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CANADIAN

PHARMACEUTICAL JOURNAL

VOL. V, No. 2. TORONTO, SEPTEMBER, 1871. WHOLE No. XLI.

Original and Selected Papers.

ON THE APPROXIMATE MEASUREMENT OF LIQUIDS AS APPLIED TO MEDICINE.

BY E. B. SHUTTLEWORTH.

The employment of articles in domestic use for apportioning doses of medicine is almost universal. An examination of a fyle representing the prescriptions of a large number of our physicians, revealed the fact, that of every hundred prescriptions, in which liquids were to be dispensed, sixty-two were ordered in tea-spoonfnl doses, twenty-eight in table-spoonfuls, nine in dessert-spoonfuls, and the remaining dose in that of a wine-glassful. The convenience of this system outweighs all considerations which might be urged against it; it appears strange, however, and not a little inconsistent, that in the dispensing of medicine such care and nicety should be required, while its administration is allowed to be performed in a manner which, at best, can only approximate to correctness.

The older works on pharmacy, as well as those of recent date, give, under the title "approximate measurement," a table of the quantities of liquid which are supposed to correspond, as nearly as possible, with these common measures: thus we learn that:

A *teacup* contains about four fluid ounces.
" *wineglass* " " two fluid ounces.
" *tablespoon* " " half a fluid ounce.
" *dessert-spoon* " two fluidrachms.
" *teaspoon* " " one fluidrachm.
" *drop* is equal to about one minim.

To demonstrate *how near* these measures coincide is the object of this paper, and to this end, a few experiments have been made which, together with some facts obtained from other sources, are now laid before the reader.

The habit of prescribing medicine to be administered in drops is fast falling into disuse. Indeed, in regular practice, it may be said to have ceased altogether. It frequently happens, however, that some of the quantities ordered in prescription are regulated by this mode of measurement. This is especially the case with regard to the essential oils; and, unfortunately with many of the recent class of fluid extracts, many of which are ordered *guttatim*. In domestic practice, this mode is almost universal; and of all others, the stronger preparations, such as laudanum, are so estimated.

Various experiments have been made to determine the size of drops; amongst others, those of Alsop and Shuttleworth of England, and Durand and Procter, of America, may be mentioned as furnishing the chief authority on which the statements published in pharmaceutical works are founded. The first of these investigators found the size of drops to vary with the size and shape of the vessels from which they were allowed to fall. To remedy this an ingenious and simple little instrument was constructed which bears the name of Alsop's *minimeter*. A list of the number of drops afforded by a fluidrachm of different liquids as dropped from the minimeter, was given; from this we learn, that drops of different liquids have not all the same size, but under similar conditions, represent, severally, *tolerably* constant quantities. We need not detail the values assigned to drops of the liquids examined but refer the reader for further information on this part of the subject to the list of works appended below.*

From an examination of the records of the experiments referred

* Alsop. *Mohr & Redwood's Practical Pharmacy*, p. 46.
Shattleworth. *Parcira's Prescription Book*, p. 114.
Durand. *Journal of the Phila. Col. of Pharm.*, 1, 169, or *U.S. Dispensatory*, p. 1638, 12th ed.
Proctor. *U. S. Dispensatory*, 12th ed., p. 1247.

to, and also from a large number of trials made by the writer, the conditions which affect the formation and size of drops may be shortly summed up as follows: (1) the kind of liquid; (2) its temperature; (3) the size and shape of the edge or lip of the vessel; (3) its chemical cleanliness; (4) the inclination of the vessel; (5) the superincumbent pressure of liquid.

It will be acknowledged that to attend to all the above conditions regarding the measurement of a drop would be both difficult and absurd, and it may be urged that, after all, a drop is only an approximate quantity, representing a fixed measure near enough for practical purposes; that druggists and others are already well aware that drops and minims do not always correspond, but that the value of the drops of each kind of liquid, subject to this mode of measurement, is laid down by various authorities, and well understood. The instance of tincture of opium, which is said to furnish 120 drops to the drachm, may be cited. To show the incorrectness of this, and also to demonstrate the absurdity of the whole system, the record of a few experiments may be given. The number of minims represented by one fluid drachm of laudanum when dropped from various vessels, was as follows:

1 drachm measure	130	minims.
4 oz. bottle, with deep, round lip	50	"
½ gal. bottle	76	"
1 quart stoppered shop bottle	90	"
" " 2nd trial	100	"
Experiments of E. Durand	120	"
" " Mr. Shuttleworth, England	134	"
" " Mr. Alsop, "	135	"
" " " (large bot)	84	"

As the size of teaspoons is controlled by the demands of fashion, a considerable variation may be expected in spoons of different ages. As a general rule, however, they are made much larger than formerly and appear to have steadily increased in size from the teaspoon of the last century, which was not much over one-third that of the present day. About a hundred years ago the average capacity was about 37 minims. At that time, and indeed until the present century, teaspoons were generally made of silver. It may be that from their superior value they have been more carefully preserved than those of other at metal; all events, there are many families who possess some of these relics, and in not a few instances, "the medi-

cine spoon," is of this kind. Where such is used it is obvious that the patient gets but little over one-half the dose of medicine intended by the physician. In order to estimate fairly, the capacity of those teaspoons in common use, a large number comprising every ordinary style and age was procured. From these, ten spoons were selected as representatives of the lot. Each spoon was carefully filled with water, at a temperature of 60 F. In order to insure uniformity, a straight edge made of a strip of tin was passed over the liquid, sweeping off the convexity of the surface, and leaving what might be taken as the true contents. The measure of each spoon, as indicated by a minum graduate, which was previously ascertained to be correctly marked, was carefully noted, and the operation was repeated a number of times so that an average might be made. The number of minims contained by each was as follows:

55, 55, 70, 72, 75, 80, 85, 90, 95, 97.

From this it will be seen that the average capacity of ordinary spoons is over 77 minims, and supposing such to be used for the administration of any medicine under the assumption that it contained a fluidrachm, the quantity given would be almost one-third larger than that intended.

From conversation with one of our largest manufacturers and dealers in table ware, it was ascertained that teaspoons are made, at present, of three sizes, which may be known as large, medium, and small. Samples of each of these were procured and their contents measured with the following result:

Large teaspoon, 95 minims.
Medium " 85 "
Small " 60 "

The average capacity of modern spoons may, therefore, be taken at 80 minims; which is exactly one-third more than commonly stated. Taking this into account, and also bearing in mind that there is one chance in three that a patient, by employing the largest spoon, may get over half as much more medicine than was intended, it seems necessary that the scale of approximate measurement should undergo a thorough revision.

Dessert-spoons are liable to the same objections as tea-spoons—invariably containing more than the specified quantity of liquid. A number of those in common use were examined in the manner above mentioned, the average capacity being:

Large dessert-spoon 3.3 drachms, or 200 minims.
Small " 2.5 " or 150 "

Table-spoons have also increased in size; the average contents being:

Large table-spoon, 6 fluidrachms.
Small " 4.5 "

It will be seen that scarcely ever do any of these measures approach that which they are supposed to represent. In some cases the approximation is no closer than that which exists between a pint and a quart, which can certainly be said to be no approximation at all. Even the average quantites are far wide of the mark and by no means exact enough for the commonest purposes.

No experiments were made with either teacups or wine-glasses, as the former are seldom or never used to measure medicine, and the latter in cases only where the exactness of the dose is not of material consequence.

In conclusion, the writer would strongly advise the necessity of the total abandonment of the practice of measurement by drops, and advise the substitution of the minim measure. If the precaution be taken to rinse out the measure with a small quantity of the vehicle or diluent, which almost invariably forms a part of the prescription, in which strong medicines are ordered, results as accurate as need be may always be attained.

Physicians ordering tea-spoonful, dessert-spoonful or table-spoonful doses of medicine should always specify that *small* spoons be used. In this case the possibility of giving an underdose is exceedingly remote, the chances still being that the quantity will be over the mark. It will be noted that the small sized spoon, of modern manufacture, holds as near 60 minims as possible, and if this could be alone employed for the measurement of doses up to half a fluidounce it would be a decided advantage. The dessert-spoon might well be abandoned entirely, as the measuring of two tea-spoonfuls is almost as convenient, and far more likely to be correct.

TINCTURE OF HYOSCYAMUS.*

BY M. DONOVAN.

Some years since I published, through the medium of the *Medical Press*, an account of the trials made on myself and others, with a view to discover what doses of tincture of hyoscyamus should be given in order to produce its sedative effects. The experiment was made on several persons, beginning with a drachm dose, increasing it to six drachms, and in my own case to one ounce, of the tincture of the Dublin Pharmacopœia. In no case were any effects observed beyond dryness of the throat and fauces. The experiments were made with tinctures prepared from the dry leaves of garden-grown plants, from wild plants collected in a mountainous district of North Wales, and from the leaves dried and undried.

I was under the impression that some of the plants employed in making the tinctures on which I experimented were in the second year of their growth, but the trials now to be described have convinced me that none of them could have been more than one year old. At that time I was not acquainted with the means which I have since discovered of testing the age of the plant.

I satisfied myself by these experiments that tincture of hyoscyamus prepared, as I believe it generally is in this country, from leaves of one year's growth, is all but powerless. I was strengthened in this opinion by finding that M. Hertz has given upwards of fifteen grains of the extract, most probably made from the plant in its first year, without any sensible effect.

Mr. Houlton had long before affirmed the inertness of the one-year old plant, and the activity of that of two years old.

In order to come to some determination on this subject I adopted means of procuring a tincture certainly made from the latter, and from trials with it soon convinced myself that it was an article of very different value from the tincture of the one year old plant, and that all my former experiments must have been made with the latter, although I was led to believe that, in some of them, the plant of two years' growth had been used.

My first trial was on myself. I took one drachm, and for an hour or two felt no effect beyond dryness of the mouth. On a subsequent occasion I took two drachms, and in two hours had proof that I had taken a sufficiency. My sensations were indescribable: one was a feeling of uncertainty of my steps in walking, although they were really quite steady, and a slight sensation of giddiness. This trial convinced me that I had taken as full a dose as prudence would permit. To a lady who suffered from headache I gave, at her own request, one drachm of this tincture. In about two hours she

*From the Dublin Medical Press and Circular.

felt so overcome by sleepiness that she could scarcely keep her eyes open; the headache was however, greatly relieved. On another occasion she took a similar dose, and, being in bed, she soon fell into "a delightful sleep," and, on waking, found that the headache was almost gone; but she complained of dryness of the fauces and throat, although on the first occasion she did not experience either of these effects. Some months after the same lady suffered from headache, and did not receive any benefit from a similar dose; nor did another person experience any relief from toothache nor any other effect beyond slight dryness of the fauces, which soon passed off.

Convinced by the foregoing considerations that the medicinal properties of hyoscyamus reside exclusively in the plant of two years old, and that the plant of one year's growth is therefore useless, I sought to discover an easy test by which the age of the plant from which a given tincture has been prepared could be determined. The following has at least the advantage of simplicity: Add a little of the tincture to a glass of water; if the mixture become slightly milky, the tincture was made from a two-year old plant; if it remain transparent, the plant was in its first year.

The British Pharmacopœia gives no information as to what shall be the age of the hyoscyamus from which the tincture is to be made; it is therefore, a matter of chance whether it will have any effect or be powerless. Given in the dose of twenty or thirty drops, as is sometimes done, it is hard to believe it can have any effect in either case.

IMPROVED METHODS FOR PREPARING SOME OFFICINAL AND NON-OFFICINAL SYRUPS.*

BY R. ROTHER.

SYRUP OF IPECACUANHA.

According to the pharmacopœia, syrup of ipecacuanha is prepared by mixing the fluid extract with simple syrup; the fluid extract, having been made officinal for that especial purpose, is obtained by an impracticable, inconvenient, and tedious process, which consists in exhausting the root in fine powder by percolation with three parts of officinal alcohol (sp. gr. 835—85 per cent). The percolate evaporated to a syrupy liquid, mixed with acetic acid and water and boiled down to a certain limit, the residue filtered and added to an equal bulk of alcohol. After taking all this pains, the pharmaceutist finds, to his utmost chagrin, that this syrup of ipecac be-

*From the Pharmacist.

comes, nevertheless, cloudy. To remedy this evil and the unnecessary expenditure of costly material and ill-repaid effort, the following modification is offered as an undeniable improvement.

A fluid extract of ipecac, to conform in strength with the officinal, is first prepared by *repercolating* any convenient quantity of the root in moderately fine powder (passed through a sieve of 50 meshes to the linear inch), and divided into three equal parts, with a mixture of three parts of officinal alcohol (85 per cent.), and one of water; and to make syrup of ipecacuanha.

Take of this fluid extract, 2 fluid ounces.
Sugar, twenty-eight troy ounces.
Water, a sufficient quantity.

To the fluid extract add 2 fluid ounces of water and heat the mixture to the boiling point; then add 12 fluid ounces of water, filter, and pour sufficient water through the filter to make the liquid measure one pint; in this dissolve the sugar with the aid of heat, and strain through muslin. This syrup can also be prepared by mixing the same quantity of officinal fluid extract with sufficient water to make the measure of a pint, letting the mixture rest several hours, then filtering and proceeding as above. Both preparations will be perfectly clear, beautiful, identical in strength and appearance, but the former possesses the natural odor and taste of ipecac in an eminent degree, which cannot be claimed as strictly the same in case of the latter.

SYRUP OF LACTUCARIUM

The officinal syrup is an unsightly affair, and the process is particularly weak, requiring that lactucarium, first rubbed with diluted alcohol to a syrupy liquid, be exhausted by percolation with that menstruum, that the percolate be then evaporated to a small bulk, and mix with hot simple syrup. The performance of the percolation entails the difficulty, and is tedious beyond measure; for which the pharmaceutist's recompense is an exceedingly ugly preparation in its outward appearance.

But all these obstacles vanish before the fact that lactucarium is completely exhausted by boiling water, with the consequent coagulation of its albumen, and further that the aqueous extract is perfectly clarified by magnesium carbonate. From these data we derive the formula for syrup of lactucarium.

Take of Lactucarium, one troy ounce.
Magnesium carbonate, 120 grains.
Sugar, fourteen troy ounces.
Water, a sufficient quantity.

Triturate the lactucarium to powder, and heat it with eight fluid ounces of water to the boiling point; maintain that temperature a few moments, and then strain the liquid off by wringing the mixture through muslin; add the strained liquid gradually to the magnesium

carbonate with constant trituration, and filter through paper, pouring sufficient water through the filter to make the filtrate measure eight fluid ounces, in which dissolve the sugar with heat, and strain through muslin. The product is, to say the least, elegant.

SYRUP RHUBARB.

The officinal process for fluid extract of rhubarb is not of the most desirable nature. It consists in percolating rhubarb, in moderately fine powder, with officinal alcohol, until a certain measure is obtained, setting this aside to evaporate spontaneously, and continuing the exhaustion with diluted alcohol, evaporating this residuary percolate, adding sugar, and then the first part of the percolate, and again evaporating to a certain measure. This fluid extract is mixed with simple syrup, and produces the officinal syrup of rhubarb, which is rendered a very unsightly preparation by the precipitation of objectionable resin.

In the modified process a fluid extract of rhubarb equal to the officinal in strength, is first obtained by repercolating rhubarb, in moderately fine powder, with a mixture of three parts of officinal alcohol and one of water. This menstruum exhausts rhubarb completely with the greatest facility, since the inert viscid matters are not taken up by it. To make the syrup—

Take of this fluid extract three fluid ounces.
Sugar, twenty-eight troy ounces.
Water, a sufficient quantity.

Add the fluid extract to 12 fluid ounces of water, filter, make up the filtrate to the measure of a pint by adding water through the filter, and dissolve it in the sugar with the aid of a gentle heat, and strain through muslin. The result is splendid. An equal product is obtained by mixing the officinal fluid extract with water, letting it repose some hours, filtering, and then completing as above.

SYRUP SENEKA.

Through the anomalous process the intended requirements of the pharmacopœia for this officinal are placed beyond the reach of the pharmaceutist. The root, in moderately fine powder, is exhausted by percolation with diluted alcohol, the resulting percolate evaporated to a given measure, and the sugar dissolved in the residual liquid after filtration. Firstly, diluted alcohol is not a proper menstruum, owing to the large amount of a viscid constituent of the root, as in case of its presence complete exhaustion is effected but slowly and with difficulty. Secondly, evaporation and boiling of the percolate does not entirely remove the viscid matters, and therefore renders the filtration of the final liquid very troublesome; moreover, after the solution of the sugar in the perfectly clear filtrate, the syrup again assumes a very turbid appearance.

The improved method comprises, first, the formation of a fluid extract of seneka, and its production rests upon the circumstance that seneka root, in moderately fine powder, is completely exhausted with less than three parts of officinal alcohol (85 per cent), to the exclusion of pectin, mucilage, and albuminous matter. This fact is ascertained by percolating seneka after its treatment with diluted alcohol, to which neither color nor taste are imparted, and that the percolate with officinal alcohol yields, on evaporation, a perfectly clear and transparent brown extract. The fluid extract of seneka, of which every fluid ounce represents one troy ounce of the root, is prepared by repercolating any convenient quantity of seneka in moderately fine powder, and divided into three equal parts, with officinal alcohol (85 per cent.). To make syrup of seneka:

Take of this fluid extract, four fluid ounces.
Magnesium carbonate, 240 grains.
Sugar, sixteen troy ounces.
Water, sufficient.

Evaporate the fluid extract, by means of a sand or water bath, to a syrupy liquid, mix this with the magnesium carbonate, by trituration, and gradually add eight fluid ounces of water, constantly stirring; filter, and add sufficient water, through the filter, to make the liquid measure eight fluid ounces, then dissolve in it the sugar, with the aid of heat, and strain through muslin while hot. The product, for its permanence and elegant appearance, cannot be surpassed.

To prepare this syrup directly from a fluid extract by merely mixing that with simple syrup, would render the preparation uncommonly thin, and introduce such an excessively large proportion of alcohol, which would be an unquestionable and serious objection.

COMPOUND SYRUP OF SQUILL,

Which, in consideration of the superior claims attached to seneka its most important component, rightly should be entitled compound syrup of seneka, if there is anything in a name.

We are forced to acknowledge, with feelings of regret, that by cause of a defective formula, and the consequent instability of its product, pharmaceutists have but too good a pretext for disregarding the officinal injunctions relating to this important and popular preparation, and in view of the present recognized formula, the fact becomes painfully apparent that the extensive literature centred about this nucleus has been of no avail.

The syrup, as made according to the pharmacopœia is too much contaminated with pectin and mucilaginous matter, and too weak in sugar to be permanent. The process is too tedious in its execution, and not always yields a clear syrup.

The proposed process consists in the employment of fluid extract of seneka and fluid extract of squill; but the production of the

latter by a practical and easy method, so as to completely represent the crude material volume for weight, yet remains a pharmaceutical enigma. Owing to the very gummy nature of squill, percolation with whatever strength of alcoholic menstruum cannot be successfully applied. But even if this fluid extract, otherwise carefully prepared, does not completely represent the total activity of the crude material, that cannot be claimed as a vital objection, in consequence of the natural variations in the activity of all crude medicinal substances of vegetable origin which constitute the basis of similar preparations.

Now, a very good fluid extract of squill, which will compare favorably with others made by more indirect methods, can be produced by repercolation of squill in the finest dusted powder, with stronger alcohol (95 per cent.), so that with squill of the proper fineness and alcohol of the requ site strength, an excellent product results, with the greatest ease, leaving a residue possossing very little bitterness, and which, in a practical point of view, can be fairly considered as exhausted.

This process has advantages far exceeding, in every point of utility, the one advocated by Mr. Diehl, whose process, for reason of his own results, were subjected to a most critical test.

Repeating his experiments with different samples of squill, and in quantities of upwards of eighty troy ounces, identical results were obtained, but eminently dissimilar to his, and vastly conflicting with his statements.

These differences may, however, be entirely attributed to the variety of squill he operated with; and granting that it must have been a very scarce variety, it does not seem strictly just that he should base his conclusions upon that one experiment alone.

The squill twice treated with water, as he directs, the liquid evaporated, and the light yellow syrupy residue mixed with abundance of stronger alcohol, produced a perfect white, doughy magma, equal to, at least, one-third of the original bulk of the squill, and which was, manifestly, impervious to alcohol, and, therefore, could not be washed with that solvent; consequently the absorbed liquid was a total loss, which could not act otherwise than deeply injurious to the strength of the final product. The liquid, separated from this immense doughy mass, was pale yellow, and nearly as mobile as alcohol itself, but possessed an exceedingly bitter taste. Mr. Diehl asserts that, in his experiment, the precipitate separated by the alcohol was brown, and very diminutive in its weight, being only 3 1-7 per cent. of the squill employed, and that the liquid separated from this precipitate by washing was syrupy, and very dark colored, which produced a milky vinegar of squill, but a clear syrup. These various results, with exception of that pertaining to the vinegar of squill, were, however, not corroborated by the repetition of that operator's experiments.

From the foregoing deductions we derive the following formula for compound syrup of squill:

Take of fluid extract of seneka,
" " " squill, of each four ounces.
Magnesium carbonate, one troy ounce.
Sugar, forty-two troy onnces.
Antimony and potassium tartrate, forty-eight grains.
Water a sufficiency.

Mix the fluid extracts, and evaporate the mixture by means of a sand or water bath to a syrupy consistence. Triturate this residue with the magnesium carbonate, and gradually add twenty fluid ounces of water, stirring constantly; filter, and pour sufficient water through the filter to make the liquid measure twenty-two fluid ounces. In this dissolve the antimonial tartrate and the sugar, with the aid of heat, and strain the syrup through muslin while hot. The result leaves nothing to be desired.

Of the numerous German officinal preparations that are in frequent demand with us, for reason of their importance in this respect and for the want of convenient and accurate processes, two of them will be noticed here, namely, the syrup of rhubarb of the Prussian pharmacopœia, and the aqueous tincture of rhubarb of the same. The officinal methods for these preparations are very unscientific indeed, and admit of improvement, which, without requiring any further commendations, is applied by converting, for this purpose, the fluid extract of rhubarb, above proposed, into an alkaline fluid extract of rhubarb, which is affected by triturating eighty grains of dipotassium carbonate with one fluid ounce of fluid extract of rhubarb, then straining through muslin at once, or after a repose of some hours. The strained liquid is perfectly clear, and does not require filtration through paper. The alkaline fluid extract of rhubarb can be mixed with water in any proportion, affording a perfectly clear and transparent liquid of a deep red color.

The following formulæ for syrup of rhubarb, and aqueous tincture rhubarb of the Prussian pharmacopœia, are in officinal proportions and yield a strictly officinal result:

SYRUP OF RHUBARB.

Take of alkaline fluid extract of rhubarb, three fluid ounces.
Oil of cinnamon, three minims.
Sugar, thirty-six troy ounces.
Water, sufficient.

Mix the oil of cinnamon with the fluid extract, then add sufficient water to make the whole mixture weigh twenty troy ounces; in this dissolve the sugar, with the aid of heat, and strain.

TINCTURE RHEI AQUOSA, OR AQUEOUS TINCTURE OF RHUBARB.

Take of alkaline fluid extract of rhubarb, one and a half fluid ounces.

Dipotassium carbonate, 240 grains.

Cinnamon water, four troy ounces.

Water, sufficient.

Dissolve the dipotassium carbonate in the cinnamon water; with this then mix the fluid extract, and add sufficient water to make the whole weigh fourteen troy ounces. Both the above formulæ thus produce permanent and beautiful preparations.

SAPONACEOUS PLANTS.*

BY P. L. SIMMONDS.

Many plants in different countries furnish useful substitutes for soap to the natives, where there are no conveniences or materials for manufacturing the ordinary soap of commerce. Prominent among these are the soapworts, tropical plants belonging to the genus *Sapindus*. The Hindoos use the the pulp of the fruit of *Sapindus detergens* for washing linen. Several of the species are used for the same purpose instead of soap, owing to the presence of the vegetable principle called saponine. The root and bark also of the same species are said to be saponaceous. The capsule of *Sapindus emarginatus* has a detergent quality when bruised, forming suds if agitated in hot water. The natives of India use this as a soap for washing the hair, silk, etc. The berries of *Sapindus Laurifolius*, another Indian species, are also saponaceous. The name of the genius *Sapindus* is merely altered from *Sapo-indicus*, Indian soap, the aril which surrounds the seed of *S. Saponaria* being used as soap in South America. According to Browne, the seed-vessels are very acrid; they lather freely in water, and will cleanse more linen than thirty times their weight of soap, but in time they corrode and burn the linen. This assertion, however, requires confirmation. Humboldt tells us that proceeding along the river Carenicuar, in the Gulf of Cariaco, he saw the native Indian women washing their linen with the fruit of this tree, there called the *Para para*. Saponaceous berries are also used in Java for washing. The fresh bark of the root *Monnina polystachia* (R. and P.), called *Yalhoi*, pounded and moulded into balls, is used by the Peruvians in place of soap.

Saponine exists in many other seeds and roots—in the legumes

*From the Journal of Applied Science.

of *Acacia concinna*, in which a considerable trade is carried on in some parts of India, and is the root or *Vaccaria vulgaris*, *Agrostemma Githago*, and *Anagallis arvensis*. It also occurs in various species of *Dianthus* and *Lychnis*, and in the bark of *Silene inflata*. *Gypsophila struthium* is used by the Spaniards for scouring instead of soap. The bruised leaves of *Saponaria officinalis*, a native of England, forms a lather which much resembles that of soap, and is similarly efficacious in removing grease spots. The bark of *Quillaia saponaria* of Central America answers the same purpose, and is used as a detergent by wool dyers. It has been even imported largely into France, Belgium, etc., and sold in the shops as a cheap substitute for soap. The fruit of the *Bromelia Pinguin* has also been found useful as a soap substitute.

A vegetable soap was prepared some years ago in Jamaica from the leaves of the American aloe (*Agave Americana*), which was found as detergent as Castile soap for washing linen, and had the superior quality of mixing and forming a lather with salt water as well as fresh. Dr. Robinson, the naturalist, thus describes the process he adopted in 1767, and for which he was awarded a grant by the House of Assembly of Jamaica: The lower leaves of the Curaca or Coratoe (*Agave Karatu*), were pressed between heavy rollers to express the juice, which, after being strained through a hair cloth, was merely inspissated by the action of the sun, or a slow fire, and cast into balls or cakes. The only precaution deemed necessary was to prevent the mixture of any unctuous materials, which destroyed the efficacy of the soap. Another vegetable soap which has been found excellent for washing silk, etc., may be thus obtained:—To one part of the cake add one and a half parts of the before-named *Agave Karatu*, macerated in one part of boiling water for twenty-four hours, and with the extract from this decoction mix 4 per cent of rosin.

In Peru, the leaves of the *Maguey Agave* are used instead of soap; the clothes are wetted, and then beaten with a leaf that has been crushed; a thick white froth is produced, and after rinsing the clothes are quite clean. The pulpy matter contained in the hard kernel of a tree, called locally *Del Jaboncillo*, is also used there for the same purpose. On being mixed with water, it produces a white froth. In Brazil, soap is made from the ashes of the bassena or broom plant (*Sida lanceolata*), which abounds with alkali. There are also some barks and pods of native plants used for soaps in China. The soap plant (*Amole*) of California, *Phalangium pomeridianum*, is stated by Mr. Edwin Bryant to be exceedingly useful. The bulbous root, which is the saponaceous portion, resembles the onion, but possesses the quality of cleansing linen equal to any olive soap manufactured.

From a paper read before the Boston Society of Natural History, it appears that this soap plant grows all over California. The

leaves make their appearance about the middle of November, or about six weeks after the rainy season has fairly set in ; the plants never grow more than a foot high, and the leaves and stalks drop entirely off in May though the bulbs remain in the ground all summer without decaying. It is used to wash with in all parts of the country, and by those who know its virtues it is preferred to the best of soap. The method of using it is merely to strip off the husk, dip the clothes into the water, and rub the bulb on them. It makes a thick lather, and smells not unlike brown soap.

At St. Nicholas, one of the Cape Verde Islands, they make a soap from the oil of the *Jatropha Curcas* seeds, and the ashes of the burnt papaw-tree leaf. The oil and ashes are mixed in an iron pot heated over a fire, and stirred until properly blended. When cool it is rolled up into balls about the size of a six-pound shot, looking much like our mottled soap, and producing a very good lather.

ON THE ACTION OF CHLORIDES ON CALOMEL.*

BY MICHAEL J. CUMMINGS.

(From the Author's Inaugural Essay.)

According to M. Mialhe, calomel is in part converted into bichloride (corrosive sublimate) and metallic mercury by muriate of ammonia, and by the chlorides of sodium and potassium. Doctor Gardner denies this assertion, and my experiments conform with this authority. Calomel is not converted into corrosive sublimate by the chlorides of the alkalifiable metals at the temperature of the body, but when raised to a temperature nearer the boiling point, it becomes in part slowly converted into corrosive sublimate. Having placed in a flask a mixture of twenty grains of muriate of ammonia, ten grains of calomel and an ounce of water, I set the flask in a water-bath heated to 70° F. and allowed it to stand at this temperature for three days. Finding no change had taken place, the calomel having remained undissolved in the bottom of the flask, I raised the temperature to 80° F.; the clear liquid was not precipitated or colored by lime water, ammonia, or sulphuretted hydrogen; the remaining calomel was placed in a filter, washed with distilled water, and the filtrate still gave no indications of corrosive sublimate. I again heated a mixture of muriate of ammonia calomel and water, at a temperature of 90° F., dropped into it twenty drops of muriatic acid, continued the heat for three hours, poured off a small quantity of the clear liquid and applied the tests without result. I then raised the

* From the American Journal of Pharmacy.

temperature to 119° F., and allowing it to remain at this temperature for four hours, found a slight trace of corrosive sublimate; the mixture was allowed to stand until cool and then filtered. The deposit in the filter was washed with distilled water, and to the filtrate an equal bulk of sulphuric ether was added, agitating the mixture briskly for fifteen minutes. The etherial solution was removed by means of a syphon, evaporated at a low temperature and a minute residue obtained which proved to be corrosive sublimate. Having found the precise point at which calomel will become converted into bi-chloride in the presence of chloride of ammonium, and being desirous of ascertaining the exact quantity, I heated a mixture of calomel muriate of ammonia and water in the quantities indicated above, continuing the heat at 110° F. for six hours, filtered, washed the filter with distilled water and allowed the filtrate to cool. It was agitated with an equal bulk of sulphuric ether, evaporated and left $\frac{7}{8}$ grain of corrosive sublimate.

When chloride of sodium is used in place of muriate of ammonia, the calomel does not so readily become converted into bi-chloride, but requires a higher temperature. At 110° F. no change takes place, but when kept at 120° F, for twelve hours, the calomel becomes very slowly converted into bi-chloride. The addition of twenty drops of muriatic acid to the quantity used, seems to hasten the reaction. Calomel digested alone with muriatic acid for (12) twelve hours, at a temperature of 120° F. undergoes the same change, but is not affected at a lower temperature. With nitro-muriatic acid the change takes place spontaneously and without any elevation of temperature; raising the temperature to 110° F. does not appear to hasten the reaction.

THE MEDICINAL PROPERTIES OF THE COCOA-NUT.*

BY JOHN R. JACKSON, A. L. S.,

Curator of the Museums, Royal Gardens, Kew.

The cocoa-nut (*Cocos nucifera*, L.) is a well-known economic plant, and is extensively cultivated in tropical countries. It is estimated that in Travancore alone there are ten millions of these trees growing. The fruits are a most important article of food in the countries where they grow, while the oil and the fibre of the husk—known as coir—are valuable articles in British commerce.

The cocoa-nut is not a recognized medicinal plant in European practice, though the oleine obtained by pressure from the crude oil refined, has been used as a substitute for cod-liver oil, experi-

*From the Pharmaceutical Journal, London.

ments having shown that its effect in increasing the weight of the body is almost equal to that of the latter, but that its continued use is apt to disturb the digestive organs and produce diarrhœa. The crude oil, as brought into England, is obtained by boiling and pressing the white kernel or albumen. While in a fresh state, and in a liquid form, this oil is of a pale yellow color, and almost without smell; it is much used in cookery by the natives, but becomes partially solid and turns rancid before it arrives in this country, where, for the purposes of the candle-maker, the stearine or solid fat is separated from the fluid. Cocoa-nut oil is said to be useful in strengthening the growth of the hair.

The milk of the cocoa-nut is more important to the natives in a medicinal point of view than the oil; in India they use it as a purifier of the blood, and we have heard from many an English resident in our eastern possessions, that it is not only an excellent medicine for the purpose, but that nothing can possibly be more refreshing to a thirsty traveller under a tropical sun than a good draught of fresh cocoa-nut milk. As we obtain it in this country, it has not only lost its freshness and fine flavor, but has also lost its medicinal properties. When quite fresh it has been employed successfully by English doctors in India in cases of debility and incipient phthisis, and it also forms an excellent substitute for, if indeed it is not preferable to, cow's milk for tea and coffee. In large doses, however, it is said to act as a purgative, and on this account has been recommeded in lieu of castor oil for those who cannot overcome the nausea arising from the latter. In the Fiji islands the milk is very extensively used, but it has been supposed, with how much truth we are not able to say, the continued use of it predisposes to the dropsical complaints which are said to prevail in those islands.

The toddy or wine which is obtained from the flower-spikes is described as being very refreshing and delicious; taken before sunrise; it is given by the native doctors in cases of consumption, and if taken regularly is said to be an excellent medicine for delicate persons suffering from habitual constipation.

THE THEORY OF DISINFECTANTS.*

BY. T. P. BLUNT, M.A., F.C.S.

The light has recently been thrown upon the nature of contagion and infection by the labours of Pasteur and others, the results of which have been ably summarized by the President of the British Association in his late inaugural address at Liverpool, seems to point

*Read before the annual meeting of the Shropshire Scientific Branch of the British Medical Association, and published in the British Medical Journal.

the way to clearer and more comprehensive views than those commonly entertained at present regarding the operation of the substances known as disinfectants.

These may be divided into two classes:—Those which, act by the oxidation and total destruction of the virus contained in infected matters, together with the foul gases which usually accompany it, and which are, in fact, nature's danger-signals of its presence. 2. Those substances which do not possess the active chemical properties of the first class, yet are proved by experience to have a similar power of arresting and checking the spread of infection. The latter are, for the most part, the more ancient and popular, having apparently in some cases been suggested by a just but unreasoning instinct. Thus we find that the use of sulphurous acid, as evolved from burning sulphur, dates even from Homeric days; while the burning of pitch and aromatic gums for disinfectant purposes has an origin at least equally remote.

An attempt will be made, in the course of the observations which follow, to bring the operation of the large majority of the latter class under a general law which shall furnish us with an explanation of their true character. This is especially desirable, since it is to be feared that, for want of such an explanation, many good and valuable disinfectants have been condemned by chemists on theoretical grounds, as mere deodorizers,—not assailing the virus of infected substances, but rather masking their poisonous character by precipitating their offensive gasses. An objection to this view at once meets us, in the utter disproportion between the volume of the gasses to be fixed and the quantity of salt practically found sufficient for the object required, while it breaks down altogether when applied to such disinfectants as the new "chlor-alum" or chloride of aluminum of Mr. John Gamgee, or the well-known carbolic acid. Before endeavouring to supply a more probable theory, it may be well to remind you that the researches already mentioned have established the fact that contagion and putrefaction, if not actually identical, are processes so closely allied that they require exactly similar conditions; the latter appearing to consist of a kind of disease propagated from particle to particle of a decomposing substance, and ending in its entire destruction. Hence it may be inferred with perfect safety, that any agent which arrests petrifaction is capable also of abolishing the proprieties of contagion and infection.

This conclusion at once puts into our hands a valuable instrument of research; for while it is difficult, and often impossible to investigate directly the disinfectant action of a substance, the inquiry being surrounded by innumerable sources of error, the properties of an antiseptic are perfectly well defined and open to the clearest demonstration. Thus, in the case of the two bodies mentioned above, carbolic acid and chloride of aluminium, the antiseptic action of the first is well known, and has long been usefully applied; while that

of the latter is maintained in the most positive manner by its introducer, Mr. John Gamgee, who certainly brings forward overwhelming proof of it in his recorded experiments upon meat and fish; and hence, on the grounds given, we are justified in regarding these substances as good and useful disinfectants. It may be stated, in passing, that the deodorizing power which these and other similar bodies possess is probably due to their antiseptic action; the offensive gasses of decomposition being sooner lost by diffusion, and their fresh production being entirely suspended.

Let us now proceed to a consideration of the origin of the remarkable proportion which we have described. This appears to have been traced with some degree of probability, in the case of carbolic acid, by Dr. Joseph Hirsch, the writer of an article which appeared in the *Chemical News* about the end of February, 1869. He advances the bold and ingenious speculation, that the disinfectant action of that substance depends upon its power of coagulating albumen. He supposes that the acid finds its way into the minute organisms, which propagate disease by diffusion through their investing membrane; that it coagulates the albumen which they, in common with all germinal matter, contain as a necessary constituent; and thus practically destroys their vitality as perfectly as immersion in boiling water terminates that of an egg.

In order to test the accuracy of the view thus enumerated, I selected a substance of which the albumen-coagulating power was well known, and examined it with regards to its antiseptic, and therefore, disinfectant properties. The substance chosen was nitro-muriatic acid, which has long been in use as a test for albumen in urine. The experiments were conducted as follows.

a. Two samples of fresh healthy urine, passed at the same time, each measuring about one ounce, were placed side by side. To one of them six drops of strong nitro-muriatic acid were added. In a few days, the unacidified specimen was covered with a thick crust of mould; while that to which the acid had been added was unaltered, except by a slight darkening colour and deposition of crystals of uric acid.

b. Some fresh meat was pounded into an emulsion with water, —the whole divided into two equal portions of about six drachms each. To one of them six drops of strong nitro-muriatic acid were added, as in the former case. In a day or two, the unacidified sample was quite putrid and offensive; while that to which the acid had been added, retained the smell of fresh meat, and continues to do so still, after the lapse of nearly a month.

I now proceed to test some of the salts commonly used as disinfectants, with respect to their possession of this power of coagulating albumen. The examination was conducted thus. One part of the salt to be tested was dissolved in one thousand parts of distilled water, and the solution was mixed thoroughly with the fresh

white of egg. The salts examined were iron-alum, susquichloride of iron, common alum, chloride of zinc and nitrate of lead. Coagulation followed immediately in every instance. In one or two cases the dilution was carried much further,—one part of the salt to three or four thousands of water. Here, too, coagulation followed in one or two seconds.

It may be remarked, in passing, that the hæmostatic action of the iron-salts is probably to be attributed in great measure to this faculty of coagulating albumen, exercised upon the serum of the blood.

The attempt to obtain similar results from the sulphites entirely failed. They appeared indeed, to retard coagulation by other reagents. The coagulating power of sulphurous acid was faint and ill defined.

If we review the evidence now before us, we shall find that it stands thus.

We start with two assumptions,—the first justified by recent research, the second borne out by analogy, viz., that infection results from the transference and development of minute germs; and that these germs contain albuminous matter as a necessary constituent, the coagulation of which terminates their existence, Upon these assumptions we frame our major premiss,—that "all coagulators of albumen are disinfectants;" and, having arrived at this result by a process of pure reasoning, we proceed to prove its truth by experiments upon the antiseptic, and so upon the disinfectant properties of a well-known albumen-coagulator. Having thus established our fundamental proposition, we produce experimental proof of our minor premiss—that "nearly all the substances to which popular experience has assigned the property of arresting the spread of infectious diseases, where that power is at present unexplained, are coagulators of albumen." The conclusion then necessarily follows, that these substances are disinfectants; and thus a vindication of their efficiency is furnished in those cases where it has been called in question by chemists on the ground that no sufficient explanation of their action had been offered.

The above conclusions does not apply to sulphurous acid and the sulphites. In their case, we must probably look for some more remote physiological effect upon germinal existence.

Note on the use of Hydrochloric Acid as an Antiseptic.

It is probable that hydrochloric acid, which shares the properties attributed to nitrohydrochloric acid in the foregoing remarks, will be found to be a valuable preservative of animal food. A piece of meat immersed for fifteen minutes in a mixture of one part of the acid to three of water, remained entirely free from putrefactive change after nearly a fortnight, though the action of the acid was not sufficiently powerful to prevent the appearance of a small quantity of mould. The meat was then immersed in a dilute solution of car-

bonate of soda, and the superficially absorbed acid was thus converted into common salt. This reaction obviously gives hydrochloric acid a great advantage over other antiseptics, which introduce into the food a foreign substance, inimical by its very nature, in most cases, to the process of digestion.

THE MODERN ASPECTS OF THERAPEUTICS.*

BY WALTER G. SMITH, M.D.

It must be allowed that the reproaches which have been so often levelled against the *practice* of medicine, have had much foundation in the past history of therapeutics, and all will re-echo Sir T. Watson's opinion, that "certainly, the greatest gap in the science of medicine is to be found in its final and supreme stage—the stage of therapeutics." Some of its keenest satirists have been physicians of the highest eminence and most varied acquirements, and, on the whole, it must be admitted, that the improvement of theraputics, contrary to the other arts and sciences, "bears no proportion to its antiquity." It is the consciousness of this disproportion which damps the spirits of so many in the profession, and which has led to so much distrust and doubt. Dr. Radcliffe used to say that "the whole art of physic, for which he had a profound contempt, might be written on one sheet of paper," and it is not so long since the late Sir W. Hamilton, of Edinburgh, asked the question:—"Has the *practice* of medicine made a single step since Hippocrates?" a revival of the older query, *an datur ars medicinæ?*

There are many evidences that the need for a more careful study of therapeutics is urgently felt by the body of the profession at large. In 1865, the physiological sub-section of the British Medical Association drew up a memorial to the General Medical Council praying the Council "by pecuniary grants and the appointment of suitable persons to undertake investigations into the physiological action of medicines." This memorial was supported in the council by the Regius Professors of Physic in the Universities of Dublin and Oxford, but was negatived on the ground of want of powers in the council to comply with the petition.

A sub-committee was then appointed by the British Medical Association, and the results of its labours are seen in the elaborate report brought out by Dr. Hughes Bennett, on the action of mercury, podophyllin, and taraxacum on the biliary secretion. About the same time the Royal Medical and Chirurgical Society intrusted the examination of the method of subcutaneous injection to a commit-

*Thesis for the degrees of M.D., 1870. Read before the Medical Society of the College of Physicians, March, 1871, and published in the British Medical Journal.

tee, and the valuable observations embodied in their report furnish the most satisfactory data which we possess respecting this method. Quite recently the Medical and Pyschological Association of Edinburgh have appointed a committee for the purpose of taking into consideration, among other things, the medical treatment of insanity, and they suggest propositions for combined therapeutical investigation, and ask for special information on the action of chloral. The Clinical Society of London owes its establishment in 1868, to the expressed want of more real knowledge on the various remedies in daily use, and the appearance of numerous detached papers, and of some works of merits on the doctrines and requirements of therapeutics testify to the deep-seated interest which now attaches to the prosecution of this subject.

I propose, now, briefly to inquire what are the resources at our command, and how far it may be said that therapeutics has advanced within the last quarter of a century, what are the hindrances to its progress, and, more particularly, in what direction we may hope for still further and more solid advances than have yet been gained.*

To avoid entering on too wide a field my observations will be chiefly confined to the domain of what may be called medicinal therapeutics, *i.e.*, of remedial agents as directly applied to the treatment of disease, and accordingly the steady progress and increased knowledge of sanitary science and preventive medicine, the splendid results of operative surgery, and the development of state medicine, will be passed over without comment.

The retrospect of the history of therapeutics for centuries past, is, in many respects, not encouraging, and one can scarcely help wishing that much, if not most, of what is called the accumulated experience of ages was swept clean out of remembrance, so overladen is it with confusion, mistatements and unproven theories. In fact since the prevailing ideas as to the action of drugs became in some degree fixed at a time when pathology was less exact than it is now, when there were no such accurate means of testing the real effects of remedies, and when physics and chemistry were in their infancy, we cannot avoid insisting on the necessity for renewed observations, carried out under better auspices, and with a better directed aim.

Yet it will be conceded that the materia medica abounds in agents by means of which very remarkable effects can be produced on the human frame, and a speculative mind might engage itself in showing that the possession of such power by various medicines is an argument in favour of our being intended to exercise a due control over the progress of disease. Even as it is, we can, at will, exalt or depress the action of the heart, the great fountain of life, and can, to some extent, control the capillary circulation; we can compel

*For many suggestions I am especially indebted to, and have largely made use of Sir W. Jenner's admirable address on medicine, delivered last year in Leeds, and Dr. Rogers' recent able work on therapeutics.

the stomach to eject its contents, and the intestines to discharge their excreta. We have agents that act on special functions of the encephalon, on the spinal cords, on the sensitive nerves, and purely on the motor nerves. By suitable means we can increase or diminish the exhalation from the skin and mucous membranes, and can alter in quality and quantity the secretion of many important glandular organs. At pleasure we can contract or dilate the pupil of the eye, can stimulate striped or unstriped muscles, can poison some internal parasites with certainty, and can aid in the elimination of metallic poisons from the body. And, let it be observed, not only have we these and other powerful means at our disposal, but that, in many, very many cases, we have the knowledge *how* to apply them to the treatment of disease with benefits which cannot be gainsaid, and in a few cases we know *why* we so apply them.

Our theories as to the nature of disease are undergoing a profound change, necessarily followed by corresponding modifications in the way in which we endeavour to meet or anticipate it. The notions of elimination and allopathy, of antidotes and of counter-irritation, have all their measure of truth, and are all usefully applied in practice, but it is to be hoped that none of them will ever again be raised to the rank of a system to cramp and fetter our ideas. As a positive and well-founded advance in the doctrines of therapeutics, it could easily be shown that certain injudicious or noxious lines of treatment have been abandoned, and that, in general, the habit of over-drugging has been given up. This beneficial change is due partly to a more accurate acquaintance with the local causes of disease, *e.g.* the parasitic skin diseases, partly to a more intimate knowledge of the pathology of disease, *e.g.* chronic pulmonary phthisis, and partly to a recognition of the principle that we are not to treat our patients as so many sponges doomed to soak up the maximum quantity of medicine possible, but, as living beings, whose functions are disordered by disease, and whom we seek to restore to health by aiding the natural tendency to recover, and by striving to modify the direction of action of the natural forces of the body. We know now that a large number of acute diseases occurring in previously healthy persons naturally run a definite course and tend to spontaneous recovery, in the absence of or even in spite of misdirected drugging, and we have recognized that certain acute diseases supposed to be of indefinite duration lie within appointed limits. We, therefore, by this advance in knowledge, avoid drawing false conclusions as to the efficacy of drugs in particular maladies, and although we do not pretend to be able to strangle acute disease by specifics, or suddenly arrest the cycle of morbid action, much still remains for our art in meeting special symptoms and controlling intercurrent complications. Sometimes advances in knowledge teach us a more correct appreciation of the composition and mode of action of drugs, or at least displace a

faulty explanation. This certainly is a gain, and we know too little yet to see how far the application of the physical processes, dialysis, diffusion, and osmosis may before long enlighten some of the dark recesses of therapeutics.

Among the tributes levied from chemistry and natural history, we can reckon carbolic acid and its compounds, the alkaloids, the bromides, permanganate of potassium, sulphurous acid, and the sulphites, the whole group of anæsthetics, chloroform, ether, bichloride of methylene, nitrous oxide, and nitrite of amyl, Calabar bean, glycerin, pepsin, santonin, podophyllum, and lastly chloral, and its allies bromal and iodal. The mention of the class of alkaloids suggests the thought that very great benefit would, doubtless, accrue from the more extended use of the alkaloids in the room of the crude vegetable products from which these are derived. Our therapeutical experience would be rendered infinitely more accurate by the employment of these definite active principles which are chemically stable, and whose dosage can be exactly proportioned, and the differences which are often asserted to exist between the active principle and the crude drug itself would doubtless be found to be much less considerable than is generally thought. In the case of belladonna and conium, for example, the efficacy of these drugs is fairly and fully represented by their respective alkaloids, and even in the case of a complex substance like opium which contains several organic basis of different properties, it would be quite possible, after proper investigations to combine these basis in a compound solution so as to represent perfectly the action of the crude opium. As illustration of the confirmation and extension of the curative powers of single drugs we can adduce the mass of evidence that now exists as to the respective value of mercury and iodide of potassium in different stages of syphilis, and of mercury especially in infantile syphilis, of the utility of arsenic in the *relapsing* skin diseases, of bromide of potassium in epilepsy, and certain other abnormal conditions of the brain and sexual organs, of quinine in periodic diseases other than ague, and of ipecacuanha in dysentery. We are better acquainted with the action of digitalis, opium, belladonna, hyoscyamus, and conium, and there is a clearer understanding gaining ground as to the worth and indications for the employment of alcohol in the treatment of disease.

The uses of iodide of potassium have been brought into greater prominence, and have been more sharply defined, and amongst the results "we may boast the disappearance of radesyge in Norway, of yaws in our West Indian colonies, and of most of the severe forms of tertiary syphilis at home." Since the more important of these drugs are of quite recent introduction, they are to be looked on as but an earnest of the harvest we are yet to reap from the domain of the natural sciences. Improved modes of administration are only second in importance, and hypodermic injection is an aid for which

we cannot be too grateful, triumphing especially in the relief of painful and spasmodic affections. Lastly, a discrimination between the properties and uses of the direct and induced currents, *i.e.* of galvanization and faradization, has led to most important and gratifying results in the treatment of such formidable diseases as epileptiform neuralgia, infantile paralysis, and progressive muscular atrophy. It is proved that it is possible and feasible to galvanize directly the brain and spinal cord, and the galvanic irritation of the sympathetic nerve may yet furnish us with a powerful lever for controlling the nutrition of even remote parts.

Many circumstances have contributed to clog the progress of therapeuties, some of which belong to the inherent difficulties of its investigations, while others, and that a large portion, are due to the ignorance and incompetence of those to whom we should look for aid. The fallacies connected with the application of the inductive method of reasoning to the science of medicine, and the sources of error in practical and theoretical medicine, have been well exposed by Sir G. Blanc and by Dr. Barclay, and I would merely remark that the principles enunciated by these authors, while they are the philosophical basis of the practice of physic, constitute the best answer to morbid scepticism on the one hand, and vulgar credulity on the other.

Faulty modes of preparation, and the use of entirely worthless compounds, are fruitful sources of error, and we can point in illustration to the investigations of Dr. Harley on the Galenical preparations of conium, in which he proves the absolute valuelessness of the extractum conii. Again, the assemblage of a number of active drugs in a prescription, often introduced at random, is destructive to a right appreciation of the effects of medicines; and, as a rule, the principle of combination should not be extensively tried till we are in a better position to estimate justly the influence of certain drugs on special diseases.

(To be continued.)

Editorial.

THE OLD TIME AND THE NEW.

A very different man from our modern pharmacist was the apothecary of the olden time. Deep in the lore of the alchymists, surrounded by his books and the emblems of his calling, he was regarded by the people of a superstitious age with a feeling akin to awe. Sorcery, witchcraft, and all that is mysterious, were centered in him. His path was not that of ordinary mortals; his chief companions were the stars, with whom he held nightly communion; or if we credit the story of the immortal Faust, it may be that his associates were even more select. With artists who devote themselves to the ornamentation of those useless but indispensible vessels, which, with questionable propriety we term "specie" jars, the ancient apothecary is always a favorite object for delineation. Cloaked from head to foot, he sits in his laboratory, amid a pile of ponderous books,—a venerable but severe man. On one knee rests the inevitable bellows with which he urges the fire in the furnace before him, while on the other is placed a book—perhaps a pharmacopœia of the period—so that reference may be made at any time; or as our authorities have it "that the officinal directions be closely observed." Close at hand stands a pestle and mortar, while on the fire is placed a retort with an exceedingly wry neck, in whose operation the interest of our apothecary appears to centre. What may be in that retort it is impossible for us to say,—perhaps the materials for the great *alcahest*, or the universal elixir, or, it may be, but a simple water,—at all events it is evident that our apothecary is a chemist as well as a druggist. He must, by no means, be classed with those referred to by Basil Valentine in his *Triumphant Chariot of Antimony*, of whom it is said, "Labor is tedious to them, they have no conscience, and coals are outlandish wares with them: of their medicines they only know as written in their books, and seek after nothing but money."

Times have changed since the days of the ancient apothecary. To lessen labor by a wider distribution of its offices is now the universal rule, and to this pharmacy has not proved an exception. The furnace and still, with all their appurtenances, have been turned over bodily to the manufacturing chemist, The old mortar, in which the "rudiments" were elaborated, no more resounds to the sound of the pestle, but, clothed in gilt, stands idly on a pedestal before the druggist's door, as if to intimate that all powdering is done outside the establishment. Even the bellows have changed hands—the printers now do all the puffing. It is well that the old monk of the *Currus Triumphalis* sleeps soundly or he would surely read us a homily.

Though giving all deference to that principle on which the division of labor is founded, we cannot help seeing, that, like everything else, it may be carried too far in practice. There may be a time when a knowledge of the nature of medicines, and the art of compounding them, may be the business of one, while their disposal and sale is vested in another. That time is not yet; the pharmacist of to-day is supposed to embody in himself all these offices—while a professor of pharmacy he is a vendor of drugs. Let then the furnace be reinstated—the still again set to work—nor let the mortar be longer a sign of reproach.

In order to give a practical turn to this rambling and discursive article, we may as well revert to that which we had intended to lay before our readers, when the old apothecary and his retort presented itself to our mind. We know that we are putting the cart before the horse, but hope our readers will, for this time, pardon our giving the moral the precedency of the story.

In the *American Journal of Pharmacy*, for July, is a paper by Mr. Maisch, the editor, in which attention is called to some experiments made on solutions of alkaloids in medicated waters, by a late student of the Philadelphia college. A prescription had been dispensed in which sulphate of morphia was dissolved in peppermint water; the latter had been made by that labor saving method—the trituration of the essential oil with carbonate of magnesia and water. When the vial which had contained the medicine was sent back to be refilled, it was observed that the sides were covered with crystals, which were collected and proved to be morphia. Remarking on this Mr. Maisch says:

The process of the Pharmacopœia alluded to, yields, in all cases, a medicated water possessing an alkaline reaction, which is shown by its effect upon a diluted tincture of turmeric, the latter turning reddish brown. If chloride of ammonium and ammonia water are added to such a medicated water, any soluble phosphate will in a short time produce a dense cloudiness and finally a precipitate. It is unnecessary to enter into the causes of the solubility of magnesia under these circumstances; the fact is a plain one, and the possibility of dangerous effects very obvious. Neutral salts of insoluble (in water) alkaloids may be dissolved in such medicated waters, but the alkaloids will be gradually precipitated in a form in which they cannot be uniformly diffused in the liquid even by agitation; hence the possibility, if the separated alkaloid does not firmly adhere to the vial, that the last dose may contain an excessive amount of a poisonous article; while, in case it should adhere with sufficient firmness, the result might be, at least, disappointment in the effects, if nothing worse, in consequence of insufficient medication.

Heretofore we have advocated the preparation of medicated waters by distillation from the drugs, solely for the reason of their superior flavor and taste. The facts pointed out above furnish a by far stronger argument.

Although the British *Pharmacopœia* orders its medicated waters to be made by distillation, we believe that nearly all such preparations are made in Canada by the U. S. *Pharmacopœia* process, to which reference is made above. We can only urge a discontinuance of the practice, and are glad to find that there can be found a sufficiently strong reason to insure this, and thus drive out these pseudo-distilled waters, which are, at best, but loathsome imitations of the *aquæ medicatæ* of the old apothecary.

PHARMACY IN NEW YORK.

Our readers have been apprised of the recent law, in regard to the practice of pharmacy, in New York. We learn from the *American Journal of Pharmacy* that the Commissioners appointed by the Mayor have given notice that the examination of druggists, and their clerks, will take place on the Tuesdays and Thursdays of each week, between the hours of 10 a.m., and 3 p.m. It will be remembered that all those engaged in business will be subjected to examination—the druggists first, and afterwards, their assistants. The subjects proposed are chemistry, practical pharmacy, officinal

botany, materia medica, prescriptions, poisons and their antidotes, and the adulteration of drugs. The fees are: for druggists' and drug clerks', $30; prescription clerks', $10. It is estimated that the amount realized by the first registration will reach the sum of $23,000. This of course includes the fees from city druggists only, as the act does not apply to the state. Our contemporary lacks information as to the distinction between "drug clerks" and "prescription clerks. Perhaps the commissioners will be able to determine, but, considering the difference in the fees, it may be reasonably supposed that most of the clerks will have a particular leaning towards prescriptions.

Since noting the above, we have heard that the examinations are being carried on with vigor, an average of twenty-one pharmacists are examined daily, about one-third of whom are rejected. An opportunity is given to the latter class to read up and try again. Our New York friends are certainly legislating with a vengeance, and Canadian druggists have reason to be thankful that they live under the benign shadow of the Ontario College of Pharmacy.

The nineteenth annual meeting of the American Pharmaceutical Association is announced to take place at St. Louis, on the second Tuesday of the present month. We are pleased to learn that Mr. W. Saunders, of London, will act as delegate from the Ontario College of Pharmacy. We consider this appointment a most happy one, as Mr. Saunders has been connected with the body which he represents from its commencement, and at the same time has been an active working member of the American Association. Mr. S. has kindly consented to furnish an account of the proceedings of the conference for this Journal. We trust that the meeting will be, in all respects, as successful and pleasant as those of years gone bye, and hope that at no very distant period we may be in a position to extend an invitation to our American friends to hold an international gathering in our own city.

In another part of this journal will be found an interesting communication from the esteemed president of the College, in which he is pleased to speak in the most flattering terms of the appearance

of our new series. Many communications of a like tenor have been received ; one of which—the letter of one of the founders of the late society—will be found following that of the president.

In regard to the latter portion of the president's letter in which he expresses his regret at the publication of an article which appeared in our last issue, we can only say that we are exceedingly sorry to have offended, and more especially to have offended one whose very reproaches are kind. The case was, however, a peculiar one—if we had maintained silence, we would have laid ourselves open to the charges of connivance or cowardice. As these are qualities with which we hope to have nothing to do, and as our convictions of right, as well as the interests of the trade of which this Journal is the organ, demanded the expression of an opinion, we penned our criticisons, which, considering the aggravation of the case, were couched in language of the utmost courtesy. We have expressed our sorrow at this unanticipated result and can now do nothing more.

Our attention has heen called to the official report of the last meeting of the late Pharmaceutical Society, in which it is stated that an appropriation of fifty dollars was made to each of the gentlemen who acted as auditors; and in the statement of the liabilities of the society, as assumed by the new College, the item of one hundred dollars is so charged. It is not, however, mentioned that at the time the appropriation was made, one of the auditors—Mr. J. T. Shapter—declined accepting any remuneration for his services, saying that he was only too happy to be of the slightest use to the society, and regretting that he had been prevented, by continued sickness, from taking as active a part in its proceedings as he desired.

Editorial Summary.

Chloral and Cod-Liver Oil.—The addition of chloral to cod-liver oil, as rendering the taste less nauseous, and for the prevention of night-sweats, and inducing sleep, is recommended by an European contemporary. Ten grains of the crystallized hydrate may be dissolved in twenty times its weight of the oil.

SUPPOSED INCOMPATIBILITY OF NITROUS ETHER AND CARBOLIC ACID.—A Mobile correspondent of the American *Druggist's Circular* prepared a mixture according to the following prescription:

℞ Potas chlor. ʒ j.
Acid carbol. gtt. xij.
Spts. nitre dulc.
Syr simpl. *a a* ʒ ss.
Aqua q. s. *adde* ʒ vj.

Calvert's acid was employed, and the spirits of nitre was of the dispenser's own manufacture. The mixture was, after a few hours, returned, as it had assumed a deep brownish-black color, and was condemned by the prescriber. The mixture was repeated with various samples of spirits of nitre, but with the same result. The editor of the *Druggist's Circular* attributes the change in color to the production of picric acid, from the action of free nitric acid in the spirits of nitre, but thinks that a pure article would remain unaffected, and the two substances cannot therefore be considered incompatible. It is, however, very difficult to procure a sample of nitrous ether quite free from acid, and, when procured, is equally difficult to keep in a state of purity, so that, for practical purposes, the mixture had better be avoided.

COAR TAR BENZOLE AND PETROLEUM NAPHTHA.—The solubility of pitch in benzole is recommended by Brandberg as an easy means of distinguishing between these two products; a small piece of pitch is placed in a test tube, and covered with the liquid to be examined; in coal tar benzole it is readily dissolved, while petroleum benzole merely shows a trace of color, even after contact for several hours.

PHOSPHORUS PILLS.—A writer in the *Pharmaceutical Journal* of London, recommends the following form for the administration of phosphorus: phosphorus, six grains; suet, six hundred grains. Melt the suet in a stoppered bottle capable of holding twice the quantity indicated; put in the phosphorus, and, when liquified, agitate the mixture until it becomes solid; roll into three grain pills, and cover with gelatine. Each pill one thirty-third part of a grain of the active ingredient.

GLYCERINE AS AN EXCIPIENT FOR CASTOR OIL.—It is stated by a correspondent of the Boston *Medical and Surgical Journal*, that by employing the following formula a mixture is produced in which the disagreeable taste of the oil is completely disguised:

Glycerine
Ol. Ricini *a a* ʒ ij
Ol. Cinnam. m iv

The essential oil should be rubbed up with the glycerine; the castor oil added, and the mixture well shaken before using.

THERAPEUTIC ACTION OF CHLORAL.—In a paper on this subject, in the *Michigan University Journal*, Dr. S. G. Armor arrives at the following conclusions:—

1. Although a valuable sedative in cases of morbid wakefulness and general irritative action of the nervous system, it cannot always be relied on as a substitute for many of the old and well-tried anodynes and nervines of the *Materia Medica*

2. In a certain proportion of cases it produces unpleasant symptoms, such as gastric distress, difficult breathing, partial paralysis of the organs of deglutition, great restlessness, and sometimes coma. These are largely exceptional, however, to its general action.

3. These unpleasant symptoms are, in many cases, obviated by administering an opiate in small sustaining doses to the nervous system before administering the chloral—say one twelfth of a grain of morphine, or its equivalent of some other preparation of opium. The action of small stimulating doses of opium, administered twenty or thirty minutes before the chloral, appears to be antagonistic to its sometimes depressing effects.

4. The action of chloral is somewhat peculiar on the brain; it intensifies the action of alcohol by adding to its intoxicating properties. Great care should be exercised, therefore, in administering both agents at the same time, and in administering chloral with chloroform or ether.

5. It also intensifies the action of the so-called "*delirients*" of Headland, namely, belladonna, hyoscyamus and stramonium. Full doses of neither of these articles should be administered with full doses of chloral.

6. It is very sensitive to certain chemical re-agents, especially those of organic origin. It should not, therefore, be allowed to stand long dissolved in syrups; nor should it be combined in any mixture containing organic matter. It should be dissolved in simple water, and, like all salines which act by absorption, should be well diluted either before or after taking.

7. It should never be administered on a full stomach, neither an empty one; intermediate periods are better. A good rule is, to select a period when the stomach is empty, and have the patient take a small crust of bread, or a cracker, ten or twelve minutes before taking the chloral.

8. Its action is somewhat transient. In two or three hours the dose must be repeated if the first produces no effect, or if we desire to protract the action of the drug. In urgent cases two or three doses can be administered at shorter intervals.

9. The dose varies in proportion to the amount of irritability, or morbid wakefulness. Eight or ten grains, repeated every hour, or a larger amount every two hours, until twenty or thirty grains are taken, is usually sufficient to secure the specific action of the drug; although in severe cases much larger doses may be administered with

safety. In a severe case of delirium, occurring during the progress of a continued fever, in which all the usual resources for securing sleep had failed, I advised that the patient take a drachm of the chloral at one dose. It had no other effect than that of producing quiet and refreshing sleep. The patient had taken several twenty-grain doses without any effect. These large doses, however, are not advisable, and should never be resorted to except in desperate cases, when other means and smaller doses had failed.

10. The protracted use of the drug is not advisable. It should be prohibited. It weakens the general vital forces, destroys the healthy tone of the nervous system, and tends to the production of anæmia.

Correspondence.

REMARKS ON THE FIRST NUMBER OF THE NEW SERIES OF THE "JOURNAL," BY THE PRESIDENT OF THE ONTARIO COLLEGE OF PHARMACY.

MR. EDITOR:—Permit me to congratulate you and the "Ontario College of Pharmacy," on the improved and very respectable appearance of the first number of the new series of the "Canadian Pharmaceutical Journal."

The shape and the size are just the thing; the typography and general arrangement are unexceptionable. There is a fair sprinkling of advertisements to begin with, and I hope to see them very largely increased, and doubt not that with proper business energy such will be the case.

To refer to the interior more particularly, I feel convinced the great bulk of the matter will be of great interest to the intelligent class of readers you will have to peruse it.

The "Transactions of the College" is a portion that will receive particular attention, recording as it does the winding up of the proceedings of the preliminary organization—the "Canadian Pharmaceutical Society," and its merging into the "Ontario College of Pharmacy." The members of the former, especially some of those residing in the city, performed much labor, gratuitously, and had many a struggle, and suffered great and numerous disappointments before they were crowned with victory in getting the latter established by "Act of Parliament." The "article" I am now referring to gives your readers a concise and well digested account of the proceedings of the Provisional Council named in the Act to get the new law into operation. And I have reason to know that no body

of men, met together for business, worked harder, more in harmony and more disinterestedly, to set the new College fairly agoing. But these matters, in a condensed form, are placed fairly before your readers, and they can and will judge for themselves.

The article "on some medicinal plants of Canadian growth" is worthy the intelligent source whence it comes. And it is ardently to be desired that many more similarly situated with the writer, both in the means of recreation he adopted, and in the written description of those means, may go and do likewise.

Of the many other instructive and scientific articles in this first number, I have not time to speak, further than to say they are well calculated to promote the educational object of the "JOURNAL."

Before concluding these hastily written remarks, I am constrained to offer a comment or two on the first article under "Books and pamphlets."

I very much regret that article was written, because in the first place the criticism is too severe, considering the work was done gratuitously, and owing to hindrances the committee could not control, it had necessarily to be done hurriedly, in order to be ready in time to meet the requirements of the law. Those who work for the general good without expecting payment should always be treated with consideration and courtesy, even though their work may have some defects.

While I feel inclined to defer my judgment to one who is in the habit of reviewing new publications, yet I think that with the exception of one, there is no mistake in the book in question that would mislead any intelligent boy of fourteen, and the exception is one tending to the side of safety.

I think too, that as the Poison Book is, in some measure a commercial enterprise entered into by the College, for the benefit, incidentally of its funds, it was not prudent in one acting in behalf of the same institution to condemn it so strongly, or even at all, especially when it is considered the mistakes, which are merely orthographical ones of the printer, are corrected.

I would fain hope that as all the transactions between the members of the associations have been conducted hitherto in a gentlemanly and honorable manner, they may be continued so to the end.

Toronto, August 29th, 1871. W. E.

Editor Pharmaceutical Journal.

Allow me to offer my congratulations on the improved appearance presented by the first number of the new series of the Journal. The change was much needed as the old style was neither of good shape or size for binding. There is one department, however, which

I am sorry to see you have discontinued—I refer to the Students' Column. I consider it of great value to our young members, and would suggest that it be recommenced. If the Council do not think proper to grant a sum of money for prizes, a sufficient amount might no doubt be easily obtained from individual members of the society.

I was glad to see the action you took with regard to the poison books; your criticisms are both straight forward and just, and represent the general feeling of druggists throughout the country. One of the Council might well characterize the first page as a mixture of Latin and English quite unworthy to be issued by an educational institution. If allowed to have gone uncorrected it would have been a disgrace not only to the College but all its members,

Wishing you every success,

I beg to subscribe myself

ONE OF THE FOUNDERS OF THE SOCIETY.

Transactions of the College.

MINUTES OF MEETING OF PRINTING COMMITTEE.

ONTARIO COLLEGE OF PHARMACY.

Present—Mr. R. W. Elliot in the chair; Messrs. J. L. Howarth, Registrar, Neil C. Love, J. T. Shapter, W. H. Dunspaugh.

The Secretary read resolution of the Pharmaceutical Society, May 1869, appointing the Committee, also resolutions of the Council in regard to the publication of the Journal.

The Chairman remarked that it would be seen from the resolutions read that the Printing Committee are responsible for the financial condition of the Journal, and also responsible with the Editor for its literary contents, it will therefore be their duty to take such steps as to secure the proper keeping of the accounts, &c., of the Journal, and to adopt such action as may be deemed advisable, in regard to articles appearing in its pages.

After discussion it was resolved,—

That all monies received on account of the Journal, be paid into the hands of the Treasurer of the Council, and that all contracts and expenditures connected with the Journal shall be subject to the approval and warrant of a sub-committee, consisting of Messrs. Shapter and Hodgett and the Registrar, two to form a quorum.

It was further resolved—That in order to preserve harmony in the operations of the College all editorial matter touching the proceedings of the Council, or the work of any of its committees, shall be approved before publication, by three members of a sub-committee consisting of Messrs. W. H. Dunspaugh, W. Saunders, N. C. Love, R. W. Elliot and J. L. Howarth.

The Secretary was instructed to have these proceedings inserted in the next number of the Journal.

HENRY J. ROSE,
Secretary.

Practical Formulæ.

Violet Sachet Powder.

Take Black currant leaves	1	pound.
Cassia flower-heads	1	"
Rose leaves	1	"
Orris root powder	2	pounds.
Oil of almonds	½	drachm.
Grain musk	1	drachm.
Gum benzoin, in powder	½	pound.

Mix the ingredients well by sifting; keep them in a glass or porcelain jar for a week before offering for sale.—*Druggists' Circular.*

Millefleur Sachet Powder.

Take Lavender flowers, ground	1	pound.
Orris root	1	"
Rose leaves	1	"
Benzoin	1	"
Tonquin beans	¼	"
Vanilla	¼	"
Sandal wood	¼	"
Musk	2	drachms.
Civet	2	"
Cloves ground	¼	pound.
Cinnamon	2	ounces.
Allspice	2	"

—*Ibid.*

LIME JUICE AND GLYCERINE.—Most preparations bearing the above name are merely emulsions of almond or olive oil, with lime water or saccharated solution of lime, variously perfumed, and with or without the addition of glycerine.

R White Wax ʒ ss
Oil of Sweet Almonds ʒ viij.

Incorporate by heat of a water-bath, and add gradually S. A.

Glycerine ʒ j
Lime or Lemon Juice, or
Citric Acid gr. xxxiij
Water ʒ j } ʒ j
Rectified Spirit of Wine ʒ ss
Water ʒ ij
Ess. Lemons ʒ ij
Essential Oil of Almonds gtt. v.

R Ol. Amygdalæ ʒ iss
Ol. Ricini ʒ ij
Liq. Calcis ʒ iiss
Otto Rosæ q. s.
Shake well.

R Ceræ Alb.,
Cetacei, ana ʒ ij
Ol. Amygd. ʒ viij
Succ. Limettæ ʒ vj
Glycer. Boracis ʒ ij
Ess. Lemon ʒ ss
Ess. Bergam. ʒ ij

Melt the wax and spermaceti, add the oil and perfume, then shake till cold with the lime juice and glycerine previously warmed.—*London Pharmaceutical Journal.*

In the same Journal we have a formula for the article made with lime water, and which will represent more correctly what is known commercially, as "Lime Juice and Glycerine,"

R Ol. Amygdalæ ..... ʒ ij.
Ol. Lemon ..... ʒ ij.
Pot. Carb ..... ʒ ij.
Glycerine ..... ʒ j.
Aq. Calcis ..... ʒ xij. M.

R. Ol. Amygdalæ, dulc..... ʒ iiiss.
Liq. Calcis..... ʒ iiss.
Ess. Bergamot ..... gtt. xx.
Otto Rosæ ..... gtt. iij. M.

ARTIFICIAL PRODUCTION OF CONINE.—It is said that Socrates terminated his life by drinking conine, extracted from the poisonous hemlock, *Conium maculatum*. The oily liquid is highly poisonous, and closely resembles the nicotin obtained from tobacco. The artificial preparation of this body has more than ordinary interest, as it suggests the possibility of our being able to make other alkaloids, such as quinine, morphine, and the like; and if we can succeed in this, why not prepare the less complex compounds, sugar, starch, etc? The conine was prepared by Hugo Schiff, by heating alcohol and ammonia at 210°, together with butyraldehyd, precipitating with a platinum salt, and distilling the product. The artificial alkaloid exhibits the same products as the native. It is a violent poison, and in other respects is analogous to the extract from hemlock. As the first step in the synthesis of vegetable alkaloids, the discovery of Professor Schiff is one of the most important in chemistry.—*Phila. Med. and Surg. Reporter.*

MARKET REPORT.

There has been a fair amount of business done during the past month, and there is every indication of its continuance. Changes in price are not very numerous; a few articles are lower than our last quotations, amongst which may be noted the salts of morphia, which have fallen very considerably. The extracts of Belladonna and Henbane, are somewhat easier, as also English oil of peppermint. The season for White Hellebore is, of course, over, and, as a consequence, the price has receded; the powder is quoted at 17 to 20 cents.

Owing to the demand for iodine exceeding the supply, the price of that article, as well as all the iodides, is very much higher, and still advancing. Resublimed is now quoted at 7.75, and iodides of potassium at 6.50 to 7.00. Balsam Peru, and oil of Lemon have advanced. Potash bichromate is rated higher. Senega root is quoted at 1.35, and likely to advance, as all the stock in New York is in the hands of one firm, who have held it at 2.00. Carbonate of soda is very firm, and relatively higher at place of production than here.

Dyestuffs are in good demand; Japonica is held at an advance.

Spices are quiet—Nutmegs and Mace being much firmer.

In Dry Paints, Vermillon is a little easier—English being quoted at 1.15 to 1.25. Whiting has advanced from 80 to 85 cents.

In Naval Stores we note spirits of Turpentine, which has lately been very unsettled, is now a little lower, rating at 65 to 70 cents. Black pitch has advanced considerably.

DRUGS, MEDICINES, &c.	$ c.	$ c.
Acid, Acetic, fort	0 12 @	0 14
" Benzoic, pure	0 25	0 35
" Citric	0 86	0 90
" Muriatic	0 04	0 06
" Nitric	0 11½	0 15
" Oxalic	0 24	0 30
" Sulphuric	0 03¾	0 07
" Tartaric, pulv	0 40	0 42
Ammon, carb. casks	0 19	0 20
" " jars	0 19	0 20
" Liquor, 880	0 18	0 25
" Muriate	0 12½	0 15
" Nitrate	0 45	0 60
Æther, Acetic	0 45	0 50
" Nitrous	0 27	0 30
" Sulphuric	0 45	0 50
Antim. Crude, pulv	0 13	0 17
" Tart "	0 50	0 55
Alcohol, 95 per ct.....Cash	1 62	1 72
Arrowroot, Jamaica	0 19	0 22
" Bermuda	0 45	0 65
Alum	0 02½	0 03½
Balsam, Canada	0 24	0 35
" Copaiba	0 68	0 75
" Peru	4 00	4 20
" Tolu	1 00	1 20
Bark, Bayberry, pulv	0 18	0 20
" Canella	0 17	0 20
" Peruvian, yel. pulv	0 45	0 50
" " red "	1 40	1 80
" Slippery Elm, g. b	0 15	0 20
" " flour, packets	0 28	0 32
" Sassafras	0 12	0 15
Berries, Cubebs, ground	0 20	0 25
" Juniper	0 06	0 10
Beans, Tonquin	0 60	1 10
" Vanilla	16 00	17 00
Bismuth, Alb	4 60	5 00
" Carb.	4 60	5 00
Camphor, Crude	0 33	0 35
" Refined	0 45	0 55
Cantharides	1 90	2 00
" Powdered	2 10	2 25
Charcoal, Animal	0 04	0 06
" Wood, powdered	0 10	0 15
Chiretta	0 25	0 30
Chloroform	1 00	1 50
Cochineal, S. G.	0 80	0 90
" Black	1 00	1 20
Colocynth, pulv.	0 50	0 60
Collodion	0 67	0 70
Elaterium .....oz	4 50	5 00
Ergot	0 65	0 75
Extract Belladonna	2 20	2 50
" Colocynth, Co	1 25	1 75
" Gentian	0 50	0 60
" Hemlock, Ang	1 12	1 25
" Henbane, "	1 70	2 00
" Jalap	5 00	5 50
" Mandrake	1 75	2 00
" Nux Vomic	0 60	0 70
" Opium	Variable.	
" Rhubarb	7 50	—
" Sarsap. Hon. Co	1 00	1 20
" " Jam. Co	3 25	3 70
Flowers, Arnica	0 70	0 80
" Chamomile	0 25	0 35
Gum, Aloes, Barb. extra	0 30	0 40
" " good	0 70	0 80
" " Cape	0 42	0 50
" " powdered	0 12	0 20
" " Socot	0 20	0 30
" " pulv	0 76	0 80
" Arabic, White	0 90	1 00
" " powdered	0 60	0 65
" " sorts	0 50	0 55
" " powdered	0 28	0 30
" " com. Gedda	0 42	0 50
" Assafœtida	0 13	0 16
" British or Dextrine	0 31	0 35
" Benzoin	0 13	0 15
" Catechu	0 48	0 55
" " powdered	0 12	0 15
" Euphorb, pulv	0 25	0 30
" Gamboge	0 32	0 40
" Guaiacum	1 05	1 20
" Myrrh	0 38	0 87
	0 48	0 60

DRUGS, MEDICINES, &c.—*Contd.*	$ c.	$ c.
" Sang Dracon	0 60	0 70
" Scammony, powdered	5 60	—
" " Virg. "	14 50	—
" Shellac, Orange	0 43	0 45
Gum, Shellac, liver	0 38	0 40
" Storax	0 65	0 75
" Tragacanth, flake	1 10	1 40
" " common	0 35	0 40
Galls	0 27	0 32
Gelatine, Cox's 6d	1 10	1 20
Glycerine, common	0 25	0 30
" Vienna	0 30	0 40
" Prices	0 60	e 75
" Honey, Canada, best	0 17	0 20
" Lower Canada	0 15	0 18
Iron, Carb. Precip	0 20	0 25
" " Sacchar	0 40	0 55
" Citrate Ammon	1 10	1 20
" " & Quinine, oz	0 52	0 60
" " & Strychine "	0 17	0 25
" Sulphate, pure	0 08	0 10
Iodine, good	7 00	—
" Resublimed	7 75	—
Jalapin	1 40	1 60
Kreosote	1 60	1 70
Leaves, Buchu	0 25	0 30
" Foxglove	0 25	0 30
" Henbane	0 35	0 40
" Senna, Alex	0 30	0 60
" " E. I.	0 12½	0 20
" " Tinnevilly	0 20	0 30
" Uva Ursi	0 15	0 15
Lime, Carbolate.....brl	5 50	—
" Chloride	0 04½	0 06
" Sulphate	0 08	0 12½
Lead, Acetate	0 14	0 17
Leptandrin.....oz	0 60	—
Liq. Bismuth	0 50	0 75
Lye, Concentrated	1 50	2 00
Liquorice, Solazzi	0 46	0 48
" 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 17	0 20
" Calcined	0 65	0 75
" Citrate.....gran.	0 40	0 50
Mercury	0 90	0 95
" Bichlor	1 00	—
" Chloride	1 25	—
" C. Chalk	0 60	—
" Nit. Oxyd	1 30	—
Morphia Acet	4 10	4 25
" Mur.	4 65	5 50
" Sulph	4 25	4 40
Musk, pure grain.....oz	21 00	—
" Canton	0 90	1 20
Oil, Amonds, sweet	0 44	0 45
" " bitter	14 00	15 00
" Aniseed	3 60	4 00
" Bergamot, super	5 00	5 25
" Carraway	4 00	4 20
" Cassia	2 00	2 20
Castor, E. I	0 14	0 15
" Crystal	0 22	0 25
" Italian	0 26	0 28
" Citronella	1 25	1 60
" Cloves, Ang	1 00	1 00
" Cod Liver	1 35	1 50
" Croton	2 00	2 10
" Juniper Wood	0 80	1 00
" " Berries	6 00	7 00
" Lavand, Ang	16 00	17 60
" " Exotic	1 40	1 60
" Lemon, super	4 25	—
" " ord	2 60	—
" Orange	2 70	3 00
" Origanum	0 65	0 75
" Peppermint Ang	13 00	90 00
" " Amer	3 00	3 25
" Rose, Virgin	7 75	8 00
" " good	5 50	6 00
" Sassafras	0 85	0 95
" Wintergreen	6 50	7 00
" Wormwood, pure	5 80	6 50
Ointment, blue	0 70	0 80
Opium, Turkey	6 00	6 25
" " pulv	8 50	10 00

DRUGS, MEDICINES, &c.—*Cont'd*	$ c.	$ c
Orange Peel, opt.	0 33	0 42
" " good	0 12½	0 20
Pill, Blue, Mass	0 75	0 80
Potash, Bi.chrom	0 20	0 21
" Bi-tart	0 27	0 28
" Carbonate	0 14	0 20
" Chlorate	0 45	0 50
" Nitrate	10 50	11 00
Potassium, Bromide	1 20	1 80
" Cyanide	0 60	0 70
" Iodide	6 50	7 00
" Sulphuret	0 25	0 35
Pepsin, Boudault's oz	1 50	—
" Houghton's doz.	8 00	9 00
" Morson's oz.	0 85	1 10
Phosphorus	0 75	0 85
Podophyllin	0 50	0 60
Quinine, Pelletier's	—	2 25
" Howard's	2 20	—
" " 100 oz. case.	2 15	—
" " 25 oz. tin..	2 10	—
Root, Colombo	0 13	0 20
" Curcuma, grd	0 12½	0 17
" Dandelion	0 25	0 35
" Elecampane	0 14	0 17
" Gentian	0 10	0 12½
" " pulv	0 15	0 20
" Hellebore, pulv	0 17	0 20
" Ipecac, "	2 20	2 30
" Jalap, Vera Cruz	1 35	1 60
" " Tampico	0 90	1 00
" Liquorice, select	0 11	0 13
" " powdered	0 15	0 20
" Mandrake "	0 20	0 25
" Orris, "	0 20	0 25
" Rhubarb, Turkey	3 50	—
" " E. I	1 25	2 00
" " " pulv	1 40	2 50
" " " 2nd	1 30	1 50
" " French	0 75	—
" Sarsap., Hond	0 40	0 45
" " Jam	0 88	0 90
" Squills	0 10	0 15½
" Senega	1 35	1 40
" Spigelia	0 48	0 50
Sal., Epsom	2 25	3 00
" Rochelle	0 26	0 35
" Soda	0 01½	0 03
Seed, Anise	0 16	0 30
" Canary	0 05	0 06
Cardamon	3 50	3 75
" Fenugreek, g'd	0 08	0 10
" Hemp	0 06½	—
" Mustard, white	0 14	0 16
Saffron, American	4 00	5 00
" Spanish	17 00	18 00
Santonine	9 50	10 00
Sago	0 07½	0 09
Silver, Nitrate Cash	14 50	16 50
Soap, Castile, mottled	0 10	0 14
Soda Ash	0 03	0 04
" Bicarb. Newcastle	4 00	4 25
" " Howard's	0 14	0 16
" Caustic	0 04	0 05
Spirits Ammon., arom	0 25	0 35
Strychnine, Crystals	2 20	2 50
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 80	0 90
Zinc. Chloride oz	0 10	0 15
" Sulphate, pure	0 10	0 15
" " common	0 06	0 10
DYESTUFFS.		
Annatto	0 35 @	0 60
Analine, Magenta, cryst	3 25	4 00
" " liquid	2 00	—
Argols, ground	0 15	0 25
Blue Vitrol, pure	0 08	0 10
Camwood	0 06	0 09
Copperas, Green	0 01½	0 02½
Cudbear	0 16	0 25
Fustic, Cuban	0 02	0 04
Indigo, Bengal	2 40	2 50
" Madras	1 00	1 10
" Extract	0 28	0 35

DYESTUFFS—*Continued.*		
Japonica	0 05½	0 06½
Lacdye, powdered	0 33	0 38
Logwood	0 02	0 03
Logwood, Camp	0 02	0 3½
" Extract	0 10	0 14
" " 1 lb. bxs	0 14	—
" " ½ lb. "	0 15	—
Madder, best Dutch	0 16	0 17
" 2nd quality	0 15	0 16
Quercitron	0 03	0 05
Sumac	0 06	0 08
Tin, Muriate	0 10½	0 12½
Redwood	0 05	0 06
SPICES.		
Allspice	0 8½@	0 10
Cassia	0 38	0 40
Cloves	0 12½	0 15
Cayenne	0 18	0 25
Ginger, E. I	0 12	0 14
" Jam	0 20	0 30
Mace	1 35	1 40
Mustard, com	0 20	0 25
Nutmegs	0 80	0 85
Pepper, Black	0 19	0 20
" White	0 26	0 28
PAINTS, DRY.		
Black, Lamp, com	0 07 @	0 08
" " 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 25	0 35
" Magnesia	0 20	0 25
Litharge	0 06½	0 09
Pink, Rose	0 12½	0 15
Red Lead	0 06½	0 08
" Venetian	0 02½	0 03½
Sienna, B. & G	0 10	0 15
Umber	0 07	0 10
Vermillion, English	1 15	1 25
" American	0 25	0 35
Whiting	0 85	0 90
White Lead, dry, gen	0 08	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 03¾	0 04½
Yellow Ochre	0 08	0 12
White Lead, gen. 25 lb. tins	2 30	—
" " No. 1	2 10	—
" " No. 2	1 90	—
" " No. 3	1 65	—
" " com	1 30	—
White Zinc, Snow	2 75	3 25
NAVAL STORES.		
Black Pitch	4 00 @	4 20
Rosin, Strained	4 20	4 40
" Clear, pale	9 00	10 00
Spirits Turpentine	0 65	0 70
Tar Wood	4 50	4 75
OILS.		
Cod	0 62 @	0 65
Lard, extra	1 05	—
" No. 1	0 95	1 00
" No. 2	0 85	0 90
Linseed, Raw	0 77½	0 80
" Boiled	0 82½	0 85
Olive, Common	1 17	1 35
" Salad	1 80	2 30
" " Pints, cases	4 20	4 40
" " Quarts	3 60	3 00
Seal Oil, Pale	0 68	0 75
" " Straw	0 60	0 65
Sesame Salad	1 30	1 35
Sperm, genuine	1 90	2 00
Whale, refined	0 75	0 80

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