowels, and it is by no means disagreeable ; it has a pleasant taste of hazel-nuts. It acts quickly (about three hours after its administration) and very gently, without giving pain and griping.

What is the physiological action of this aperient? Dr. Oxamendi thinks the laxative effects are not only due to the disturbance produced in the bowels by the oil itself, but also to a special resin which irritates the intestinal mocus membrane.

The walnuts of the aleuritis triloba are so oleaginous that they yield nearly half their weight of oil. This valuable agent may be also used in emulsion. The dose of the oil is two drachms for a child or half an ounce for an adult. The following mixture is recommended by Dr. Oxamendi :—

℞. Olei nucis aleuritis trilobæ ..... ℥ ss.
Gummi arabici ..... ℥ iij.
Aq. communis ..... ℥ iij.
Sacchari albi ..... ℥ ss.

Good results have been obtained by making frictions of the following liniment over the abdomen in cases of rebellious constipation or abdominal pains :—

℞. Olei nucis aleuritis trilobæ ..... ℥ ss.
Tinct. cantharid., Ammon. carbon., aa ..... ℥ iij.
Fiat. Linimentum.

NOTE ON DILUTE PHOSPHORIC ACID.*

BY P. W. BEDFORD.

At a recent meeting of the American Pharmaceutical Association no less than three excellent papers on this subject were read, a synopsis of which appeared in the *Druggists' Circular* of last month.† One of the papers, that by Professor G. F. H. Markoe,

* From the Druggist's Circular.
† Can. Pharm. Journ.

gave a process for its manufacture direct from phosphorus, and it was stated as being safe, economical and expeditious. In his paper Prof. Markoe gave quite full details as to the mode of manipulation, and at the time arranged the apparatus on the table; he also drew it on a blackboard, so that it could not well be misunderstood. In the synopsis of the paper, as published in the *Druggists' Circular*, all the main points were given, the proportions of ingredients, arrangement of apparatus, and the direction to control the rapidity of the process by keeping the jar immersed partly in water, so that the funnels should not become heated.

As we learn that Dr. W. H. Pile, of Philadelphia, has met with an accident in attempting to use the process, and, as it has been stated to be dangerous, the writer has made inquiry as to the cause of the accident, and also has made some experiments with the process himself. In addition to this, a recent letter from Prof. Markoe gives some information, which is incorporated in this note.

Prof. Markoe's paper stated that the water, phosphorus, and nitric acid were to be put into a flask or jar, and then a small quantity of bromine or hydrobromic acid were to be added *by drops*, when the funnels were to be placed in position, and the jar surrounded by water (if necessary), to moderate the action.

In the accident alluded to, this form of apparatus was not used, and the bromine was added at once! The action was so rapid that an explosion took place, and Dr. Pile was injured.

In order that this may not happen to any of your readers I shall repeat the directions, which ensure *perfect safety* in making this preparation.

(Of course, in handling phosphorus, it is to be supposed that your readers know that it is always to be done *with caution*, to prevent its combustion.)

In the process given previously, the quantity of water used was comparatively small, but it is enough, if the phosphorus be kept under its surface. Experiments by Prof. Markoe and myself have proved that it can be made with perfect safety with the proportions originally given. In order, however, to prevent inexperienced manipulators from accident, it is proposed to increase the quantity of water used. The glass flask should have a wide neck, but a stone jar is to be preferred, and should be of *double* the capacity of all the materials added together.

Into the flask (or stone jar) put the following:

Water	12 troy ounces.
Phosphorus	2 " "
Nitric acid, sp. gr., 1.42	12 " "
Iodine	10 grains,
Bromine	40 to 60 grains.

The water and phosphorus are placed in the jar, then the

iodine, and afterwards the bromine *by drops*, when the reaction has ceased, add the nitric acid, adjust the funnels, place the apparatus in a stoneware dish, and surround the flask or jar with cold water to about the same level as the acid mixture, and allow it to stand for twenty-four hours, at the end of which time it may be gently heated to dissolve the remaining phosphorus, when the heat may be increased to expel the nitric acid, and continued until, on testing, no traces of nitric acid are found. It may then be diluted with distilled water until it has the specific gravity of 1·056.

With the above proportions, and by following the manipulation given, it is impossible that any accident should occur.

Further experiments have proved that the use of water as one of the ingredients in the formula may even be dispensed with, and yet no accident occur, if the addition of bromine be *by drops only*, and the vessel containing the mixture of nitric acid and phosphorus be such as will give free vent to the vapours which are formed on the addition of the bromine. The rapidity of action is moderated by the use of ice cold water in the outer vessel.

The vapours given off in this modification of the process are the result of the decomposition of the nitric acid, and their presence in the jar or flask prevents the combustion of the phosphorus.

Another result of the experiments have been to prove that the proportion of nitric acid is in excess, and wasteful, when conducted on a manufacturing process, as nearly double the amount of phosphorus can be dissolved by the quantity of nitric acid employed, at the expenditure of a little more bromine.

The result of these further experiments will be given at a future time, the object of this note being simply to correct the idea that the process is dangerous when it is properly conducted.

The unfortunate accident which befell Dr. Pile was due to the addition of about *one hundred drops* of bromine, *at one time* to the phosphorus and nitric acid in a *glass retort*. Under such circumstances the rapid action would necessarily cause combustion, and the neck of the retort not giving free access to the products of the combustion, an explosion was inevitable.

In order that such an accident may not occur, the writer has given full details, *which, if followed*, will entirely avert any risk or danger.

SELECTIONS FROM DANISH JOURNALS.*

BY HANS M. WILDER.

I. *Syrupus Arseniatis Ferrosus.* By H. P. Madsen.—Having seen a circular from Clermont, a French pharmacist, recommending

*From the American Journal of Pharmacy, December.

a syrup containing ferrous arseniate in solution, Madsen attempted its preparation.

If a solution of ferrous sulphate is added to one of sodic arseniate, a white precipitate of ferrous arseniate is formed, which soon, however, turns dirty gray, and is transformed into basic ferric arseniate; when dry, the colour is grayish-green.

Madsen found that a solution is easily effected if citric acid be added to the solution of sodic arseniate before adding ferrous sulphate. He proposes the following formula for the syrup, taking the solution of sodic arseniate of Phar. Danica as basis=(1 part of the solution in 500 parts of water equal to 0·36 arsenic acid).

℞ I. Solution. sod. arseniatis, . . . grm. 45·00
Acid citric., ... 0·05
Dissolve.

II. Ferri. protosulph., ... 0·09
Aquæ dest., ... 5·00
Dissolve.

Add II to I and afterwards,
Syrup. sacchari, ... 450·00
M.

10 grm. contain 1 mgrm. ferrous arseniate.—*Ny Pharm. Tid.*, 1875, p. 295.

II. *Phosphorized Cod Liver Oil.*—0·02 grm. phosphorus dissolve by heat in 30·0 grm. codliver oil.—*Ny Pharm. Tid.*, 1875, p. 298.

Test for Ammonia.—J. Moddermann *(Viertelj. f. pr. Ph.)* observed by dissolving sulphate of copper in sufficient distilled water, that when he added more water the previously limpid solution grew turbid, with a greenish hue, and that a precipitate of the same colour was thrown down. By examination he found the precipitate to be basic sulphate of copper, and the reason for this to be the presence of ammonia in the distilled water. Ammonia being present only in minute quantity, explains how the solution first is clear and only by excess of water gets turbid. Sulphate of copper is then a very sensitive test for ammonia.

(The same turbidity happens if neutral solution of chloride of iron is largely diluted with water.—*Ny Pharm. Tid.*, 1875, p. 326.)

III. *Hydrocyanic Acid.*—It has hitherto been thought impossible to detect this acid in the body after some days have elapsed. Sokoloff (Ber. d. russ. Ges.) has recently shown the possibility of detecting it after twenty-two days had passed (in dogs having taken 0.028 grm. hydrocyanic acid). He says that it will not be found in the first distillate of the contents of the stomach with diluted sulphuric acid, but it will be found in the second. This seems to show that hydrocyanic acid does not exist in the body as a single com-

pound, but as a double cyanide, which is not so easily decomposed by a diluted acid.—*Ny Pharm. Tid.*, 1875, p. 325.

Crystallized Nitrate of Zinc has been recommended as a caustic. It is treated similarly to sulphate of copper by melting it in its own water of crystallization.

A caustic paste is prepared from 100 parts nitrate of zinc, 50 parts of water and 50 flour; if this paste be wanted in the form of sticks, it is necessary to dry them by as little heat as possible, else they become very brittle.—*Ibid.*, p. 328.

Decoction of Cinchona Bark, with and without Acid.—Mr. Krog-Jenson has examined into the percentage of alkaloids contained therein, and found that the plain decoction contained 41-43 per cent., and the acidulated 73-75 per cent. The residue containing respectively 59-57 per cent., and 27-25 per cent. of the alkaloids. —*Arch. for Ph.*, 1873.

Chloroform.—H. P. Madsen confirms Rump's statement, that it requires a large quantity of water to separate the alcohol from chloroform. Ph. Danica requires chloroform to be shaken with an equal weight of water. Mr. M. did not obtain a higher sp. gr. than 1·457, but by using a fourfold quantity of water he obtained a chloroform of sp. gr. 1·490.—*Arch. for Ph.*, 1875, p. 281.

Sulphate of Quinia.—The Swedish Pharmacopœia requires, among other tests, that the aqueous solution must remain clear after addition of water of ammonia (Kerner's test*). Mr. B. Lindeman (Stockholm), having several times found that solutions of sulphate of quinia of undoubted purity did not mix clear until after several minutes, lays stress on the following points: 1. That the temperature of the water not exceed 60° F. 2. That the water of ammonia have the right sp. gr.; and 3. That the test tube be only turned up and down and not shaken violently.—*Arch. for Ph.*, 1875, p. 328.

THE PREPARATION OF IODIDE OF ARSENIC.*

BY JAMES F. BABCOCK.

There are, no doubt, quite a number of chemical products described in the list of preparations of the U. S. P., which, being better adapted to production by the large manufacturing chemists than by those who work on the scale of the pharmacopœia, might

*Kerner's test will be found, "Am. Jour. Ph." (1862), xxxiv., p. 417, and particularly 426.

†Abstract of a paper read before the Amer. Pharmaceutical Association, Boston, Sept. 10, 1875, and published in the Laboratory.

well be transferred to the list of the materia medica; or, having fallen into disuse, should be omitted altogether; and it is possible that Iodide of Arsenic belongs to one if not both of these classes. But all will agree that, where an article is in the list of preparations, the process described should be the *best* process known for the purpose; and the product which may be obtained by careful manipulation, as the result of the formula given, should correspond to the description of the substance, in the smaller type, which, in the pharmacopœia, follows the formula itself.

The process for the preparation of the Iodide of Arsenic as given in the U. S. Pharmacopœia, consists in heating together the so-called metallic arsenic with iodine, in the proportions of one part of the former to five of the latter, and after the combination has taken place, pouring the fused iodide upon a porcelain slab to cool.

The product is described as an orange-red, crystalline solid, wholly soluble in water.

The product obtained by this process, however, does not correspond to the description given; because, not only are the proportions such as will leave some metallic arsenic unacted on—that is to say, there is too little iodine or too much arsenic, according to the formula—but iodide of arsenic, even when pure, undergoes a slight decomposition when dissolved in water; a small quantity of a yellowish-white *insoluble* powder being produced, which is described in the books as an oxiodide of arsenic. Moreover, metallic arsenic is somewhat difficult to obtain in the market, and when procured is impure; so that the amount of iodide of arsenic produced from it is uncertain, while the product itself is either very dark coloured or brownish; fails to dissolve perfectly, independent of the decomposition above noted, and if used for the preparation of the solution of iodide of arsenic and mercury, produces an unreliable article. Indeed, Donovan's solution has fallen into disrepute with many physicians, because the amounts of arsenic, iodide and mercury which it contains are so variable.

The writer proposes a process which avoids the use of metallic arsenic, and produces an iodide of a much purer character and of a more definite composition.

It consists in the solution of arsenious acid in hydriodic acid and the subsequent evaporation of the solution to dryness.

Hydriodic acid for this purpose is readily prepared by passing sulphuretted hydrogen into water holding iodine in suspension.

A Troy ounce of iodine is placed in a small vessel, with eight or ten fluid ounces of water, and the washed gas passed into it, until it loses all color except that due to the precipitated sulphur.

$$H_2, S + I_2, = 2\ H\ I + S_2.$$

The solution is filtered and boiled until its odor of sulphuretted hydrogen has ceased. The acid is poured into an evaporating dish, and there is added one-fourth ounce of arsenious acid; the liquid is

heated until the arsenious acid is dissolved, filtered if necessary, and evaporated to dryness. The reaction takes place between 2 molecules of arsenious acid and 6 molecules of hydriodic acid.

$$2\ As_2,\ O_3, +6\ H\ I = 2\ A\ s\ I_3, +3\ H_2\ O.$$

The product is in orange-red crystalline scales of definite composition, and capable of combining with its full equivalent of iodide of mercury.

Donovan's solution, prepared with this product, is of uniform and definite composition, of a very pale yellow colour, and free from excess of iodine.

A NEW GENERAL ANTIDOTE FOR POISONS.

M. Jeannel gives the following formula for an antidote for a number of deadly poisons: Solution of sulphate of iron (D 145), 100; water, 800; calcined magnesia, 80; washed animal charcoal, 40. These ingredients are kept separate, the solution of sulphate of iron in one vessel, the magnesia and charcoal in another, with some water. When needed, the sulphate solution is poured into the last-mentioned receptacle, and violently agitated. The mixture should be administered promptly in dozes of 1·6 to 3·3 ounces. From experiments M. Jeannel finds that this antidote, employed in proper proportions, renders preparations of arsenic zinc, and digitaline completely insoluble. It does not render oxide of copper absolutely insoluble, however, and leaves in solution notable quantities of morphine and strychnin. It neither decomposes nor precipitates cyanide of mercury nor tartar emetic. It saturates free idodine entirely, and acts but partially upon solutions of alkaline hypochlorites. Four ounces of the antidote are found to neutralize the poisonous effect of 1·6 ounces of arsenite of soda. It retards the toxic action of sulphate of strychnin, affording sufficient delay to administer evacuants. One third of an ounce is efficacious against digitaline injected into the intestines. The formula, says M. Jeannel, is certainly preferable to the officinal hydrated peroxide of iron, which in course of time, and at a temperature of 59° Fah., undergoes molecular modifications which render it unreliable as an antidote for arsenical preparations. —*Scientific American.*

TESTS FOR COAL-TAR COLOURS.*

Reds.—The coal-tar reds most frequently met with in commerce are: fuchsine, saffranine, and red coralline. These may readily be distinguished by their action in presence of an acid. An aqueous solution of fuchsine turns yellow; a similar solution of saffranine a violet blue; a solution of coralline gives an orange-yellow precipitate.

Violets.—Three violet colouring matters are in common use: phenyl violet, iodine violet, and methyl violet. The two former are only partly soluble in alcohol; the third dissolves even in water. To test a violet colour we dissolve some of it in water, adding ammonia. If the solution is red, the colour is phenyl violet; if it be clear, it is iodine or methyl violet. To distinguish between the latter, dissolve a little in water and add ammonia. Iodine violet gives a colourless solution, but *clear;* methyl also a colourless solution, but *thick.*

Blues.—There are only two coal-tar blues in commerce: aniline blue and alkaline blue. Alkaline blue is always soluble in water; aniline blue undergoes a modification, but is only soluble in alcohol. Aniline blue always gives a blue solution; alkaline blue gives a colourless one, which turns blue on the addition of an acid.

Greens.—The principal greens in commerce are aldehyde green, iodide green, and picric green. To test a green colour, proceed as follows: Ascertain if it is soluble in water; if it is, it is iodide; if it is not, dissolve in alcohol and add a solution of cyanide of potassium. If the solution is colourless, it is aldehyde green; if it is brown, it is iodide green accompanied by picric acid.

Yellows.—The yellows most in use are picric acid and its compounds and naphthaline yellow. All are soluble in water. They may be tested thus: Dissolve some of the colour in water; add cyanide of potassium, and heat. If the liquor turns a red-brown, picric acid is present. If it merely assumes a brownish tinge, it is naphthaline yellow. In the first case, if we wish to ascertain whether the picric acid is present in a state of purity or as a salt, we add benzine, and heat. If the colouring matter dissolves in the benzine, it is picric acid; if it remains insoluble, it is a salt of the same.

Orange.—The orange colours most in use are yellow coralline, the salts of chrysaniline and chrysotoleudine, victoria orange, and a mixture of naphthaline yellow and fuchsine, known under the name of aniline orange. To test an orange colour, we proceed as follows: Pour some ammonia on it; if the red colour in it dissolves, it is either coralline or a compound of chrysaniline. To distinguish between them, place a small quantity in alcohol, and add zinc and dilute sulphuric acid. If the liquor is dissolved, the colour is coral-

* *Moniteur Indust. Belge*, in *The Laboratory*.

line; if it remains unchanged, it is a compound of chrysaniline. When the red colour is not dissolved by the ammonia, we dissolve the colour in water adding some acid. If the solution remains unaffected, it is a compound of chrysotoleudine; if a precipitate forms, it is victoria orange or a mixture. Take a small quantity of the solution and add cyanide of potassium. If, after heating, the liquor turns brown, it is victoria orange; if it undergoes but slight change, it is a mixture of naphthaline and fuchsine.

Browns.—The most important browns are aniline brown, chestnut, grenat, and two kinds of phenyle brown, one prepared with carbolic acid and the other with phenylenediamine. We begin by trying whether the colouring matter is soluble in water; when it is not, we add hydrochloric acid. If it colours yellow, it is grenat; if the hydrochloric acid produces no change, we add a small quantity of ammonia to the solution. If a precipitate forms, the colour is either aniline brown or phenyle brown prepared with phenlenediamine; if the ammonia has no effect, it is grenat, *i. e.*, is isopurpurate of potassium. Phenyle brown is distinguished from aniline brown by giving a precipitate with cyanide of potassium, whilst the latter undergoes no change when exposed to this reagent.

A DECEPTIVE BEVERAGE.*

It may perhaps startle many total abstainers to learn that one of their favourite beverages, ginger-beer, is really a fermented liquor, and contains alcohol in proportions varying from 2 to 4 or 5 per cent. Nevertheles, such, according to Dr. Bathurst Woodman, in the *Sanitary Record*, is the case. "I should be very sorry," writes that gentleman, "to diminish the sale of ginger-beer, which I regard as one of the best of our summer beverages, containing as it does, in almost all samples, either free citric or tartaric acid, or the almost equally beneficial bitartrate of potash. I have before me the receipts of several large makers, and take the first that comes to hand. It contains, besides ginger, tartaric and citric acids, 200 lbs. of sugar to 180 gallons of water. These ingredients are duly fermented, &c., and then bottled. Now, 200 lbs. of sugar (cane sugar) will produce in fermentation nearly 100 pints of alcohol; and, making all allowances for loss in yeast, by evaporation, in bottling, &c., it is quite plain that this liquor will contain about 4 per cent. of alcohol, and the result of actual experiment shows the same. The other receipts only differ slightly in the amount of the saccharine substance, as regards the water, or the kind of sugar present, or the acid employed. This percentage of alcohol is, of course, about half the strength of most of the malt liquors in common use by the middle classes of this country, but about equal to many of the cheaper ales, and to much of the beer drank in Germany and other parts of the Continent."

* Chemist and Druggist.

THE ANALYSIS OF CINCHONA BARK.*

BY EDWARD LAWRANCE CLEAVER, F. C. S.

Late Assistant Demonstrator in the Laboratory of the School of Pharmacy, Bloomsbury Square.

The want of a quick and accurate method for the estimation of the alkaloids in Cinchona Barks has long been felt, and although numerous processes have been suggested for the purpose, the author feels justified in saying that there has not been published up to the present moment any method by which a person inexperienced in bark analysis could obtain trustworthy results. A *résumé* of some of the existing processes, in order to point out their defects, will possibly be of some service.

The B. P. method is as follows :—

One hundred grains of finely powdered bark are macerated and boiled in 1 fluid oz. of acidulated water, then percolated with 1½ oz. more of similarly acidulated water, or until the percolate is free from colour. The liquor is then treated with subacetate of lead to remove colouring matter, etc., and after filtration, mixed with caustic potash and 12 fluid drachms of ether. The ethereal solution is removed, evaporated, and the resulting alkaloid weighed. The chief objections to this method are the following :—

(1) The quantity of bark directed to be taken is too small.

(2) One fluid ounce of liquid is not enough to properly macerate 100 grains of bark in fine powder.

(3) One and a-half ounces is not sufficient liquid to exhaust the bark, and if percolated until the percolate is free from colour, about 10 ozs. of liquid will have to be collected.

(4) The removal of the colouring matter by subacetate of lead ensures loss of alkaloid.

(5) The method of removing the alkaloid by means of ether ensures loss of alkaloid, and also does not guarantee the purity of the residue.

(6) Quinine is not perfectly dried by the heat of a water-bath.

The next method for consideration is that in which the bark is exhausted with dilute acid and precipitated with soda. The precipitate is then washed, treated with some solvent, such as oil of turpentine, coal oil, alcohol, or ether, the liquid filtered and distilled off, and the residue treated with dilute acid, precipitated, dried and weighed. The objections to this process are :—

(1) The quantity generally ordered (100 grains) is too small.

(2) Some barks when exhausted with acid and precipitated with

* Read at an Evening Meeting of the Pharmaceutical Society of Great Britain, November 3, 1875, and published in the Pharm. Journ. and Trans.

soda give a precipitate which does not subside easily, thus giving rise to loss.

(3) The precipitate so obtained is much contaminated with colouring matter, which dissolves in the menstruum used to exhaust it.

(4) The water used to wash the precipitate dissolves some of the alkaloids present.

Another process is that suggested by Dr. De Vrji, which is as follows:—

Twenty grams of bark are made into a paste with 5 grams of slaked lime and then dried, the resulting powder twice boiled with strong alcohol, and the liquids mixed. It is then acidulated with sulphuric acid, filtered, and the spirit distilled off. The resulting liquid is filtered, precipitated with soda, and the precipitate washed, dried and weighed.

This is certainly the best process hitherto described, as by it the alkaloids are obtained in a very pure condition, but it is open to the following objections:—

(1) The quantity ordered to be used is too small.

(2) In washing the alkaloids some of them are dissolved, and if much water be used the error this causes is considerable.

Bearing in mind these objections, I have endeavoured to devise a process which, even in the hands of inexperienced persons, shall give accurate results in a short time. It is as follows:—Not less than 100 grammes of finely powdered bark are made into a paste with 25 grammes of slaked lime, and dried over a water-bath. The dried mass is then thoroughly exhausted with spirit, which operation I perform as follows, but which can be varied at the will of the operator:—

I put the mixture into a percolator, which has the outlet closed by a tap, and is steam jacketed; on the top is clamped a movable cover having an upright condenser attached to it.

The tap at the bottom being closed, a litre of strong methylated spirit is introduced. Steam is then passed into the jacket, and the mixture well boiled for half an hour, the spirit that evaporates condensing and running back into the percolator. At the end of that time steam is turned off and the tap at the bottom opened, when the spirit will flow out. A little fresh spirit is poured upon the top of the mixture to displace that held in the mass, and the above operation is repeated.

The percolates are then united and made faintly acid with sulphuric acid, and the spirit distilled off, which is best done in a small flask, holding about one-fourth of a litre, with an arrangement fitted to secure a flow of spirit equivalent to the amount that distils over. When all the spirit has distilled away the remaining liquid is turned out and filtered into a beaker, the filter being washed and the liquid evaporated to dryness with excess of pure carbonate of

barium (which should be well washed before use in order to free it from carbonate of sodium, which would vitiate the results); it is then exhausted with alcohol, and the liquid made up to a measured volume. If only the mixed alkaloids are wanted, a portion of the liquid is evaporated to dryness and dried at 130°C. until dessication is complete. If, however, the proportions of quinine or other alkaloids are wanted, the operator must adopt one of the undermentioned methods, according to circumstances.

In estimating the amounts of the different alkaloids contained in the barks it must be remembered that quinine exists in two modifications, viz., amorphous and crystalline, and as the commercial value of a bark depends chiefly upon the amount of crystallizable quinine it contains, an alteration of the process is required accordingly as the analysis is made for commercial or experimental purposes.

I will first give some methods by which the total amount of alkaloids can be ascertained.

All the cinchona alkaloids with the exception of quinine are insoluble in pure ether when treated singly with that solvent; but in the presence of quinine cinchonidine is dissolved also, hence in barks containing both quinine and cinchonidine the proportions of quinine found are always too high. Great care must also be taken with regard to the ether used; none but pure, well washed and afterwards dried ether being taken, as the alkaloids other than quinine are perceptibly soluble in the water and alcohol which ordinary samples of ether always contain. The first method for the estimation of the total quinine is that in which the white powder, obtained in the preliminary operation of extracting the total alkaloids by saturating the acid solution with excess of carbonate of barium, is exhausted with ether, the ethereal solution evaporated, dried at 130°C:, and weighed. This method when carefully performed gives accurate results, providing cinchonidine is absent from the bark employed, otherwise the results are a little too high. Another method which may be resorted to when rapidity is an object, is as follows:—

The alcoholic solution of the mixed alkaloids obtained as described above is divided into three or or four equal parts, the first of which is evaporated to dryness, dried at 130°C., and weighed. This gives the total alkaloids. The second portion is evaporated to dryness, treated with ether, and the solution filtered, evaporated, dried at 130° C., and weighed. This gives the total quinine. The third portion is titrated with standard sulphuric acid, and by means of the following equations the proportions of the isomeric alkaloids are obtained :—

Let x=the amount of quinine and quinidine in the weight of alkaloid taken. The total weight taken—x=the amount of cinchonidine and cinchonine present, then

$$\frac{x98}{648} + \left\{\text{the total alkaloids} - x\right\}\frac{98}{616} = \left\{\text{The amount of sulphuric acid used.}\right.$$

The quinine found previously is then subtracted from the value of x, which gives the quinidine. That portion of No. 2 which was insoluble in ether is then treated with warm dilute sulphuric acid, and made faintly alkaline with solution of soda. Rochelle salt is then added, and the precipitate that forms after some time collected and weighed; it consists of tartrate of cinchonidine, and contains 80.4 per cent. of cinchonidine.

The cinchonidine found is then deducted from the weight of mixed cinchonine and cinchonidine found from the equation, and thus gives the amount of cinchonine.

The amount of alkaloids found are then multiplied by three or four, according to the number of parts into which the alcoholic solution was originally divided.

This process is comparatively rapid, and if carefully performed gives accurate results.

I next come to those processes in which the separation of amorphous and crystallizable quinine is required. Dr. De Vrji effects this separation by taking advantage of the fact that the amorphous alkaloid does not form herapathite with an alcoholic solution of iodine, and this method is exceedingly good, but it has the disadvantage of not producing the alkaloid in the state of crystalline sulphate which is the condition in which the quinine present is required by the manufacturer. A process for the estimation of the crystallizable quinine has been devised by Carles, who obtains the mixed sulphates in a hot, slightly acid solution. He then says that on cooling the whole of the quinine is precipitated, whilst the other alkaloids remain in solution. This, however, is an erroneous statement, as the other alkaloids are precipitated under similar circumstances with the quinine.

The process I have adopted is as follows :—

The powder obtained by saturating the acid solution of the total alkaloids with carbonate of barium is exhausted with pure ether; this solution is then evaporated to dryness, and the extract dissolved in dilute sulphuric acid; it is then heated to boiling and made faintly alkaline with solution of soda, and on cooling, the sulphate of quinine is deposited in fine white crystals which are collected, slightly washed, dried over a water-bath and weighed. The mother liquor and wash water is then collected and either evaporated down, and the fresh crop of crystals added to those already collected, or it is measured, and one part by weight of quinine sulphate added to that before found, for every 300 parts by volume of the liquid.

The points to be noted in this method are :—

The quantity of dilute acid used to dissolve the quinine should not be more than forty times the amount of the alkaloid present.

The hot solution must be quite clear after the addition of the soda, otherwise the crystals of sulphate obtained are mixed with uncombined alkaloid.

The sulphate should be dried over a water-bath, and not at a higher temperature, as I find that sulphate of quinine gains in weight from 100°C to 140°C, after that it fuses and loses weight till constant.

In conclusion, I must impress upon intending operators in cinchona analyses that the utmost attention be paid to detail when the analyses are undertaken for commercial purposes, as errors, which would not be of any importance in ordinary cases, may cause serious loss owing to the high value of the material concerning which the analysis is performed.

NOTE.—The reading of this paper elicited much unfavorable criticism, but during the discussion some valuable information was brought out, which we will reproduce in a future number.—ED. CAN. PHARM. JOUR.

ASSAY OF FIVE SAMPLES OF OPIUM, COMPARISON OF THREE MORPHIOMETRIC PROCESSES, AND EXAMINATION OF TWO SAMPLES OF "AMERICAN OPIUM*."

BY J. CLARK MOSS, P. C.

The five samples of *opium* were purchased at as many dispensing stores. The proportion of *morphia* was determined by Staples' process with Procter's modification,† the dry powdered opium being first exhausted with warm benzole, and the solution treated with ammonia in presence of alcohol, exactly as in the U.S.P. preparation, the crystals being washed with ether (without use of animal charcoal.) The opium was weighed in the condition purchased, and the per cent. of morphia calculated on that weight. The per cent. of *water* was ascertained by drying the powder, in a steam oven, to a constant weight. The samples were more or less air-dried when obtained.

	Water.	Morphia.
No. 1	9·84 p. c.	8·94 p. c.
" 2	5·80 "	7·56 "
" 3	7·26 "	10·92 "
" 4	9·77 "	12·53 "
" 5	— "	9·25 "
Average,.....	8·17 "	9·84 "

* From the American Journal of Pharmacy.

† "Proc. Am. Phar. Asso.," 1870; "Am. Jour. Phar.," 1871, 65.

No. 5 was assayed again by *Hager and Jacobsen's process*‡.

This process may be described as follows: Triturate 6½ grams of opium with three grams of dry calcium hydrate and enough water to form a soft mass, and rinse into a weighed flask, adding water enough to make the mixture weigh 74½ grams. Cork, digest on the water-bath for one hour, cool and replace water to restore the weight to 74½ grams. Filter 50 cub. cent. into a small test-tube previously marked to that measure; add to this filtrate 8 drops of benzole and 3 cub. cent. of ether; cork and shake, and then add 4½ grams of powdered ammonium chloride, and agitate till dissolved. After three or four hours, filter out all the crystals upon a weighed filter; dry and wash with a little chloroform (Hager prefers non-alcoholic ether); then dry and weigh as alkaloid from 5 grams opium. In this examination of No. 5,

Staples' process gave 9·25 p. c. morphia;
Hager-Jacobsen's process gave 9·89 p. c. morphia.

The *process recommended by Flückiger and Hanbury*§ was tried. This process differs from Staples' chiefly in the particulars that the opium powder, with pumace, is exhausted with boiling ether; the solution to be treated with ammonia is but very slightly alcoholic (and is slightly acid), and the crude crystals are purified by recrystallization from alcohol of sp. gr. 0·822 at least once. No. 1, by

Staples' process gave 8·94 p. c. morphia;
Flückiger and Hanbury's 10·34 p. c. crude morphia.

The morphia was not as pure in the latter as in the former process, and the repeated crystallizations caused continued diminutions in its quantity.

By the U. S. P. process, smaller percentages were obtained, as the loss by animal charcoal could not be wholly prevented. Schacht's process (1862) requires the decolorization of the opium infusion with animal charcoal, after which the filtrate is set aside with excess of ammonia, and the crystals well washed with ether for extraction and determination of narcotina. Dragendorff, in his recent valuable work,‖ states the loss by this use of animal charcoal to be about 1 per cent. He recommends its omission, substituting purification by washing the crude morphia with dilute alcohol, or else dissolving in acidulated water and precipitating by ammonia. (This precipitate will be crystalline and requires time.) Of the processes above named, the investigator at present prefers Hager-Jacobsen's, both because of its good results and because it is completed in a shorter time than the others.

‡ Hager's "Untersuchungen," ii., 176. Hoffmann's "Examination of Medicinal Chemicals," 268. A modification of this process is given from Schlosser in "Am. Jour. Pharm." 1871, 224.

§ "Pharmacographia," 59.

‖ "Werthbestimmung einiger starkwirkender Droguen," 82.

The first sample of "*American Opium*" was obtained at a dispensing pharmacy in Toledo, Ohio, with the assurance that it came from Southern Ohio, was two years old, was believed to be veritable opium, but was never dispensed in prescriptions. It is darker in color than genuine opium, with nearly the same consistence, and permeated with small crystals, just distinctly visible to the naked eye. It has an odor resembling both tobacco and licorice, but not resembling opium. It has no taste of opium. It was found to be destitute both of morphia and of narcotina. Water dissolved 89·4 per cent of it, the solution containing much gum and rapidly fermenting. The crystals were found to be potassium nitrate. A trace of alkaloid was indicated by a slight precipitate with potassio-mercuric iodide, but the examination was not extended to any further definite result.

The second sample was obtained at a pharmacy in Detroit, Mich., after fruitless inquiry for American opium at a large number of stores in that city. It was marked "Wilson's American Opium," and was stated to have cost $4 per lb., and that it was not used except for laudanum for external application! It closely resembled the other sample, having neither the appearance, taste or odor of opium, and not containing morphia or narcotina, at least in quantities distinguishable by ordinary means.

THE PHARMACY OF SALICYLIC ACID.*

BY M. MAURY.

The author, who is a pharmacien residing at Lyons, has made a compilation of different formulæ for the administration of salicylic acid, which he read before the Pharmaceutical Association of that city at its October meeting. The paper is published in the *Répertoire de Pharmacie* (Oct. 25, p. 609), and we are indebted to it for the following extracts:—

External Use.—Dr. Wagner recommends that a thin layer of finely powdered salicylic acid should be spread upon calico and applied by means of a bandage to wounds.

Pomade.—Dr. Wagner gives the following formula:—

Salicylic Acid	15 parts.
Alcohol	30 "
Lard	150 "

It is important to use the alcohol as a solvent, the direct mixture of the acid with the lard does not give the same good effects.

Dentifrices.—M. Paulcke, a pharmacien at Leipzig, prepares as

*Phar. Jour. and Trans.

a dentifrice a powder in which salicylic acid is incorporated; also an "*élixir dentifrice*," from a solution of the acid aromatized with oil of wintergreen.

Foot Powder.—It is stated that salicylic acid removes the odour of sweat from feet, without preventing the sweating, its action being to prevent the formation of butyric, valerianic and other acids of the same family, which injure the feet. M. Paulcke therefore prepared with salicylic acid, soap, talc, and starch, a powder for the feet, which whilst rendering them firm, is said to induce an agreeable softness and to remove all unpleasant smell.

Mixture.—The following formula is attributed to Professor Wunderlich :—

Salicylic Acid	1 gram.
Oil of Sweet Almonds	20 "
Gum Arabic	10 "
Syrup of Almonds	25 "
Orange Flower Water	45 "

A teaspoonful to be taken every hour when children are sufficiently old to use a gargle. Dr. Fontheim says it may be so administered every hour.

Solution in Glycerine and Water.—M. Muller, a pharmacist at Breslau, gives the following :—

Salicylic Acid	1 gram.
Glycerine	20 "
Distilled Water	80 "

First treat the acid with the glycerine, and then add the water.

In Switzerland, salicylic acid has been used in typhoid and paludian fevers, etc. It has been noticed that it has a very remarkable cumulative action; for after having obtained the desired remission by a first dose of 4 to 8 grams, it has been found that a dose of one half, or one fourth that quantity on the following days is sufficient to keep the temperature within good limits. Dr. De Cerenville recommends that these doses should be administered in water, flavoured with liquorice juice.

The following formulæ are due to M. Maury :—

Antiseptic Mouth Paste.—

Rectified Salicylic Acid	2 grams.
Honey	34 "

Compound Powder for Extemporaneous Antiseptic Mouth Paste.

Rectified Salicylic Acid	2 grams.
Powdered Sugar, or some other inert powder	20 "

Mix. To be applied to the sore parts of the mouth by means of a brush previously moistened with water.

Lozenges.—Salicylic acid, with sufficient gum and sugar for each lozenge to contain 25 milligrams of the acid.

Salicylic Syrup.—Pure salcylic acid, with sufficient syrup of orange-flowers for 20 grams to contain 5 centigrams of the acid.

Mixture.—

Pure Salicylic Acid.....	1·50 grams.
Powdered Gum Arabic.....	10·00 "
Sugar.....	10·00 "
Orange Flower Water.....	20·00 "
Distilled Water.....	100·00 "

F. s. a.—Shake the bottle before each dose. A teaspoonful every two hours for children.

Salicylic Wine.—

Pure Salicylic Acid	2 grams.
Muscat Wine.....	100 " F. s. a.

Wine of Cinchona and Salicylate of Quinine.—

Calisaya Bark	30 grams.
Salicylate of Quinine	1 "
Maderia Wine	1000 " F. s. a.

Injection.—A solution of 1 part of salicylic acid in 300 parts of water has been used as an injection in fluor albus.

POISONOUS MAGENTA COLORS.*

Dr. Springmuhl, the editor of the *Musterzeitung*, states that out of twenty-five specimens of magenta only one was found free from arsenic. In fourteen the amount was sufficient for quantitative determination. In four samples the proportions were respectively 6·5, 5·9, 5·9, and 5·1 per cent. Such qualities, of course, must prove dangerous if used for coloring liquors, confectionery, and toys. In dyeing, however, the amount of the poisonous matter which attaches itself to the wool is relatively trifling. This the author ascertained by an interesting experiment. In a beaker he dissolved 1·55 grains of the most poisonous sample in hot water. The solution, of course, contained 0·093 grains of arsenic. In it a square foot of pure wool (woolen tissue) was dyed. It was then well rinsed in a second beaker of pure water, and again in a third. The dyed wool, the residual dye, and the two wash waters therefore contained 0·093 grains of arsenic, and it remained to ascertain its distribution. In the dye bath were found 0·072 grains, in the first washing water 0·016. In the second washing water the amount was too small to be determined. It, however, and the dyed wool must together contain the residue, 0·005. According to Marsh's test, the wool appeared to contain less than the second washing water. Hence a square inch of the woolen could contain scarcely 0·0003 of a grain

*Scientific American.

of arsenic. If the proportion of arsenic is low, as in well purified magentas, the wool, when dyed, gives no indications by Marsh's process.

The two most frequent adulterants are oxalic acid and sugar. The author has found twenty-one per cent. of the former, and twenty-four per cent. of the latter. Joly has detected sugar to the extent of fifty per cent.

Aniline violets are more liable to sophistication than magentas, from the fact that they are sold not in well-defined crystals, but in powder or in cakes. The author has detected gum in a Hofmann's violet to the amount of twelve per cent., and eight per cent. of finely ground charcoal in a common phenyl violet.

Of thirty-two samples of iodine green examined, five were unquestionably sophisticated. One contained eighteen per cent. of sugar. An English sample was cleverly sophisticated with a salt of lead, probably the picrate, and deflagrated when a portion was heated upon platinum foil. Metallic lead was found to the extent of ten per cent., corresponding to twenty-one per cent. of the picrate. Two other samples contained respectively fourteen per cent. of common salt and twenty-six per cent. of magnesia. Oxide of chromium is also a possible adulteration.

The finest sample of iodine green examined was from the manufactory of H. Siegle, in Stuttgart. The author considers that in the production of this beautiful and costly color the Germans are superior to the English and the French.

THE PINE.*

Although some forests are regarded as sources of malaria, and oak trees and hazel bushes have been counted insalubrious in Europe, like the Tamarind trees in the East, yet the air of the pine forests always appears grateful to the lungs, and has been considered wholesome, although of its absolute curative influence there is little evidence, and indeed it must be difficult to procure such. The idea of pine forests exercising a balmy influence of on the lungs is a very ancient one. Pliny considered that the air of pine forests was more useful in phthisis, and in convalescence from acute diseases, than the voyage to Egypt recommended in such cases in those days. Both Bournemouth and Arcachon, at the present day, owe a good deal of their reputation to their pine woods. The air of the latter is said to be distinctly sedative. On the whole, then, the air of the pine woods of the Black Forest may be regarded as an element entering into the consideration of the value of its baths.

*Lancet.

But besides merely inhaling the air of its forests, people have of late years made use of the products of pine in baths, vapour baths, and inhalations. Even this is not entirely modern; for the ancients recommended chiefly the internal use of decoctions of strobili and pine tops, and thought pine nuts very useful in diseases of the chest; and at a more modern time, besides the internal use of drinks made from the spruce and tar water so long in vogue, we had inhalations of tar of various resins. The ancients, did, indeed, recommend in gout, baths of water in which cedar wood had been boiled, but the use of the pine extract bath is quite modern. It has spread rapidly, and is in use at Gleisweller, Rehburg, Liebenstein, Ruhla, and Eisenach. These aromatic extracts are procured from various pines—as from the *Abies excelsa*, or Norway spruce; silver fir, *Pinus sylvestris*, or Scotch fir; *Pinus maritima*, or Bordeaux pine; the Weymouth pine, also from the common larch, and the most fragrant of all from *Pinus pumilio*, the mountain pine. The baths vary considerably in strength and in odour, according to the way in which they are prepared. The commonest way of making the baths is by adding to common water a certain quantity of the decoction got by passing steam through the young pine tops.

DETERMINATION OF MIXED OILS.*

The testing of mixed oils is far from being a certain operation. The following, however, are the principal means of determining the presence of mixtures.

1st. The determination of its specific gravity at 15° C. and its comparison with the following table:—

	Density.	Degrees on alcoholometer.	Weight of 1 hectolitre.
Tallow oil (oleine)	900·3	73·0	88·40
Colza (winter strained)	915·0	59·8	91·50
" (summer ")	916·9	59·8	91·67
Rape-seed (winter strained)	915·4	59·5	91·54
" (summer ")	915·7	59·2	91·57
Groundnut (Arachis oil)	917·0	58·5	91·70
Olive	917·0	58·5	91·70
Almond	918·0	58·0	91·80
Beechnut	920·7	57·5	92·07
Sesame	923·5	56·0	92·35
Whale	924·0	55·0	92·40
Poppy	925·3	54·5	92·53
Hemp-seed	927·0	53·5	92·70
Cod-liver	927·0	53·5	92.70
Cotton-seed	930·6	52·0	93·06
Linseed	935·0	50·0	93·50

* Moniteur des Produits Chimiques in Journal of Applied Science.

2nd. Chlorine turns animal oils brown, and vegetable oils white. The former are soluble, and the latter insoluble in ether.

3rd. To discover an adulteration by oil of sesame, shake five grammes of sulphuric acid with five grammes of nitric, and ten grammes of the suspected oil; if mixed, a grass-green colour is immediately developed.

4th. To find if olive oil is mixed with any unknown oil, mix fifty centimetres of the oil with ten centimetres of sulphuric acid. If the olive oil is pure, there will be a rise of 42° If mixed, the temperature will be 58° for oil of colza ; 65° for beechnut ; 68° for sesame ; 98° for hempseed ; 13° for linseed.

5th. The production of a black hue in the lower part of the test tube, after agitating twenty drops of an alcoholic solution of nitrate of silver with ten grammes of oil and twenty grammes of ether, the flask being kept in the dark, shows the presence of rape-seed oil.

6th. The most difficult adulteration to be detected is that of olive and groundnut oil. These oils have the same density, congeal at the same temperature, and are acted on by sulphuric acid in a similar manner. They can, however, be distinguished as follows: Dissolve cold twelve grammes of mercury in fifteen grammes of nitric acid of 38° Mix this with ninety grammes of the suspected oil, and agitate often during two hours. If the olive is pure, the mixture will become homogeneous. If not, and especially if the mixture becomes filled with carboniferous streaks, the presence of the groundnut oil may be reported.

Compound for Removing Grease Stains from Clothing.—An earthy compound for removing grease spots is made as follows: Take Fuller's earth, free from all gritty matter by elutrition with water; mix with half a pound of the earth so prepared, half a pound of soda, as much soap, and eight yolks of eggs, well beaten up with half a pound of purified ox-gall. The whole must be carefully triturated upon a porphyry slab; the soda with the soap in the same manner as colours are ground, mixing in gradually the eggs and ox-galls previously beaten together. Incorporate next the soft earth by slow degrees, till a uniform thick paste be formed, which should be made into balls or cakes of a convenient size, and laid out to dry. A little of this detergent being scraped off with a knife, made into a paste with water, and applied to the stain, will remove it.

Coating Glass.—To render glass impervious to the direct rays of the sun, but not so opaque as to exclude light, powder some fluorspar and mix it with sulphuric acid, and rub the mixture on the glass with a piece of lead. Then heat the glass on some stove or other arrangement by which the fumes can pass up the chimney; and when cool, wash the plate with dilute solution of potash, and rinse in water.

Editorial.

THE AMENDMENTS TO THE PHARMACY ACT.

The amendments to the Pharmacy Act which will be again submitted to the Legislature, after recess, have been considerably modified since the Bill was officially printed, last year. At that time the measure was reproduced, in full, in the JOURNAL. This had the effect of eliciting an opinion from the English and continental scientific press, and in all cases was the Act favorably received, and in some instances the most commendatory notices were given. The leading English pharmaceutical authority characterized the new measure as being one of the most complete which had appeared in any English-speaking country.

The Committee on Legislation appointed by the present Council, have, however, given to the Act a great deal of thought and attention, during the last six months. It was doubted whether the very element of thoroughness was, after all, a recommendation. Our country is yet immature, and perhaps not ready to receive legislation of so rigid a character. There can be no doubt but had the original measure been passed the cause of pharmacy in Ontario would have been much advanced, but it is possible that this progress would have been made in some degree at the expense of the convenience of pharmacists doing business in the more remote settlements. Taking into account the possibility of such a sequence, we are pleased to think that matters have been so arranged as to render the future working of the Act free from anything even verging on oppression.

We append a summary of those points in which the present draft differs from that of last year :

The first section requires that every person desirous of being apprenticed to a pharmaceutical chemist shall, before his term of apprenticeship commences, furnish to *his employer* a certificate of his having attained a certain grade of education. No further condition is imposed save that of serving an apprenticeship of four years.

Before entering upon the duties of an assistant, or on commencing business as a chemist and druggist, the applicant must furnish to the Registrar evidence of his having served said term of appren-

ticeship, and shall also pass examination and pay fees, and be enrolled as an associate, or member as the case may be. Any associate may commence business at any time without further examination.

Assistants at present so engaged may, before the first day of May next, be registered as such without examination, provided evidence of the fact is given, and also of their having served the aforesaid term of apprenticeship.

Section four has been re-written, as the sense was not quite clear. The section relates altogether to persons who may have served their apprenticeship in places other than this Province. Such persons must submit evidence of their having served as apprentices for three years, and assistant for two years. They may then be examined, and, if successful, entered on the roll as associates or members as the case may be.

In section five the term of service of examiners is limited to two years.

Section eight, amending twenty-eight of the old Act, is amended by striking out all the words of the proviso up to the last line, and the word "without;" and the following is substituted therefor: "without examination, provided such member of the College of Physicians and Surgeons is registered as 'Chemist and Druggist,' under this Act."

Section nine is altered so that the "diploma," and not the "certificate of proficiency," of certain recognized colleges may be received in lieu of examination, and persons registered under the Pharmacy Act of Great Britain 1868, but not members of the Pharmaceutical Society, are not entitled to this privilege.

In section ten the phraseology is rendered more exact by defining the employees of chemists, who are alluded to by the Act, to mean "assistants employed in such capacity."

A typographical error relating to the numbering of the section mentioned in section eleven completes the summary.

BOOKS AS AIDS TO EDUCATION.

Students are generally inclined to place too great reliance in their text-books. The learner desires knowledge, and the text-book

supplies the want, so that, in time, this position of dependance engenders a feeling of respect which oftentimes approaches veneration. The author is regarded as a being beyond the criticism of every-day mortals, and his statements become infallible. That a certain respect is necessary, no one will attempt to deny. To eradicate this feeling altogether, would throw into confusion, and revolutionize entirely, our present system of education. We think, however, that the trust may be too implicit, and that a blind reliance is calculated to damp, if not destroy, the germs of originality. Sooner or later in the life of every educated and thinking man there comes a time when confidence in the statements of authors becomes weakened, and it is seldom till this period of independant thought arrives that much is achieved. The multiplication of books is often only the multiplication of errors, and, according to our opinion, we cannot begin to think for ourselves too early—to enquire into and question our text-books, to try every statement that admits of doubt; not with unsettled mind and shaken confidence swallowing a statement *cum grano salis*, but endeavouring to prove all things, holding fast to that which is good.

On this subject we have never met with anything which better represents our views than a portion of the last opening address delivered by Dr. Payne, to the students of St. Thomas's Hospital, London.

"Scientific books," said the lecturer, "may be like books of travel, intended to describe what the reader has not seen and is never likely to see; or, again, they may be like maps, which give a general outline of a number of objects, too many or too large to be easily embraced in one field of view; or, finally they may be like handbooks for travellers, to draw attention to what the reader can observe for himself. Now, there can be no question about the utility of all these classes of books. No one can see for himself a tenth part, or even, in some sciences, a thousandth part, of the facts upon which any science rests. Hence a great part of our knowledge must always rest upon testimony. This is unavoidable; but still we should endeavour to test such books by our own experience whenever we are able, and at least to gain a direct knowledge of a sufficient number of facts to form a sample of the rest. Without these correctives, feeding on other people's experience—or, as Professor Huxley tersely put it, 'getting up hearsay'—has a very demoralizing effect on the mind. The examination system has much to answer for in requiring so much of it. Original and inventive genius instinctively revolts from second-hand learning. Faraday

used to say that he could never understand a description of anything—he required to see and handle it. I remember a very able and original chemist, now dead, who declared—and I believe truly—that he never read a book in chemistry till he had to lecture to students; and, indeed, to the last he was quite incapable of getting up a text-book, and would have cut, I am afraid, a very poor figure in an examination.

"Of all kinds of books, doubtless the most valuable, especially for beginners, are those of the last class to which I alluded—books which may be compared to the guide-books for travellers; useless without the object before you. It seems a paradox that such books should be needed; but they certainly are so. The most refined observation would not enable us to see a tenth part of what there is to see in a single bone unless the anatomists of former generations had been over the ground before, and marked the salient points. Remember the metaphor of guide-books. I once read, by a French writer, the remark that the chief occupation of English travellers on the Continent appeared to be 'to verify the assertions of their Murray.' You will do well, gentlemen, to spend a large proportion of your time in verifying the assertions of your text-books."

STUDENTS' DEPARTMENT.—In consequence of the limited number of answers received the questions will be continued another month.

Editorial Summary.

PREPARATION OF EMETINA.—On this subject A. Glenard recently presented a paper to the French Academy which was published in the September No. of the *Jour. de Pharm. et de Chimie*, and in abstract in the *Pharm. Jour. & Trans.* for the same month. The author's process is based npon the combined use of lime and ether. It consists in treating with ether a suitably prepared powder, or an extract of ipecacuanha and lime, or the precipitate formed upon adding an excess of lime to a solution obtained by treating ipecacuanha in the cold with water acidulated by sulphuric acid. Either of these mixtures, or the precipitate, when treated with ether, will yield all the alkaloid it contains. The alkaloid may be obtained from the ethereal solution by distilling it to dryness and treating the residue with acidulated water, or by at once shaking the solution with

acidulated water. A more or less acid aqueous liquid is thus obtained, which, upon the addition of ammonia, yields the emetina almost colorless, and much more pure than that produced by the processes ordinarily employed. When water, acidulated with hydrochloric acid, is employed to remove the emetina from the ether, an acid solution is obtained, which, when sufficiently concentrated by evaporation, forms a nearly colorless, solid, crystalline mass of hydrochlorate of emetina. This mass is formed of extremely delicate needles, formed in bundles that radiate around a central point, and form small spheres with an embossed surface, resembling mulberries in appearance. Upon pressing these crystals in a cloth, the more or less colored mother liquor runs off, and the crystals redissolved in water give a colorless solution, from which a fresh crystallization of perfectly pure hydrochlorate of emetina can readily be obtained. It appears that ammonia will not precipitate all the emetina from this salt, as a portion is lost through a decomposing action not fully explained. The formula of emetina is given as $C_{30}H_{22}NO_4$; that of the hydrochlorate as $C_{30}H_{22}NO_4HCz$. The centesimal composition of each is stated as follows:

	Emetina.	Hydrochlorate.
Carbon	72·23	63·00
Hydrogen	8·61	8·15
Nitrogen	5·36	4·75
Oxygen	13·78	11·64
Chlorine	0·00	12·46
	100·00	100·00

GRINDELIA ROBUSTA—AN ANTIDOTE TO RHUS TOXICODENDRON.—The December number of the *Pharmacist* contains a paper which was read by Mr. J. G. Steele, at the last meeting of the American Pharmaceutical Association, and in which an important place in the national Materia Medica is claimed for the plant under consideration. As an antidote to poison oak it has been found infallible, and its happy effects in reducing the frequency and violence of the spasmodic constrictions of the throat and contiguous organs, in asthma and kindred diseases, have often been realized. The Grindelias attracted the attention of the Jesuit Fathers at an early period in the settlement of California, but the *G. Robusta* appears to possess, in the most marked form, the medicinal properties of the family. The plant is a stout perennial, belonging to the *Compositæ*, and resembling a small sunflower. Before flowering, the unexpanded heads secrete a quantity of resinous matter, which is finally distributed, like varnish, over the petals of the flower. In May and June the plant abounds most in this resinous juice, and it is to it that its

medicinal properties are attributed. A fluid extract, made from the leaves and flowering tops of the plant, has been found most useful. This is best made with one part of water to two of alcohol. As it is impracticable to powder the plant, by reason of its sticky balsam or resin, the extract may be made by successive macerations and pressure. A solid extract has also been prepared: equal measures of alcohol and water being used as a menstruum. For poison oak eruptions, the method suggested is, to mix one or two tea-spoonfuls of the fluid extract with half a tumbler of cold or tepid water, and apply freely with a sponge or cloths dipped in the mixture to the parts affected. One or two applications will often suffice for a cure; but if the disease has been of long duration, several days may elapse before entire relief is obtained. In severe cases of poisoning, cloths dipped in the solution may be bound upon the parts, and, if necessary, more of the fluid extract added, thus increasing the strength of the application. The most obstinate case of poisoning will give way to this mode of treatment, and immediately after the first application a most surprising relief is experienced. In cases of asthma, rose cold, and hay fever, ten or twenty drops of the fluid extract may be given every half hour, mixed with sweetened water or milk, until relief is obtained, when the amount and frequency of the dose can be lessened according to the measure of relief obtained. The solid extract is made into pills of three grains each, and given in violent and prolonged attacks of asthma, three times a day, or two of the pills administered for each dose.

Utilization of Old Corks.—Mr. J. B. Moore, (*Am. Jour. Pharm.*) thinks that old corks may be usefully turned to advantage by soaking them for twenty four hours, in hot water; washing them with several portions of clean water; and treating them with a mixture of one part of muriatic acid and fifteen parts of hot water. After a few hours soaking they may be removed, washed and dried, when they will be found almost as white and fresh-looking as when new. Corks taken from bottles containing poisonous, greasy, or very odorous liquids should be rejected, or sorted out previous to treatment. Mr. Moore has employed this process for some time, but we cannot help expressing our opinion that it is very questionable economy, and altogether out of accordance with legitimate practice. For some purposes as the stopping of bottles containing oil, varnish, tar, or such like, it might be pursued with advantage, and some little saving be thereby effected. To go further would be to introduce a source of contamination which at any cost we should avoid.

Nauseous Asafœtida or "Hing" of the Bombay Markets.—Professor Fluckiger contributes to the *Pharm. Jour. and Trans.* a

note in which he alludes to the product of *Ferula alliacea* which was recently described by Professor Dymock in a late paper, a notice of which appeared in this journal. Prof. Fluckiger says that this asafœtida is identical with the third form of the drug as given in his *Pharmacographia*. The odor of Hing is different from that of ordinary asafœtida and more closely resembles that of garlic. Prof. Fluckiger made several experiments to determine whether the essential oil, to which the odor is due, contained sulphur. A few ounces of the drug yielded, by distillation, a gram or two of yellow oil. During the operation an intolerable stench, described as being uncomparably repulsive, was given off. Reagents showed the presence of sulphur, but the author thinks that this oil differs from the sulphuretted oil yielded by ordinary asafœtida.

STANDARD OF QUALITY OF OPIUM IN THE UNITED STATES.—A *Philadelphia Drug Exchange Circular* defines the government standard for opium to be that of the U. S. P., 1860, or seven per cent morphia. It is maintained, apparently on just grounds, that the present Customs' regulation, requiring nine per cent morphia, is not in strict accordance with the law, and that this amount though perhaps correct enough in regard to dried opium, should not be held to apply to opium of commerce, which always contains a considerable proportion of moisture.

Books and Pamphlets.

The Cholera Epidemic of 1873 *in the United States.* The Introduction of Epidemic Cholera through the Agency of the Mercantile Marine; Suggestion of Measures of Prevention. By John M. WOODWORTH, M. D., Supervising Surgeon, U. S. Marine Hospital Service, Washington, Government Printing Office, 1875. 8vo., p.p. 1025.

This volume—one of the latest and most comprehensive on a very prolific subject—contains the results of an investigation made in accordance with a resolution of Congress requiring a report on the facts concerning the spread of the disease and its mode of propagation, with a view to the prevention or limitation of future outbreaks.

The first portion of the work has reference to the clinical history

and etiology of the epidemic of 1873. This is followed by deductions as to means of prevention, including the use of disinfectants, of which class of substances sulphate of iron, lime, and charcoal appear to have the preference.

A chapter by Dr. Peters on the origin of the late epidemic brings us to the narrative of its spread throughout the United States. This occupies nearly four hundred pages and bears evidence of great care in its compilation. It is largely illustrated by maps of infected districts and will prove of great use should the cholera again visit our shores.

The second part of the volume is devoted to a history of the travels of cholera in Asia and Europe, by Dr. Peters; and at various times in North America, by Dr. McClellan.

Not the least valuable portion of this work is that devoted to the bibliography of the subject, embracing an enumeration of books, papers or statistics relating to cholera. Although the compiler—Dr. Barnes—does not claim that the list is altogether complete, we may conclude that there has been little published of any importance of which a notice is not given. The enumeration extends over 315 pages and must contain references to some 9000 works or papers. This list is a most useful contribution to the literature of the subject and will much facilitate research.

The authors of this work do not undertake to decide questions relating to the origin, character, mode of operation, and transportation of cholera which are yet *sub judice*, or to discuss theories, but they have offered a series of propositions condensed from the vast mass of cumulative evidence laboriously collected by a multitude of cholera students in both hemispheres, and presented these conclusions in such a concise and intelligible form that we transcribe them for the benefit of our readers:

"1. Malignant cholera is caused by the access of a specific organic poison to the elementary canal; which poison is developed spontaneously only in certain parts of India, (Hindostan).

2. This poison is contained primarily, so far as the world outside Hindostan is concerned, in the ejections—vomit, stools and urine—of a person already infected with the disease.

3. To set up anew the action of the poison, a certain period of incubation with the presence of alkaline moisture is required, which period is completed in from one to three days; a temperature favoring decomposition and moisture or fluid of decided alkaline reaction hastening the process; the reverse retarding.

4. Favorable conditions for the growth of the poison are found (1) in ordinary potable water, containing nitrogenous organic impurities, alkaline carbonates &c; (2) in decomposing animal and vegetable matter possessing an alkaline reaction; (3) in the alkaline contents of the intestinal portion of the alimentary canal.

5. The period of morbific activity of the poison—which lasts

under favorable conditions, about three days for a given crop—is characterised by the presence of Bacteria, which appears at the end of the period of incubation, and disappear at the end of the period of morbific activity. That is to say, a cholera ejection, or material containing such, is harmless both before the appearance and after the disappearance of Bacteria, but is actively poisonous during their presence.

NOTE.—It is not meant by this that the Bacteria so found are the cholera poison, since they differ in no appreciable manner from Bacteria found in a variety of other fluids, indeed, Lebert hints that the Bacteria may even be the destroyers of the poison.

6. The morbific properties of the poison may be preserved *in posse* for an indefinite period in cholera dejections dried during the period of incubation, or the infection-matter dried during the period of activity.

7. The dried particles of cholera poison may be carried (in clothing, bedding, etc.,) to any distance; and when liberated may find their way direct to the alimentary canal through the medium of the air—by entering the mouth and nose and being swallowed with the saliva—or, less directly, through the medium of water or food in which they have lodged.

8. The poison is destroyed naturally either by the process of growth or by contact with acids; (1) those contained in water or soil; (2) acid gases in the atmosphere; (3) the acid secretion of the stomach.

9. It may also be destroyed artifically (1) by treating the cholera ejections, or material containing them, with acids; (2) by such acid (gaseous) treatment of contaminated atmosphere; (3) by establishing an acid diathesis of the system in one who has received the poison."

Practical Hints on the Selection and use of the Microscope. Intended for Beginners. By John PHIN, Editor of the *Technologist*, New York. The Industrial Publication Company, 1875. 12mo. p.p. 131.

This little work is of a purely practical character and calculated to be of considerable service to those desirous of making themselves acquainted with the construction, selection, and use of the microscope. It is not designed to supplant larger treatises, as those of Beale, Carpenter, or Hogg, but simply to supply aid to beginners. This object has been very thoroughly carried out, and once the student becomes familiar with the suggestions and instructions thus concisely laid down for his guidance he will be very creditably equipped for microscopical practice. The book is entirely free from any attempt at covert advertising, or trade recommendation, but appears to have been written with the sole view of supplying a cheap and practical microscopical guide. The price of the work is 75 cents Am. Cy.

The Chemists' and Druggists' Diary, 1876. Office of the *Chemist & Druggist*, 44 Cannon street, London, England.

The eighth edition of this annual has just come to hand and we can in all sincerity say that we are not aware of any diary so well suited to the requirements of the pharmacist, or indeed do we know of any diary which for handiness or convenience in using, will at all compare with it. The present edition contains diary pages, on good paper, and other skeleton pages useful for pharmaceutial or commercial memorandum, all interleaved with blotting paper. In addition to this there is a summary of all the laws affecting chemists and druggists, and the various Acts are given in full or in abstract. There are also tables, formulas, &c., calculated to be of special advantage to the pharmacist in his daily avocations.

Vick's Floral Guide for 1876. Published quarterly by James VICK, Rochester, N. Y., U. S.

We are always pleased to notice Mr. Vick's periodical publications. They are beautifully printed and illustrated, and, throughout, the interests of the customer are quite as well regarded as those of the author. The plan of the present number is modified so that, in time, there will be presented a variety of information on floriculture which no gardener can afford to be without.

Report of the Quebec Lunatic Asylum, 1874. Addressed to the Honorable the Prime Minister of the Province of Quebec, by the Medical Superintendent, Quebec, 1875. 8vo. p.p. 161.

Tinnitus Aurium, or Noises in the Ears. Second edition, with Cases, by Laurence TURNBULL, Ph. G., M. D.
Reprinted from the Philadelphia Medical Times, Philadelphia. J. B. Lippincott & Co., 1875.

The Public Health Almanac for 1876. Edited by Frederick Hoffmann. E. Stieger, Frankfort Street, New York.

Manitou (Colorado) its Mineral Waters and Climate; by S. E. Solly, M. R. C. S. Eng., etc. Saint Louis, 1875.

Varieties.

How TO MAKE SACHETS OR SCENT-BAGS.—Various powders, etc., placed in silk bags or ornamental envelopes, are agreeable to smell of, and also economical for imparting a pleasant odor to linen and clothes as they are packed in drawers, as they prevent moths. For heliotrope powder, take half a pound of orris root, one-quarter pound of ground rose leaves, two ounces powdered tonquin bean, one-half dram grain musk, two drops otto of almonds; mix it all by sifting through a coarse sieve. This

is one of the best sachets often made, and perfumes table-cloths, sheets, pillow-cases and towels deliciously. For lavender powder, take one pound of powdered lavender, one-quarter pound of gum-benzoin, and one-quarter of an ounce of otto of lavender. For patchouli, use one-half a pound of patchouli ground fine, and a very little of otto patchouli. This herb is often sold in its natural state as imported, and is tied up in half-pound bundles. Sandal wood sachet powder is good, and consists of the wood ground fine. Cedar wood, when ground, forms a body for other powders, and will keep moths at a distance. Dried fennel, when ground, is also used for scent-bags, and ground nutmeg is liked for this purpose.

Registrar's Notices.

Renewals Continued.

Adamson, E., Oil Springs.
Cooke, Fred., Orillia.
Detlor, W. S., Napanee.
Deyell, R., Port Hope.
Garland, L., Hamilton.
Geen, A. L., Belleville.
Gordon, Martha M., Port Colborne
Graham, J. Y., Galt.
Gray, R. B., Pembrokc.
Hacking, J. A., Listowel.
Hildreth, A. R., Paisley.
Huffman, T. C., Napanee.
Hunter, J. F., Orillia.
Jackson, Geo., Egmondville.
Jamieson, T. A., Lancaster.
Jaques, H. W., Merrickville.
Johnston, Jas., Sydenham.
King, J. C., Kingston.
Lea, J. W., Port Rowan.
Magann, G., Hamilton.
Matchett, Thos., Omemee.
McKenzie, R., Lucknow.
McLean, G. S., Sarnia.
Nelles, R. A., Duart.
Petrie, A. B., Guelph.
Rosser, H., London.
Scott, J. R., Napanee.
Sproule, G. R., Brantford.
Strong, W. T., London.
Terryberry, J. G., Drumbo.
Urquhart, J., Oakville.
Walton, E., Peterboro.

New Registrations.

Chapman, Saml., Hamilton.
Peacocke, John, Toronto.
Sherwood, John, Sutton.

Those members who have not paid their Renewal Fee for 1875, are requested to do so at once, to save legal proceedings being taken.

Journals wanted. See advertisement.

GEO. HODGETTS, Registrar,
305 Yonge Street, Toronto.

DRUGS, MEDICINES, &c.	$ c.	$ c.
Acid, Acetic, fort	0 13 @	0 14
Benzoic, pure	0 22	0 27
Citric	1 05	1 15
Muriatic	0 03½	0 05
Nitric	0 10	0 13
Oxalic	0 20	0 23
Sulphuric	0 03	0 05
Tartaric, pulv	0 49	0 50
Ammon, carb. casks	0 22	0 24
" jars	0 23	0 24
Liquor, 880	0 25	0 28
Muriate	0 14	0 15
Nitrate	0 45	0 60
Æther, Acetic	0 45	0 50
Nitrous	0 40	0 42
Sulphuric	0 50	0 50
Antim. Crude, pulv	0 15	0 17
Tart "	0 52	0 60
Alcohol, 95 per ct.....Cash	2 19	0 00
Arrowroot, Jamaica	0 18	0 22
Bermuda	0 50	0 65
Alum	0 02½	0 03½
Balsam, Canada	0 33	0 38
Copaiba	1 10	1 15
Peru	3 40	3 75
Tolu	3 00	3 50
Bark, Bayberry, pulv	0 18	0 20
Canella	0 17	0 20
Peruvian, yel. pulv	0 35	0 50
" red "	1 60	1 70
Slippery Elm, g. b	0 18	0 20
" flour, packets	0 28	0 32
Sassafras	0 15	0 18
Berries, Cubebs, ground	0 20	0 25
Juniper	0 06	0 10
Beans, Tonquin	0 62	1 10
Vanilla	14 00	20 00
Bismuth, Alb	2 50	2 75
Carb.	2 65	2 90
Camphor, Crude	0 33	0 40
Refined	0 43	0 47
Cantharides	1 85	1 90
Powdered	2 00	2 10
Charcoal, Animal	0 04	0 06
Wood, powdered	0 10	0 15
Chiretta	0 23	0 30
Chloroform	1 10	1 55
Cochineal, S. G	0 58	0 70
Black	0 75	0 90
Colocynth, pulv	0 60	0 65
Collodion	0 70	0 80
Elaterium	3 20	4 00
Ergot	0 70	0 75
Extract Belladonna	1 65	1 80
Colocynth, Co	1 25	1 75
Gentian	0 50	0 60
Hemlock, Ang	0 00	0 95
Henbane, "	3 00	3 20
Jalap	5 00	5 50
Mandrake	1 75	2 00
Nux Vomic	0 40	0 50
Opium	1 10	
Rhubarb	5 00	5 50
Sarsap. Hon. Co	1 00	1 20
" Jam. Co	3 50	4 00
Taraxacum, Ang	0 70	0 80
Flowers, Arnica	0 17	0 25
Chamomile	0 28	0 32
Gum, Aloes, Barb. extra	0 70	0 80
" " good	0 40	0 50
" Cape	0 16	0 20
" " powdered	0 20	0 30
" Socot	0 50	1 35
" pulv	1 00	0 00
Arabic, White	0 38	0 60
" powdered	0 60	0 75
" sorts	0 19	0 24
" " powdered	0 42	0 50
" com. Gedda	0 13	0 16
Assafœtida	0 40	0 42
British or Dextrine	0 13	0 15
Benzoin	0 35	0 75
Catechu	0 12	0 15
" powdered	0 25	0 30
Euphorb, pulv	0 35	0 40
Gamboge	1 00	1 20
Guaiacum	0 45	1 00
Myrrh	0 50	0 85

DRUGS, MEDICINES, &c.—*Contd.*	$ c.	$ c.
Sang Dracon	0 60	
Scammony, powdered	5 50	6 00
" Virg. "	14 50	—
Shellac, Orange	0 75	0 80
Gum, Shellac, liver	0 55	0 60
Storax	0 40	0 45
Tragacanth, flake	1 10	1 75
" common	0 53	0 65
Galls	0 22	0 30
Gelatine, Cox's 6d	1 15	1 20
Glycerine, common	0 18	0 23
Vienna	0 25	0 28
Prices	0 60	0 75
Honey, Canada, best	0 16	0 17
Lower Canada	0 14	0 16
Iron, Carb. Precip	0 20	0 25
" Sacchar	0 40	0 55
Citrate Ammon	1 40	1 50
" & Quinine, oz	0 52	0 55
" & Strychine	0 20	0 25
Sulphate, pure	0 08	0 10
Iodine, good	3 90	4 20
Resublimed	5 10	5 50
Jalapin	1 25	1 50
Kreosote	2 40	2 50
Leaves, Buchu	0 22	0 32
Foxglove	0 25	0 30
Henbane	0 35	0 40
Senna, Alex	0 27	0 60
" E. I.	0 14	0 20
" Tinnevilly	0 20	0 30
Uva Ursi	0 15	0 17
Lime, Carbolate.....brl	5 50	—
Chloride	0 05	0 06
Sulphate	0 08	0 12½
Lead, Acetate	0 15	0 16½
Leptandrin.....oz.	0 60	—
Liq. Bismuth	0 50	0 60
Lye, Concentrated	1 40	1 50
Liquorice, Solazzi	0 50	0 55
Cassano	0 23	0 40
Other brands	0 14	0 25
Liquorice, Refined	0 35	0 45
Magnesia, Carb. 1 oz.	0 20	0 25
" 4 oz.	0 19	0 20
Calcined	0 65	0 75
Citrate.....gran.	0 60	0 75
Mercury	1 25	1 35
Bichlor	1 30	1 50
Chloride	1 50	1 70
C. Chalk	0 65	0 70
Nit. Oxyd	1 70	1 90
Morphia Acet	3 00	3 20
Mur.	3 00	3 20
Sulph	3 20	3 40
Musk, pure grain.....oz	25 00	—
Canton	0 60	1 20
Oil, Almonds, sweet	0 45	0 47
" bitter	14 00	15 00
Aniseed	4 25	4 50
Bergamot, super	6 50	7 00
Caraway	3 20	3 50
Cassia	2 00	2 25
Castor, E. I	0 12½	0 14
Crystal	0 22	0 25
Italian	0 26	0 28
Citronella	1 05	1 15
Cloves, Ang	3 75	3 80
Cod Liver	1 50	1 60
Croton	1 40	1 50
Juniper Wood	0 80	1 00
Berries	2 75	3 00
Lavand, Ang.....oz.	0 00	1 00
Exotic	1 25	1 50
Lemon, super	3 80	4 00
ord	3 20	3 40
Orange	3 00	3 25
Origanum	0 65	0 75
Peppermint Ang	15 00	16 00
" Amer.	5 00	6 00
Rose, Virgin	8 50	8 75
" good	7 00	7 25
Sassafras	0 75	1 90
Wintergreen	4 40	4 60
Wormwood, pure	4 00	6 00
Ointment, blue	1 10	1 20
Opium, Turkey	6 25	6 50
pulv	8 50	9 00

DRUGS, MEDICINES, &c.—*Cont'd*	$ c.	$ c
Orange Peel, opt.	0 35	0 36
" good	0 15	0 20
Pill, Blue, Mass.	1 10	1 20
Potash, Bi-chrom	0 16	0 18
Bi-tart	0 33	0 35
Carbonate	0 14	0 20
Chlorate	0 32	0 35
Nitrate	8 00	9 00
Potassium, Bromide	60	0 70
Cyanide	0 60	0 70
Iodide	3 30	3 50
Sulphuret	0 25	0 35
Pepsin, Boudault's...oz	1 40	—
Houghton's... doz.	8 00	9 00
Morson's...oz.	0 85	1 10
Phosphorous	1 10	1 20
Podophyllin	0 50	0 60
Quinine, Pelletier's	—	2 45
Howard's	2 17	—
" 100 oz. case.	2 12	—
" 25 oz. tin..	2 12	—
Root, Colombo	0 13	0 20
Curcuma, grd	0 12½	0 17
Dandelion	0 17	0 20
Elecampane	0 16	0 17
Gentian	0 08	0 10
" pulv	0 15	0 20
Hellebore, pulv	0 17	0 20
Ipecac, "	1 50	1 60
Jalap, Vera Cruz	90	1 15
" Tampico	0 70	1 00
Liquorice, select	0 12	0 13
" powdered	0 15	0 20
Mandrake "	0 20	0 25
Orris, "	0 20	0 25
Rhubarb, Turkey	2 .0	2 25
" E. I.	0 75	0 90
" " pulv	1 60	1 10
" " 2nd	0 60	0 70
" French	0 75	—
Sarsap., Hond	0 60	0 65
" Jam	0 95	1 00
Squills	0 10	0 15½
Senega	1 00	1 10
Spigelia	0 25	0 30
Sal., Epsom	2 50	3 00
Rochelle	0 30	0 32
Soda	0 02½	0 03
Seed, Anise	0 13	0 16
Canary	0 15	0 17
Cardamon	2 00	2 10
Fenugreek, g'd	0 08	0 09
Hemp	0 06½	—
Mustard, white	0 14	0 16
Saffron, American	0 75	0 85
Spanish	10 00	11 00
Santonine	8 50	8 75
Sago	0 08	0 09
Silver, Nitrate...Cash	14 85	16 50
Soap, Castile, mottled	0 11	0 14
Soda, Ash	0 03½	0 05
Bicarb. Newcastle	5 75	6 25
" Howard's	0 14	0 16
Caustic.	0 05½	0 05¾
Spirits Ammon., arom	0 35	0 35
Strychnine, Crystals	2 00	2 20
Sulphur. Precip	0 10	0 12½
Sublimed	0 03½	0 05
Roll	0 03	0 04½
Vinegar, Wine, pure	0 55	0 60
Verdigris	0 35	0 40
Wax, White, pure	0 70	0 80
Zinc. Chloride...oz	0 10	0 15
Sulphate, pure	0 10	0 15
" common	0 06	0 10
DYESTUFFS.		
Annatto	0 35 @	0 60
Aniline, Magenta, cryst	2 65	2 80
" liquid	2 00	—
Argols, ground	0 15	0 25
Blue Vitrol, pure	0 09	0 10
Camwood	0 07	0 08
Copperas, Green	0 01½	0 02
Cudbear	0 16	0 25
Fustic, Cuban	0 03	0 04
Indigo, Bengal	2 40	2 50
Madras	0 85	0 90
Extract	0 26	0 30

DYESTUFFS—*Continued.*		
Japonica	0 07	0 08
Lacdye, powdered	0 33	0 38
Logwood	0 01½	0 03
Logwood, Camp	0 02½	0 03
Extract	0 12½	0 13
" 1 lb. bxs	0 15	—
" ½ lb. "	0 14	0 18
Madder, best Dutch	0 11	0 11
2nd quality	0 10	0 05
Quercitron	0 03	0 08
Sumac	0 06	0 12½
Tin, Muriate	0 10½	0 06
Redwood	0 05	
SPICES.		
Allspice	0 11½ @	0 12
Cassia	0 26	0 28
Cloves	0 55	0 60
Cayenne	0 22	0 28
Ginger, E. I.	0 19	0 20
Jam	0 30	0 30
Mace	1 40	1 60
Mustard, com	0 20	0 25
Nutmegs	1 15	1 25
Pepper, Black	0 20	0 21
White	0 31	0 32
PAINTS, DRY.		
Black, Lamp, com	0 09 @	0 10
" refined	0 25	0 30
Blue, Celestial	0 08	0 12
Prussian	0 65	0 75
Brown, Vandyke	0 10	0 12½
Chalk, White	0 01	0 01½
Green, Brunswick	0 07	0 10
Chrome	0 16	0 25
Paris	0 30	0 35
Magnesia	0 20	0 25
Litharge	0 07	0 09
Pink, Rose	0 12½	0 15
Red Lead	0 07½	0 08
Venetian	0 02½	0 03½
Sienna, B. & G	0 07	0 08
Umber	0 07	0 10
Vermillion, English	1 50	1 60
American	0 25	0 35
Whiting	0 1	0 18
White Lead, dry, gen.	0 08½	0 09
" " No. 1	0 07	0 08
" " No. 2	0 05	0 07
Yellow Chrome	0 12½	0 35
" Ochre	0 02½	0 03½
Zinc White, Star	0 10	0 12
COLORS, IN OIL.		
Blue Paint	0 12 @	0 15
Fire Proof Paint	0 06	0 08
Green, Paris	0 30	0 37½
Red, Venetian	0 07	0 10
Patent Dryers, 1 lb tins	0 11	0 12
Putty	0 03½	0 04½
Yellow Ochre	0 08	0 12
White Lead, gen. 25 lb. tins	2 45	—
" No. 1	2 20	—
" No, 2	1 95	—
" No. 3	1 70	—
" com	1 30	—
White Zinc, Snow	2 75	3 25
NAVAL STORES.		
Black Pitch	3 90 @	4 25
Rosin, Strained	3 30	7 25
Clear, pale	5 75	6 50
Spirits Turpentine	0 53	4 25
Tar Wood	3 90	
OILS.		
Cod	0 65 @	0 70
Lard, extra	1 10	1 20
No. 1	10¡	1 10
No. 2	0 90	0 95
Linseed, Raw	0 57	0 62
Boiled	0 62	0 64
Olive, Common	1 05	1 10
Salad	1 80	2 30
" Pints, cases	4 20	4 40
" Quarts	3 25	3 50
Seal Oil, Pale	0 67½	0 70
Straw	0 6	0 65
Sesame Salad	1 30	1 35
Sperm, genuine	2 55	
Whale refined		