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Original and Selected Papers.

NOTE ON DILUTED PHOSPHORIC ACID.

BY H. H. CROFT.

Professor of Chemistry, University College, Toronto.

Some months since, a druggist of Yorkville called my attention to the fact that a white precipitate is formed on adding a solution of glacial phosphoric acid to ferric chloride, (tincture of iron.) Before I had leisure to make any experiments on the subject, a notice appeared in the *Canadian Pharmaceutical Journal* for April, of some investigation by Mr. L. Dohme, who arrived at the conclusion that the precipitate so formed was due to pyrophosphoric acid.

So-called glacial phosphoric acid, is, when properly prepared, metaphosphoric acid; HO PO_3 , old formula; H PO_3 , new empirical, $\left. \begin{matrix} \text{PO} \\ \text{H} \end{matrix} \right\} \text{O}_2$ typical. When dissolved in cold water it remains unchanged, but when warmed gradually passes into pyrophosphoric acid, $\text{H}_2\text{O}_2 \text{PO}_5$; $\text{H}_4\text{P}_2\text{O}_7$; $\left. \begin{matrix} 2 \text{PO} \\ \text{H}_4 \end{matrix} \right\} \text{O}_5$, by absorption of water, and finally into common or tribasic acid, $\text{H}_3\text{O}_3\text{PO}_5$; H_3PO_4 ; $\left. \begin{matrix} \text{PO} \\ \text{H}_3 \end{matrix} \right\} \text{O}_3$, these acids being referable respectively to the types of $\left. \begin{matrix} \text{H}_2 \\ \text{H}_2 \end{matrix} \right\} \text{O}_2$, $\left. \begin{matrix} \text{H}_5 \\ \text{H}_5 \end{matrix} \right\} \text{O}_6$, $\left. \begin{matrix} \text{H}_3 \\ \text{H}_3 \end{matrix} \right\} \text{O}_3$. The ordinary distinguishing tests employed are as follows, of course, for the free acids.

Tribasic phosphoric acid gives no precipitate with silver nitrate, barium chloride, or albumen.

Dibasic phosphoric acid gives a precipitate with silver nitrate and barium chloride, but none with albumen.

Monobasic phosphoric acid gives a precipitate with all three.

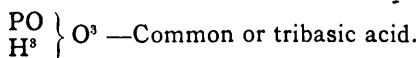
This latter acid is usually prepared by dissolving phosphorus in nitric acid, by long digestion, evaporating and heating so as to drive off as much water as possible; or by heating common ammonium phosphate $(\text{NH}_4)_2\text{H} \left. \begin{array}{l} \text{PO} \\ \text{H} \end{array} \right\} \text{O}_3 - (\text{NH}_4)_2\text{O} = \text{H} \left. \begin{array}{l} \text{PO} \\ \text{H} \end{array} \right\} \text{O}_3$.

Prepared in either of these ways and dissolved in cold water, it gives an immediate whitish precipitate with ferric chloride, as also with albumen; both these precipitate even in moderately dilute solutions. Heated for some time, it loses its power of precipitating albumen, but continues to act upon ferric salt. Boiled for a long time it precipitates neither. Pyrophosphoric acid obtained by decomposition of the lead salt, by hydrosulphuric acid, exhibits the same reaction as regards ferric chloride, boiled for some time it loses this power being converted into tribasic acid.

It appears therefore that both pyrophosphoric acid (Dohme) and metaphosphoric acid possess the power of producing a precipitate in ferric chloride, I may add, insoluble in acetic acid and not very easily soluble in hydrochloric acid, and hence ferric chloride may be employed as a good test for distinguishing the phosphoric acids. I am not aware that this fact has been noticed, and we are indebted to Mr. Dohme for its discovery. The numerous experiments which have led to this paper, were made for me by Mr. Cathron.

In using glacial phosphoric acid for medicinal purposes, it would therefore be well to boil the solution for some time, say half-an hour, before adding to the solution of iron.

For convenience of students, I append formulas showing derivation of acids and salts.



$\left. \begin{array}{l} \text{PO} \\ \text{H}^3 \end{array} \right\} \text{O}^3 - \text{H}^2\text{O} = \text{H} \left. \begin{array}{l} \text{PO} \\ \text{H} \end{array} \right\} \text{O}^2 \text{ — Metaphosphoric or monobasic acid.}$

$$\left. \begin{array}{l} 2 \text{ PO} \\ \text{H}^6 \end{array} \right\} \text{O}^6 - \text{H}^2\text{O} = \left. \begin{array}{l} 2 \text{ PO} \\ \text{H}^4 \end{array} \right\} \text{O}^5 - \text{Pyrophosphoric or tetra-} \\ \text{basic acid.}$$

$$\left. \begin{array}{l} \text{PO} \\ \text{Na}^2\text{H} \end{array} \right\} \text{O}^3 - \text{Common phosphate of soda.}$$

$$\left. \begin{array}{l} 2 \text{ PO} \\ \text{Na}^2\text{H} \end{array} \right\} \text{O}^3 - \text{H}^2\text{O} = \left. \begin{array}{l} 2 \text{ PO} \\ \text{Na}^4 \end{array} \right\} \text{O}^5 - \text{Pyrophosphate of soda.}$$

$$\left. \begin{array}{l} \text{PO} \\ \text{NaH}^2 \end{array} \right\} \text{O}^3 - \text{H}^2\text{O} = \left. \begin{array}{l} \text{PO} \\ \text{Na} \end{array} \right\} \text{O}^2 - \text{Metaphosphate of soda.}$$

Laboratory, University College,
May 4th, 1875.

SCRAPS.

BY "MONAD."

REACTION OF THE SALTS OF THE ALKALOIDS WITH POTASSIUM IODIDE IN PRESENCE OF FERRIC SALTS.

A short time ago I received the following prescription :—

$$\begin{array}{l} \mathfrak{R} \quad \text{Potass iodid} \quad - \quad - \quad - \quad \mathfrak{z}i. \\ \quad \text{Tinct. ferri perchl} \quad - \quad - \quad \mathfrak{z}i. \\ \quad \text{Strychnia sulph} \quad - \quad - \quad \text{gr } i. \\ \quad \text{Aqua} \quad - \quad - \quad - \quad - \quad \mathfrak{z}xv. \end{array}$$

The strychnia sulphate dissolved in a little water was added last, and the mixture which had been clear, became filled with a dirty brick red precipitate, which gradually became darker. The precipitate on separation was seen to be finely crystalline, with many larger glistening needles, possessing the properties of free iodine.

A few experiments brought me to the following conclusions :—
The salts of morphia, quinia, cinchonia, strychnia, and atropia, in the presence of persalts of iron, decompose potassium iodide, precipitating free iodine. The protosalts of iron have not this effect :

ESS BOUQUET.

Otto Rose	-	-	-	-	6 drams.
" Lemon	-	-	-	-	4 "
" Bergamot	-	-	-	-	2 oz.
Ambergris	-	-	-	-	36 grains.
Orris Root, grd	-	-	-	-	11 oz.
Alcohol deod.	-	-	-	-	60 oz.

Macerate the ambergris and orris in the spirit for one month, in a warm place. Filter and add the ottos.

EXT. MUSK.

Grain Musk	-	-	-	-	$\frac{1}{4}$ oz.
Ambergris	-	-	-	-	$1\frac{1}{2}$ dr.
Otto Rose	-	-	-	-	45 M.
Alcohol deod.	-	-	-	-	35 oz.

Macerate for one month in a warm place and filter.

 THE PURITY OF CHLOROFORM.*

The substitution of grain spirit for pure spirit of wine appears to be the principal cause of the bad quality of certain commercial chloroforms. M. Rump has had the opportunity of rectifying large quantities of chloroform from various sources; one sample came from a manufactory in Saxony, another, in very good condition, from a depot established during the war of 1870. This chloroform was submitted to fractional distillation, and each tenth part separated. The last pound collected boiled between 72° and 82° C. The distillation afforded the following remarks. As the temperature reached 57° bubbles of steam rose, and, condensing, the neck of the retort bedewed. M. Rump attributes these traces of water to the steam of water evolved by the chloroform. The liquid commenced boiling between 59° and 59.5° ; the product ($D=1.480$ to 1.481) was shaken with water, to free it from alcohol, then dehydrated by chloride of calcium. After this treatment the product appeared pure; density, 1.499 . When the boiling point reached 60° the receiver was changed, and the temperature rose slowly to $60^{\circ}.75$. The fractionation of the products gave perfectly pure chloroform, boiling at $60^{\circ}.5$, under a pressure of 760 millimetres. Further distillation separated products boiling between 61° and 62° , which consisted mainly of impurities. Their odour suggested amylic and butyric compounds, and recalled the smell perceived when chlorine or chloride of lime acts on animal substances. One sample of commercial chloroform, origin unknown, submitted to the same treatment, gave an odour of acetic ether. No sort of solid chlorine compound could be obtained from any of these products. The dense liquids arising from these different chloroforms were distilled over alcoholic potash. There was effervescence, and the density of the products rose to 1.51 , and the boiling point to 70° . A very small quantity of alcohol

* Journ de Pharm. et de Chemie, from Archiv. de Pharm., October 1874, p. 373. Translated in Chemist and Druggist.

sensibly lowered the boiling point. Mr. Schacht has proved the stability of pure chloroform *in vacuo*, even when exposed to sunlight. But under ordinary conditions the air has a manifest influence on chloroform; moisture renders its decomposition possible even in the dark. Chlor-oxy-carbonic gas is one of the products of distillation. M. Rump considers water to be the most active agent in the decomposition of chloroform. The alcohol contained in nearly all commercial chloroforms opposes this destructive action of water. He recommends that chloroform should be kept in glass bottles perfectly dry and clean. Chloroform containing $\frac{1}{8}$ per cent. of alcohol, and kept in the sun for two weeks, was less affected than some containing $\frac{1}{4}$ to $\frac{1}{2}$ per cent. of alcohol. The addition of $\frac{1}{8}$ per cent. of alcohol to chloroform lowered its density 0.002. Chloroform which has suffered decomposition rapidly decolorises sunflower paper; this is therefore, a good test of its condition. In evaporating pure chloroform by heat, from a one per cent solution of nitrate of silver the latter remains clear; if impure, it becomes more or less turbid, from formation of chloride of silver. The unpleasantly smelling products which impair the quality of chloroform and raise its boiling point, originate in the bodies foreign to pure alcohol produced by the distillation of grain. These facilitate the decomposition of chloroform, and cause the cough which troubles those who work with it. The rule should be to employ no alcohol charged with amylic bodies.

SELECTIONS FROM THE DANISH ARCHIVES FOR PHARMACY.*

BY HANS M. WILDER.

PRESERVATION OF MEDICINAL PREPARATIONS BY FILTERED AIR.

Prof. Almèn (Upsala, Sweden) has instituted a series of experiments, which confirm the observations of Dusch and Schrøder (*see* "Amer. Jour. Pharm.," 1854, vol. xxiv, p. 376) and those of Folberth (*ibid*, 1862, vol. xxiv, p. 336), respecting the possibility of keeping infusions, decoctions and similar (under ordinary circumstances easily spoiled) preparations for years.

This is done by combining the method of Appert with the use of a cotton plug. The preparation to be preserved is heated to the boiling point and stoppered with cotton-wool. If not all the contents of a bottle have to be used at once, then the cotton plug has to be replaced by a cork, through which passes, first, a short tube (the

*From the American Journal of Pharmacy.

nethermost end of which is drawn out to a point), filled loosely with cotton-wool; and, then, a syphon, the long end of which is furnished with a gum-elastic tube and spring-compressor. This arrangement is, of course, to be applied before heating. As the liquid is drawn off, the air filters through the cotton.

The bottles have to be rinsed with *boiling* water, since cold water contains germs, on the presence of which fermentation and putrefaction depend.

COMPRESSED POWDERS.—Prof. Rosenthal (Berlin, Prussia) recommends to compress bulky powders which have to be taken in large doses; for instance, Kouso, and other worm medicines. He does this by means of a common press (vertical), the lower cross-piece of which is provided with a hole, which can be covered by a plate. A tube is put on top of said plate, and the several doses of the powder are introduced, separated by small metal cylinders. Strong pressure is now applied, the above mentioned plate is removed, and the compressed powder tablets fall through the hole in the cross-piece. It will be seen that, since no water or other constituent is used, said tablets must dissolve readily in the stomach. The largest convenient size to swallow will be found to be 1-2 grams. (*Berliner Klin. Wochenschrift*, 1874.

NITROUS OXIDE (LAUGHING GAS.)—A circular of the Royal Danish Board of Health (June, 1873), provides, that: 1st. Nitrous oxide gas must be dispensed from pharmacies only, on requisition (prescription) of an authorized physician or dentist. 2nd. The reservoir must be sealed and labelled: "Nitrous oxide gas." It does not expect every apothecary to prepare said gas, but requires the manufacturers to see, that: 1st. The nitrate of ammonia does not contain chlorine, sulphuric acid nor nitrate of potassa. 2d. That the nitrous oxide gas passes through water, a solution of protosulphate of iron and a solution of potassa or soda. 3d. The gas must not be dispensed, unless it has been in contact with water for at least 24 hours.

ON THE PREPARATION OF FERROUS SULPHIDE.

BY JAMES F. BABCOCK.

Ferrous sulphide, or protosulphuret of iron, as it was formerly called, though an article of daily use in every laboratory, is not readily procured in the market; or, if obtained, is generally of an inferior quality.

Ferrous sulphide should be in well fused masses, which are readily reduced in size by slight blows in an iron mortar; but most

of the ferrous sulphide offered for sale consists of somewhat loosely coherent nodules imperfectly fused, and mixed with much metallic iron. Frequently the greater portion of it is in a sort of coarse powder. Such products are poorly adapted to the production of sulphuretted hydrogen for uses in the laboratory. The metallic iron exhausts the sulphuric acid used, producing hydrogen, which is not only useless for the purposes of analysis, but dilutes the sulphuretted hydrogen which is evolved at the same time.

Finely divided sulphide contains not unfrequently much unchanged iron filings, or, if pure, cannot be used in any of the self-regulating generators for the preparation of sulphuretted hydrogen. The fine particles find their way through the basket or support upon which they are held, into the acid below, and the evolution of gas continues after the stop-cock intended to control its supply has been turned. If used in a flask or bottle, the finely divided iron exposes so much surface to the action of the acid that the generation of gas becomes too rapid, and the liquid frequently froths over.

The combination of sulphur and iron to form ferrous sulphide is very easily managed upon a small scale, but when one has to prepare a number of pounds of this product suitable for laboratory purposes, the processes given in the books are not very satisfactory either in their management or their results.

A process frequently mentioned in the books consists in introducing into a red-hot crucible an intimate mixture of thirty parts of iron filings and twenty-one parts of flowers of sulphur in small portions at a time; but the result of this experiment is generally, that most of the sulphur volatilizes or is consumed before the iron attains a temperature sufficiently high to combine with it, and thus much metallic iron becomes mixed with the product. Ferrous sulphide is somewhat difficult to fuse by direct heat in any ordinary laboratory furnace, and therefore advantage should be taken of the intense heat produced by the combination of the sulphur and iron at the moment of combination, which is sufficient to fuse the product obtained, so that it can be poured out of the crucible upon a flat plate or stone.

The following modification of a process given by Fresenius (*Qualitative Analysis*) has been long used by the writer, and has given highly satisfactory results. It is adapted to the production of from one to twenty-five pounds at a single operation, and gives a product which is well fused, free from iron, and in brittle masses, which may be readily reduced to the required size.

A hessian or blacklead crucible of any desired capacity is somewhat loosely filled with ordinary shingle-nails and is well bedded in coal in a furnace with a good draught.

The crucible should be covered with a flat plate of soapstone, or fire clay. In the centre of the plate is bored a hole of about an inch in diameter. This hole is closed with a small fire clay crucible cover. The iron in the carefully covered crucible is brought to a

bright red-heat, and then a ladleful of sulphur which has been melted in a thin iron vessel over a Bunsen burner is carefully and slowly poured through the small hole in the flat plate laid upon the crucible.

Intense combustion of the iron in the vapor of sulphur at once ensues; the product—pure ferrous sulphide—melts and runs to the bottom of the crucible, draining away from the nails which have escaped the action of the sulphur.

Another ladleful of melted sulphur is then poured through the small hole as before, and this operation is repeated until all of the iron has been melted down. The still fluid mass of fused ferrous sulphide is then poured from the crucible upon a slab, or may be cast into little bars of about one inch in width, and of any desired thickness or length.

By having the nails as hot as possible, and uncovering only the small hole instead of the whole crucible when the sulphur is added, and using melted sulphur instead of lumps thrown into the crucible, the process becomes very simple, and gives a product which leaves nothing to be desired.

The writer has been in the habit of casting little cylinders of ferrous sulphide prepared in this manner upon a piece of stout copper wire, which, with the end of the wire bent into a hook, can be used in the bell of an ordinary glass hydrogen generator in the same manner as zinc is sometimes used in such apparatus, thus avoiding the trouble of a copper basket filled with small fragments, as in the usual arrangement.

NOTE ON SALICYLIC ACID.*

BY EDWARD R. SQUIBB, M. D., OF BROOKLYN, N. Y.

This substance long known as a rare and curious chemical derived from the vegetable kingdom, has lately been brought into prominent notice, chiefly in Germany, from its relation to those changes which are commonly known, and best understood as fermentations, to which class or kind of changes so many diseases and pathological conditions are now pretty well known to belong.

The writer knows far too little of the subject and its relations to attempt an accurate or exhaustive paper upon it, and the object of this note is simply to call attention to it, that it may be read up in the current literature—to give a brief outline of its bibliography, that reference may be made in regard to its history—and to offer some thoughts in regard to its sphere in medicine.

*Read before the Medical Society of the State of New York, and communicated by the Author.

Salicin is a glucoside, or neutral vegetable principle discovered by Leroux¹ in 1830, in the bark of some species of willow, *Salix*, whence its name. It was afterward found in various species of poplar,² and in other trees and plants. Salicin was chiefly investigated by Piria³ who gave an elaborate account of its derivatives, and among these, of salicylic acid. Early in its history the acid was prepared by Lowing and Weidmann⁴ from the flowers of *Spiræa ulmaria*; and later, a research by Prof. Procter,⁵ of Philadelphia, showed that our oil of wintergreen, *Gaultheria procumbens*, was really a salicylic ether; and from this source salicylic acid was obtained by Cahours.⁶ Gerhardt,⁷ Ettling,⁸ and others contributed to the researches by which the properties and reactions of salicylic acid were accurately determined and its composition fixed; but as yet it was but a chemical curiosity whose potential possibilities were quite unknown. It still belonged to that class of substances which had simply consumed a large amount of patient labor, and in relation to which the rigid utilitarian asked Michael Faraday "What is the use of such things?" and received for reply the answer, "What is the use of a baby?"

The physiological and pathological effects of salicin though imperfectly investigated, seem to have gradually and slowly directed attention to those of its derivatives, and occasional paragraphs have appeared in current scientific literature, from time to time, upon salicylic acid for some years past. But only within a year or two—and the writer regrets that he does not know by whom first—German writers have alluded to its peculiar and powerful effects as an anti-ferment, and antiseptic. As its peculiar powers were recognized, and its importance became possible and probable, the sources from which it had been obtained as a chemical curiosity became impracticable, in consequence of the small quantity which could be obtained from them, and the great cost in material and labor.

The next step in the progress of salicylic acid toward practical utility affords an excellent illustration of the progress in chemical knowledge made of late years.

The modern chemist appears to know, within certain limits, the combinations of the elements in organic substances very much as he knows the axes of crystals, and hence deduces their planes of cleavage. That is he knows how they will split up under given conditions, and what new arrangements of their elements are possi-

1. Journ. de Chim. Med. T. 6, F. 341.
2. Braconnot, Ann. Chim. Phys. T. 44, F. 296.
3. Piria, 1, Compt. Rend. T. 6, F. 388, and Ann. Pharm. T. 30, F. 165.
4. Jour. pr. Chem. Bd. 19, S. 236.
5. Amer. Journ. Pharm., v. 14, p. 211.
6. Compt. Rend. T. 16, F. 863.
7. N. Ann. Chim. Phys., T. 7, F. 217.
8. Ann. Pharm., T. 53, F. 77.

ble, or even practicable. And farther, he knows by pure reasoning upon facts, what new elements to introduce between the molecules of one combination to split it up by a new set of affinities into new combinations never before seen or reached, and which would have remained long unknown under the mere empirical researches of the older chemistry. The peculiar properties and reactions of salicylic acid as an antiferment producing a demand for it, the German chemists, Kolbe,¹ and Lautemann sought for an organic compound which from its elementary composition might be split, or dissociated into the desired new compound salicylic acid. This substance, whose molecule might be broken up, they found in Phenol, or the so-called Carboic Acid, and it is a very curious circumstance—purely accidental so far as this writer knows—that a substance of well and long established character as an antiferment, should have offered to these chemists a molecular constitution so well adapted to be broken up into a still more powerful antiferment; for there is no relation whatever, either in composition, or chemical, or physical properties between carboic acid and salicylic acid, except in their effects as antiferments, and the two may, so far as present knowledge extends, accomplish these effects by similar, or by altogether different reactions. The agent which the German chemists selected to resolve the molecule of Phenol into other molecules, one of which should be salicylic acid, was dry carbonic acid or carbonic anhydride, as it is called in the new chemistry. Thus from the action of carbonic acid on carboic acid, salicylic acid is produced; a process which is about as far from the original willow tree as a source of the acid as can well be imagined, and yet a process which is as much the result of human knowledge based upon human research as that by which Le Verrier and Adams discovered the planet Neptune. It appears that where Phenol and Cresol, and perhaps others of the class of phenols, are combined with an alkali metal such as sodium or potassium, thus forming phenol-sodium (often called phenate of soda) for example, and well dried carbonic anhydride is passed through the dry powder of phenol-sodium heated to 100° to 250° C.=212° to 482° F., the reaction occurs which produces salicylate of sodium and other compounds. The salicylate of sodium thus formed is dissolved in water and decomposed by hydrochloric acid which uniting with the sodium by superior affinity sets free the salicylic acid in the form of small crystals. These crystals are washed and recrystallized from a hot solution, and when dried form a crystalline powder of a light brown color, somewhat resembling in color, the powder of pale cinchona bark. This is unbleached salicylic acid and is probably pure enough for almost all, if not for all the purposes to which the

1. *Archiv. der Pharmacie* (3) v. 5, p. 445, from *Jour. fur Practische Chemie*. Bd. 10, S. 89, and quoted in *Ding. Polyt. Journ.* Bd. 214, S. 132, and in *Pharm. Jour. and Trans. of London*, Third series, No. 231.

acid is at present applied to practical uses. The small proportion of coloring matter which it contains in this condition is held by it with great tenacity, and the further processes by which it may be obtained of various shades up to whiteness are so difficult, troublesome, and expensive, that they more than double the cost of production. This bleaching may be accomplished in various ways to a certain extent, but to get the acid quite white, Kolbe recommends that it be converted into an ether, and this ether be again decomposed. In the writer's practice no good plan of decolorizing has yet been reached, and as the decolorizing has not yet been shown to be necessary or very useful, no great attention has yet been given to it. The acid imported from Germany at very high prices is occasionally quite white; but most of that sold at the more moderate prices of two to three dollars per ounce is of various degrees of whiteness, up to a very light cream color with a reddish tinge. These varying shades of color seem to show that bleaching processes, more or less effective, have been used with all the acid yet imported into this country; while, so far as known, none has been made here until the writer lately undertook it. Hence the entirely natural, or entirely unbleached acid has not, so far as known, been yet used to any considerable extent; and it is a mere reasoning process based upon the quantity and qualities of the coloring matter in the well-made unbleached acid by which it is inferred that for most, if not for all of its present uses, this is as good as the more or less bleached product. If the well-made unbleached acid be found to subserve all the useful purposes to which the substance may be applicable, as is confidently expected by this writer; and if the substance should even in moderate degree realize the expectations of its importance in the arts, and in medicine, as indicated by the European authorities, the process of Kolbe will make it practically attainable in the necessary quantities at a far lower cost; whilst without some such process it would be of very limited use to mankind, whatever might be its powers. Whether bleached or unbleached, the acid is in minute broken acicular crystals, which give it the appearance of a granular powder, soft and smooth under the pestle or knife, but somewhat rough or resinous when rubbed between the fingers. This powder is odorless and nearly tasteless. It has, however, a sweetish and astringent after-taste with slight acidity in the fauces, but none in the mouth; and though tasteless, it leaves a disposition or inclination to expectorate which continues for some time.

It is practically insoluble in cold water, but is very soluble in hot water; and the water of a hot solution retains when cold, in proportion to its coldness, from about one part in two hundred and fifty, to one part in five hundred of the solution. The presence of various neutral salts in small proportion in the water render it far more soluble. Up to this time phosphate of sodium seems to have

been chiefly used in Germany¹ to render it more soluble in water for medicinal purposes, and it is said that three parts of phosphate of sodium will render one part of the acid easily soluble in fifty parts of water. It is much more soluble in alcohol and ether than in water. It melts at about $125^{\circ}\text{C.} = 257^{\circ}\text{F.}$, and sublimes at about $200^{\circ}\text{C.} = 392^{\circ}\text{F.}$ ² In common with other similar acids it forms salts with the principal bases, but these seem thus far to be difficult to make, and their effects have not been investigated.

It is used for medical and surgical purposes either dry or in solution. When used dry it is sprinkled on to wounds, ulcers, or dressings in form of very fine powder, in very small quantities, either simply powdered, or mixed in various proportions with some diluent, such as starch. When used in simple solution either for spraying surfaces, or for washes or gargles, it is used in tepid solution of about one part to three hundred parts of water. Where stronger solutions are required for washes, garles, or to moisten dressings, one part of the acid and three parts of phosphate of sodium to fifty parts of water have been used. When applied to wounds it appears immediately in the urine.³

Its alleged advantages over all other antiseptics are: First, that it is far more powerful and effective in smaller quantities; and Secondly, that it is, in all quantities necessary for complete effectiveness, entirely devoid of irritant action upon the living tissues. It is not caustic nor corrosive in any quantity, and never produces inflammation. In large quantities it may be irritant and painful, but yet rarely surpasses a stimulant effect, while it appears to be quite neutral in the very small quantities which are yet thoroughly effective. Thirdly, it is said to reach and prevent processes of decomposition which are beyond the reach of all other antiseptics or antiferments. These processes are of two kinds, namely—vital, or those in which living organisms have an important part, such as that produced by yeast and many of those which occur in putrefaction; and chemical, or those which occur independent of vitality, as the production of the volatile oils in mustard and bitter almonds, the effect of diastase, etc. Now, while carbolic acid and other antiferments are azymotic, or completely arrest or prevent fermentations of the first kind, they are powerless with the chemical processes. Salicylic acid is said to be more effective with the vital ferments, and equally effective with the chemical.

Fourthly, in quantities said to be thoroughly effective, it is entirely odorless and tasteless, and harmless, whilst it has no poisonous effect in any reasonable quantity.

It prevents or arrests the souring of worts, washes and beers of the brewers; and prevents or arrests the putrefactive agencies which

1. Thiersch. Pharm. Centralhalle, Oct. 22, Nov. 5.
2. Watts' Chem. Dictionary, Art; "Salicylic Acid."
3. Thiersch. as above cited.

are so troublesome and destructive to the glue manufacturers; and these and similar trades have thus far seemed to be its principal consumers. Separate portions of fresh milk set aside to become sour, one to which 0.04 per cent. of salicylic acid was added soured 36 hours later than the other. Urine thus protected, was on the third day still clear, and free from ammoniacal odor.

Varying proportions of the acid added to accurately measured separate portions of sweet milk, and these carefully observed afterward until they sour—or, by the use of meat juice instead of milk, observed closely for signs of putrefaction—would offer good indications of the quantities required to arrest these varieties of fermentation.

Professor Phiersch, of Leipsic,¹ used it upon contused and incised wounds, and in operations, with excellent general results, destroying the fetid odor of cancerous surfaces, and pyæmic ulcerations. To such uses this writer would add the suggestion that for washing out the cavities of the abdomen and chest after those operations which tend so strongly to septicæmia, solutions of salicylic acid would seem to offer very great advantages should it prove to be as bland and unirritating as it is stated to be, and yet so effective.

Most of these statements are summed up from the periodical literature of continental Europe during the past six months, little having appeared upon the subject in Great Britain, or in this country, and nothing having been done with it so far as known in either country.

In occasional paragraphs and allusions benzoic acid has been coupled with salicylic acid as being only second to it in effectiveness as an antiferment, and with similar advantages.

These statements are collated and condensed here as being well worth attention in themselves, and in their relations to the phenomena of septic poisoning as already known. But they have a new significance, or at least suggest to this writer a new train of thought when viewed in connection with some researches now in progress, and but just appearing in the periodical literature.

Experiments² were made upon animals by the injection of measured quantities of septic blood. The blood of a healthy animal was allowed to become putrid. Increasing doses of this were injected into healthy animals until the amount necessary to cause death was ascertained. This quantity proved to be large, the animals recovering from all the small doses. Blood from the animal whose death was caused by injections of putrid blood was injected in

1. Pharm. Centralhalle, Nos. 44 and 45, 1874.

2 Bergman, Panum, Davaine, Vuipian and Bouley—the latter researches in *Bulletins de l'Acad. de Med.* 1872, 1873, and Davaine, translated by Mary C. Putnam, M.D., in *Archives of Scientific and Practical Medicine*, by C. E. Brown-Sequard and E. C. Guignin, No. 5, p. 469.

increasing doses into healthy animals until the fatal dose was reached, and this dose was found to be smaller than that which killed the first animal. The blood of the second dead animal was used on healthy subjects in the same way as that of the first, and proved fatal in still smaller quantity. The experiments were continued upon the same plan until finally a point was reached when a very minute portion—the fraction of a drop perhaps—from the last animal proved fatal to the next, with more violent toxic symptoms and a shorter course. The important indications of this series of experiments is of course the rapid accumulation of potency in septic poisoning. And the question put by this indication is not only as to how this potency accumulates, but also how to prevent and arrest it. Metro-peritonitis, and common pyæmia would, doubtless, unobstructed, accumulate potency in the same way without visible inoculation, and often do continue and accumulate even against the vigorous application of the best means of prevention yet known. No hypothesis can be constructed that will embrace the phenomena of septic poisoning as they are now rapidly being investigated without including zymotic diseases and the cachexiæ, and none will account for the phenomena already observed without bringing it within the sphere of what is called, in some of its degrees or phases, fermentation. Hence, if the medical art is to keep pace with the progress of the physical sciences, physicians cannot afford to pass by such articles as salicylic and benzoic acids when offered by chemistry, without investigating their effects upon disease, even though not one out of ten should repay the labor of investigation, for it is certainly in this direction of research that medicine must look with greatest hope of success to control those abnormal vital processes which so far may be modified, but not stopped. For example: Suppose a primary syphilitic or cancerous sore, or a diphtheritic patch, or even a cachectic pulmonary infraction, while these are merely the localized phenomena of an external inoculation, or of an internal taint,—they must all be considered to partake of the nature of a fermentation, and by some such process invade the whole organism. Then suppose an antiferment, which when applied to any surface not covered by an impervious cuticle very soon appears unchanged, first in the blood and then in the secretions and excretions—the manifest logical antagonism of such substance to the diseased conditions becomes too important to be neglected, and the counsels of wisdom demand that its claims to such antagonism be disproved before it be dismissed. The question as to what may become of the cancer-cell, or of the less tangible precedent cause of it, or of the bacteria, or the precedent conditions which increase their fertility, under the well-directed influence of this class of agents, is, perhaps, the most important one in all medical science. And just in proportion as accurate research develops agents of greater and greater power, will be the prospect of better success in treatment.

The phenols, especially the so-called carbolic and cresylic acids (Phenol and Cresol), were, and must always remain to be, most important additions to this class of agents, surpassing in power all that had been previously tried. And if now salicylic acid shall prove more potent than the phenols the farther gain will be very great, and the researches upon it will again lead up toward future discoveries of still greater power.

Brooklyn, February 1, 1875.

THE PRESENCE OF LEAD IODIDE IN SYRUP OF IODIDE OF IRON.*

BY W. A. SHENSTONE.

Some two years since a specimen of syrup of iodide of iron, containing spangles of lead iodide, was exhibited at a meeting of the Pharmaceutical Society by Dr. Attfield, who had it from Mr. Rimington, of Bradford. A good deal of information concerning the contamination was elicited from some of the members present, but I do not think the matter was much noticed by pharmacists generally, and therefore, having recently met with a case of the kind, I thought it probable that a few words on the subject would not be without interest.

The source of the lead in these cases appears to vary. Mr. Williams, who has met with the difficulty on a large scale, states that in all cases it has been due to the use of impure iron filings, whilst Mr. Umney finds that it only occurs when the iodide is prepared with rough iodine, which sometimes contains lead from having been sublimed into leaden vessels. Obviously the use of pure iron wire and resublimed iodine would remove these causes of trouble, and in the present case these precautions were taken; moreover, the same supply of iron and iodide had been repeatedly used for the purpose, and the solution of iron iodide was prepared in an enamelled vessel, which also had been often previously employed; it appears, however, that on this occasion the mixture of iron, iodine, and water was allowed, by an accident, to become much hotter than usual, and this leads me to think that, under [the conditions of the operation, the iodine acted on lead contained in the enamel, and so brought about the mishap. I would, therefore, point out the advisability of avoiding the use of enamelled vessels in preparing iron iodide, if it is intended to apply heat during the process. There are thus three ready means by which lead iodide may get into the syrup of iodide

*Read before the British Pharmaceutical Association, January 22nd, 1875, and published in the *Pharmaceutical Journal and Transactions*.

of iron, and I wish I could indicate three equally easy methods of getting it out again, but this I am unable to do. Up to the present only one process has been proposed, viz., diluting and decomposing the lead iodide with sulphuretted hydrogen. This is said by Mr. Williams to succeed; but it seems to me that the necessary reconcentration, either by addition of more iron iodide and sugar, or by other means, is a considerable disadvantage, and I have thought it might be avoided by passing the gas into the undiluted syrup kept hot by a water-bath, removing the lead sulphide by subsidence or straining, chasing out excess of sulphuretted hydrogen by a current of carbonic acid gas, and finally warming the syrup with a few fragments of iron wire to remove any hydriodic acid that may remain. I intended subjecting this process to the test of experiment, but unfortunately have not had the necessary time at my command. I have, however, found that all but a very small portion of the lead is converted into sulphide by passing the gas into the hot syrup for a comparatively short time, and therefore feel justified in recommending a further trial of the method, especially as the process by dilution can be just as well resorted to afterwards, in case of the above plan failing.

PHYSIOLOGICAL EFFECTS OF ALCOHOL.

In concluding the series of lectures recently delivered before the Society of Arts, Dr. Richardson summed up with the following hygienic considerations:—

“The facts I have endeavoured to lay before you in this as well as in the last lecture will suggest to your minds many thoughts bearing upon the health of individuals and communities, in so far as health is affected by the potent agent, alcohol. I need hardly, indeed, presume to offer any suggestions, but one or two of a specially practical and everyday character may be ventured.

“I am bound to intimate that the popular idea of administering alcohol for the purpose of sustaining the animal warmth is an entire and dangerous error, and that when it is brought into practice during extremely cold weather is calculated to lead even to fatal consequences, from the readiness with which it permits the blood to become congested in the vital organs. I cannot too forcibly impress the fact that cold and alcohol act, physiologically, in the same manner, and that, combined in action, every danger resulting from either agent is doubled.

“Whenever we see a person disposed to meet the effects of cold by strong drink it is our duty to endeavour to check that effort, and whenever we see an unfortunate person under the influence of alcohol it is our duty to suggest warmth as the best means for his

recovery. These facts prompt many other useful ideas of detail, in our common life. If, for instance, our police were taught the simple art of taking the animal temperature of those persons whom they find in the streets in a state of insensibility, the results would be most beneficial. The operation is one that hundreds of nurses now carry out daily, and applied by our police-officers it would enable them not only to detect the difference between a man in an apoplectic fit and a man intoxicated, but would suggest naturally the instant abolition of the barbarous practice of thrusting the really intoxicated into a cold and damp cell, which to such a one is actually an anteroom to the grave.

“Once more: I would earnestly impress that the systematic administration of alcohol for the purpose of giving and sustaining strength is an entire delusion. I am not going to say that occasions do not arise when an inebriated or fainting heart is temporarily relieved by the relaxation of the vessels which alcohol, on its diffusion through the blood, induces; but that this spirit gives any persistent increase of power by which men are enabled to perform more persistent work is a mistake as serious as it is universal.

“Again the belief that alcohol may be used with advantage to fatten the body is, when it is acted upon, fraught with danger. For if we could successfully fatten the body we should but destroy it the more swiftly and surely; and as the fattening which follows the use of alcohol is not confined to the external development of fat but extends to a degeneration through the minute structures of the vital organs, including the heart itself, the danger is painfully apparent.

“In conclusion, whatever good can come from alcohol, or whatever evil, is all included in that primary physiological and luxurious action of the agent upon the nervous supply of the circulation to which I have endeavoured so earnestly to direct your minds. If it be really a luxury for the heart to be lifted up by alcohol; for the blood to course more swiftly through the brain; for the thoughts to flow more vehemently; for words to come more fluently; for emotions to rise ecstatically, and for life to rush on beyond the race set by nature; then, those who enjoy the luxury must enjoy it—with the consequences.”

THE BOTANICAL SOURCE OF MEDICINAL RHUBARB.*

Regel's *Gartenflora* for January contains, among other things, not the promised revision of species of *Rheum*, but a figure and a description of, and some historical notes on, *Rheum palmatum* var. *Tanguticum*, by Maximowicz. Although he does not dispute the fact that *Rheum officinale* of Baillon, figured in the December num-

*From the *Gardeners' Chronicle*.

ber of the *Botanical Magazine* of last year, yields a commercial Rhubarb, he contends that the drug known in England as Turkey Rhubarb, which came to us through Siberia by way of Kiachta, was the produce of the plant he describes. We say came, because the trade from that source has been destroyed, not, as Maximowicz says, in consequence of the attempt of some of the tribes to overthrow Chinese rule, but, as related in Fluckiger and Hanbury's 'Pharmacographia' in consequence of the very strict supervision exercised by the Russian Government. In the work just named a very full history of medicinal Rhubarb is given. Maximowicz's plant was collected by Przewalski, in 1872-3, in the vicinity of Lake Koko Nor, North West China. It is, or was, extensively cultivated in that district, and the wild plant was also collected. An account is also given of the method of its cultivation and preparation, but this part adds little to our knowledge of the requirements and conditions necessary for the profitable cultivation of Rhubarb. The plant figured agrees in all respects with a specimen in the Kew Herbarium labelled "Rheum palmatum, from Pallas," and also with another from Dr. Lindley; and there seems little doubt that the account given of its previous introduction about 125 years back is correct. The Russian officials stationed on the frontier were instructed to obtain seeds or plants of the genuine Rhubarb, if possible; and in 1870 they succeeded in obtaining a quantity of seed, though they had to pay a high price for it. But the "heathen Chinese" was too crafty for them, the plants raised from this precious seed proving to be nothing more than the well-known Siberian *R. undulatum*. However, 1750 the true plant was procured, and from Russia it spread over various parts of Europe, including Britain, so after all we have, according to Maximowicz, been seeking for a plant we all ready possessed. He goes on: "Let it be admitted that we now possess two species which furnishes a superior quality of Rhubarb, still *R. palmatum* has the advantage of being the genuine plant that produced the drug whose reputation dates from the time of the Arabian and Greek physicians." Speaking of the cultivation in Europe of Rhubarb for medicinal purposes, Maximowicz says that *R. palmatum* has proved rather unprofitable on account of the principal root decaying, and thus leaving only the less valuable lateral ones; and he adds that to a certain extent this had been the case with other species. So far as this country is concerned, we do not think these remarks are applicable. There is certainly a difference in the hardiness of the species. *R. officinale* was rather severely injured by frost at Kew last spring. We know nothing respecting the constitution of *R. palmatum*, but *R. Rhaponticum*, *undulatum*, and others are hardier than *R. officinale*.

COMMERCIAL GLUE.

In a late number of the *American Chemist*, Mr. S. D. Hayes gives the following interesting items relating to the composition of ordinary glue.

Analyses of two samples of white glue, of the best grade, yielded the following results :—

	"No. 1 extra C," glue.	Frozen glue.
Moisture (loss of weight at 212 degs Fah,	16.70	16.28
Gelatin, with a little animal fiber and fats	79.85	80.42
Carbonate of Lime.....	1.42	1.33
Sulphate of Lime.....	0.41	0.34
Phosphate of magnesia... ..	0.35	0.31
Alkaline salts.....	0.17	0.12
Silica, oxide of iron, etc	0.09	0.08
Oxide of zinc	1.01	1.12
Total.....	100.00	100.00

Analyses of ten more samples of frozen and sheet glue, of common grades, and from different makers, showed the proportion of water contained in them to vary from fourteen to eighteen per cent., averaging seventeen per cent. And the proportion of ash or mineral matter varied from three to six per cent., averaging rather less than four per cent. Two of these samples contained about one per cent. of white zinc, and two of them contained sulphate of lime.

Analyses of two samples of commercial gelatin averaged sixteen and a half per cent. of water, and 2.56 and 3.11 per cent of ash respectively. There was no oxide of zinc or sulphate of lime in these gelatins.

The presence of so much water was quite unexpected; and as the quantity is nearly the same in fresh and in seasoned specimens, it is not a make-weight, although steam is very freely used in the rooms where glue is packed by the manufacturers. The carbonate of lime comes from the quick lime used for cleaning and preserving the animal matter, or glue stock, while the sulphate of lime is formed by the addition of small quantities of sulphuric acid during the process of manufacture, to neutralize the lime that is carried forward by the solutions of glue. The oxide of zinc is said to be added to prevent souring, or the acidity caused by decomposition, and it also improves the colour of the glue; but it is not very generally used, as these analyses indicate. I have heard of the use of sulphate of zinc, alum, magnesia, etc., by glue makers, but I did not find any other substance than those named above in these specimens, which represented the article commonly sold and used.

The impure glues, or those containing the most mineral matter, became almost insoluble after they had been broken into small pieces

and heated in a hot air bath (copper oven) at 212° Fah., for two or three hours, until they ceased to lose weight; they then soften and become dough-like, but do not dissolve when boiled in water for some time. The purer gelatins were not so much injured, and one specimen, containing only 2.56 per cent. of ash, was not materially affected by this thorough drying. The solid sheet glue, while drying in this way, tumefied, and became very porous; the frozen glue did not alter in structure.

The conclusions drawn from these experiments were that the excess of lime combines with the gelatin and, perhaps, with the extraneous animal matters of the glue, at the high temperature, forming a compound like lime soap, as the whole quantity of lime is retained in the insoluble portion left after boiling the dried glue in water. Such an explanation accounts for the difference noticed in the effect of drying upon gelatin and common glue.

PERCENTAGE YIELD OF EXTRACTS FROM MEDICINAL PLANTS.

Mr. Dankwortt, chairman of the committee of the *Meurer's-Prize*, reports in the February number of the *Archiv der Pharmacie*, that the first prize had been awarded to the apprentice Otto Wick, for the following table, in which he has given the average amount of extracts obtained from the respective plants when following the directions and processes of the *Pharmacopœa Germanica*:

Extractum Aurantii Cortices.....	30	per cent.
Belladonnæ.....	3.5	"
Calumbæ.....	10.5	"
Centaurei	24.	"
Chamomillæ	25.	"
Chin: fusc: frig: par:	12.	"
Conii	3.	"
Digitalis	4.	"
Ergotæ	16.	"
Graminis.....	26.	"
Hæmatoxyli	11.5	"
Hyoscyami	3.	"
Liquiritiæ Radicis.....	30.	"
Millefolii	25.	"
Myrrhæ	50.	"
Pulsatillæ	4.5	"
Quassiæ	5.	"
Sabinæ	23.	"
Senegæ	24.	"
Stramonii	3.	"
Valerianæ	24.	"

—Chicago Pharmacist.

WHAT IS "ANGELICA-ROOT?"*

BY ADOLPH W. MILLER, M. D., PH. D.

When a pharmacist orders "angelica-root," what does he expect to receive? As the answers to this query showed the existence of a wide difference of opinion among botanical druggists and others, an inquiry into the subject may possibly be productive of great uniformity. The attention of the writer was first directed to the matter in a rather mortifying manner by a compounder of liquors, who had inadvertently obtained, along with a number of other ingredients, a pound of ground American angelica-root, in place of the European, which he had been in the habit of using. According to the statement of this party, a whole barrel of his bitters had been totally spoiled by it, so that it was rejected by all of his customers, on account of its peculiar and, to them, disagreeable flavor. The root in question had been obtained in the ground state from a New York drug mill, and, on being applied to, the proprietors insisted that there was no error whatever on their part, but that the correct article had been sent.

The "Pharmacopœia Germanica" gives *Archangelica officinalis*, Hoffmann, as the plant furnishing the officinal *Radix Angelicæ*. In the old editions of the "U. S. Pharmacopœia," our indigenous species *Angelica atropurpurea* (or *Archangelica atropurpurea*, Hoffm.) was recognized in the secondary list. The edition of 1860 dismissed the species, and substituted the European *Angelica Archangelica*, now named *Archangelica officinalis* by Hoffman. The present edition has rejected both plants, so that we cannot appeal to its authority on this point.

The search for an authentic specimen of American angelica-root revealed the somewhat surprising fact, that at least three or four different roots are sold under that name. One of our Southern friends, who kindly favoured us with the pressed leaves, as well as the root of what he considered the true *Archangelica atropurpurea*, informed us at the same time he has reason to believe the root of *Ligusticum actæifolium* to be sometimes substituted. The leaves and umbellets of his own specimen, however, vary materially from those of *Archangelica atropurpurea*, while they agree with the botanical description of the *Ligusticum actæifolium*. The flavour and odour of his roots, also, very closely approach those of the European loveage, *Ligusticum levisticum*. One of the popular synonyms for this American loveage is Angelico, certainly a very near approach to angelica; and this may, in part, account for the error. According to Gray, the *Archangelica atropurpurea* is not even met with south of Pennsylvania.

* Read at a meeting of the Philadelphia College of Pharmacy, and published in the Am. Jour. of Pharm., May, 1875.

Another variety of the commercial angelica-root, obtained from a very respectable source, bears a close resemblance to the American spikenard, *Aralia racemosa*. It is most probably the root of the *Aralia spinosa*, which is known in many sections as the angelica-tree.

The popular name of masterwort is an additional cause of confusion. The "U. S. Dispensatory" applies this word to three different plants: *Angelica atropurpurea*, *Heracleum lanatum* and *Imperatoria ostruthium*. As only the latter of these is of European origin, there can be little doubt that it is the proper root to dispense, when called for by Germans under the name of *Meister wurzel*. Regarding the two former, one of our botanical establishments admitted occasionally sending out either one indiscriminately, though the name masterwort is more generally understood to apply only to the *Heracleum* or cow-parsnip.

The frequent substitution of these roots for each other is no doubt to be partially attributed to the fact, that they all agree in being highly aromatic, and in possessing a warm, pungent taste. All of them are members of two very closely related families, the *Umbelliferae* and the *Araliaceae*. There is, however, so striking a difference in the physical properties of these commercial angelicas and the true cultivated *Archangelica officinalis*, that the recognition of the latter presents no difficulties. Its odor and taste are quite peculiar, and altogether different from those of any of the substitutes; its colour is also rather darker and more brownish. The most marked characteristic is the great abundance of very numerous, descending, wrinkled fibres, many of them several inches in length. In this respect it differs entirely from the American specimens, all of which are simple roots, not furnished with radicles.

To revert to the original question: Which is the proper root to dispense, in the absence of specific directions? Most of the trade catalogues of our botanical druggists and fluid-extract manufacturers describe angelica as being obtained from *Angelica atropurpurea*. It has been shown, that, owing to the lack of botanical knowledge on the part of the collectors, and, perhaps, also to other causes, those who purchase this are quite as likely to receive some substitute as the true root; while the cultivated species can be readily obtained free from adulterations. When *Engelwurzel* and *angelique*, or *racine de Saint Esprit* are asked for, the European or garden angelica is evidently wanted. When used as a flavoring ingredient for liquors or cordials, it is equally certain that the peculiar flavor of the *Archangelica officinalis* is desired, as most of the recipes for bitters and gins, in which it is used, have originated in Europe. As has been already stated, *Archangelica officinalis* is the only species recognized in the "German Pharmacopœia," and the same root was officinal with us during the previous decade. Angelica is in reality used to a much greater extent by our foreign than by our native-born popula-

tion. The consumers are almost invariably unaware that there is more than one variety, and they consequently ask simply for angelica, as the English name is given by their respective dictionaries. In consideration of these facts, it is, in the opinion of the writer, by far the safest to give the imported species, whenever there is any doubt. In order to avoid occasional annoying errors, pharmacists may find it advantageous, in ordering, to indicate definitely which variety they desire, and to label their packages accordingly. If the full botanical names are found to be too unwieldy for daily use, the two drugs may be neatly and conveniently distinguished by the adjectives, European and American.

Philadelphia, April 19th, 1875.

MANUFACTURE OF EXTRACT OF INDIGO.*

To make what is generally called sour extract of indigo, mix 5 lbs. of best Bengal indigo in 30 lbs. of strong oil of vitrol. Let it stand five days; then put it in a tub and add 40 gallons of boiling water to it; then filter while hot through strong felt cloth. The filters are usually made this way: A frame like a table top, 8 yards long, 2 yards wide. This frame is divided in four filters. Pieces of wood across are put on the top and made to fit the holes (the shape of bowls, with small holes perforated in them); then the felt cloth is put on the top, and the liquid is put on the filter and filtered through. The sediment at the top is used to color pottery moulds; that which runs through is put in a tub, and 40 lbs. of common salt added. Digest for six hours; then put on the filters again for four or five days. That which drains through runs away into the sewers; that on the top of the filters is the extract. For these proportions the extract should weigh 80 lbs. This is sour extract of indigo of commerce.

FREE EXTRACT.

To make free extract of indigo, put 100 lbs. of the sour extract in a tub, 12 gallons of water as well. Neutralize the acid in the extract with strong soda ash liquor until it is free from any sour taste: then put on the filters for six days. It should weight 100 lbs. when it comes off. That is free extract of indigo of commerce.

* Chemical News.

Editorial.

THE APPROACHING ELECTION OF COUNCIL.

The term of office of the present Council will expire on July 7th, and it is now time that the preliminaries of the coming election be entered upon. According to the by-laws of the College, nominations may be made one month before the election, and must be received by the Registrar at least fourteen days before the expiration of that time. This period will therefore extend from June 7th to the 22nd. In case the nomination is declined, the Registrar must be so informed before June 27th; and in case of no answer being received he may conclude that candidates consent to stand for election.

The election will take place on Wednesday, July 7th, and all voting papers must be mailed so as to be received by the Registrar by noon of that day.

The list of members who have paid their fees for the current year—and who are, therefore, entitled to keep open shop and be considered members “in good standing”—will be closed on June 14th so as to be issued on the day following, as required by law. This list will embrace the names of all those who are entitled to vote, or to be elected.

In accordance with a resolution passed at the last meeting of the Council, we again urge upon the electors the advisability of selecting representatives from different parts of the Province, so as to distribute the representation as equally as possible, and with this view we also publish a scheme for the division of Ontario into electoral districts. In submitting this division we would say that the principle of “representation by population” has been adopted, the numerical strength of the druggists in the various groupings being as nearly equal as possible. The Province has been partitioned off into thirteen divisions corresponding with the number of members in the Council. As some of the divisions contain several counties and two or more chief towns, it has been thought better to designate the districts by numbers :

PROPOSED DIVISION OF ONTARIO INTO ELECTORAL DISTRICTS.

NAME OF DIVISION.	COUNTIES.
<i>First District</i>	{ Glengary, Prescott, Stormont, Russell, Dundas, Carleton, Grenville, Lanark, Renfrew.
<i>Second</i> "	{ Leeds, Frontenac, Lennox, Addington, Prince Edward, Hastings.
<i>Third</i> "	Northumberland, Peterboro', Durham, Victoria.
<i>Fourth</i> "	Ontario, York, Peel, Halton.
<i>Fifth</i> "	City of Toronto.
<i>Sixth</i> "	Simcoe, Muskoka.
<i>Seventh</i> "	Grey, Bruce, Huron.
<i>Eighth</i> "	Cardwell, Wellington, Perth.
<i>Ninth</i> "	Wentworth, Brant.
<i>Tenth</i> "	Welland, Monck, Lincoln, Haldimand, Norfolk.
<i>Eleventh</i> "	Oxford, Waterloo.
<i>Twelfth</i> "	Middlesex, Elgin.
<i>Thirteenth</i> "	Kent, Essex, Bothwell, Lambton.

Editorial Summary.

NEW SUBSTITUTE FOR DOVER'S POWDER.—A writer in the *Archives of Electrology and Neurology* recommends, in the strongest terms, the following powder, which, when taken in time, has been found of great value in breaking up colds, and in modifying their force when taken at a later period :

Camphor, five parts. Dissolve in ether to the consistence of cream. Then add carbonate of ammonia, four parts ; opium-powder, one part. Mix and keep in a tightly-corked bottle. The dose is of course regulated by the opium, and ranges between three and ten or fifteen grains. We have been accustomed to prescribe it for our friends by the finger-nail full, or as much as one can put on the finger-nail. This powder may be taken in a little water just before retiring, by preference, or at any hour of the day, whenever there is a suspicion of having caught cold. If need be, a moderate dose may be taken several days in succession. The advantages of this powder are very great. 1. The taste is agreeable, or at least is not disagreeable. Even the bitterness of the opium is mostly neutralized by the camphor and ammonia. No child objects to this powder. 2. It is singularly and inexplicably efficacious. We believe it to be more efficient than Dover's powder, and incomparably more agree-

able. In some cases it produces a gentle perspiration; in others, this special effect is not observed. It is so easy to take, and so harmless in small doses, that it is well and safe to take it whenever we become badly chilled.

ALCOHOLIC TINCTURE OF PHOSPHORUS.—From a series of experiments performed by Mr. R. H. Cowdrey, and reported in the *Chicago Pharmacist*, the following conclusions are drawn:

1. Alcohol of sp. gr. 0.822 dissolves, at common temperatures, 0.25 per cent. of phosphorus, equal to 0.93 grains in each fluid ounce. Alcohol sp. gr. 0.835 dissolves, at common temperatures, 0.18 per cent. of phosphorus, equal to 0.64 grains in each fluid ounce. Glycerin sp. gr. 1.29 dissolves 0.17 per cent. of phosphorus, equal to 0.12 grains in each fluid drachm, or 0.96 grains in each fluid ounce. 2. Phosphorus in alcoholic solution undergoes oxidation when in contact with air; light has a tendency to facilitate oxidation, therefore it should be protected as much as possible from the light, dark coloured bottles being preferred for its keeping. 3. When an excess of phosphorus is kept in the tincture, the fluid will always contain practically the same amount of free phosphorus; phosphoric acid, on the contrary, will vary in amount with the exposure of the tincture. 4. The liquid is precipitated by aqueous liquids, but mixes in all proportions with glycerin. 5. The tincture is best prepared as follows: Take of phosphorus, scraped clean, one stick; commercial alcohol, thirty-two fluid ounces. Allow to remain in contact a week at least, at medium temperature, and decant as needed, and keep in the dark or in dark coloured bottles.

PREPARATION OF MONOBROMATED CAMPHOR.—Mr. J. U. Lloyd contributes to the *American Journal of Pharmacy* the following process for the preparation of this compound:—Into a half gallon tubulated retort introduce fourteen avoirdupois ounces of powdered camphor, and pour upon it by fractions eight avoirdupois ounces of bromine—agitating after each addition, then add ten fluidounces of warm distilled water, and place the retort upon a sand-bath, allowing the neck of the retort to project into a flue or the open air, that the hydrobromic acid which forms may escape. Now apply heat until the liquid within the retort boils, and continue the boiling until the water is about driven off—to accomplish this will require nearly two hours—and then the contents of the retort will be of a deep amber color, almost transparent; the ebullition will be attended with violent splashing and bumping. The heat must now be discontinued and the retort allowed to cool somewhat, when its contents are

poured into a dish and agitated with sixteen fluidounces of warm alcohol, and allowed to remain about twelve hours in a cool place to crystallize. The mass of fine crystals are now to be separated from the liquid by filtration, and purified by dissolving them in sixteen ounces of hot alcohol, and recrystallizing, which operation must be repeated if they are still colored.

ESSENTIAL OIL OF CHERRY LAUREL.—Dr. W. A. Tilden contributes to the *Pharm. Jour. & Trans.* a paper on this subject. After alluding to the common belief that the oil of cherry laurel and that of bitter almonds are identical in composition, the writer describes some experiments made with a view of determining this point. A considerable quantity of the oil—about two and half ounces—was operated upon, and the conclusion arrived at is that the essential oil of cherry laurel leaves consists mainly of benzoic aldehyd, accompanied with hydrocyanic acid (about two per cent.); volatile oil, possibly benzoic alcohol (perhaps one per cent.); and minute quantities of an odorous resin. The oil experimented upon was obtained by the distillation of the leaves in an operation for *Aqua Lauro-Cerasi*, and the quantity above named represented that portion which separated from the destillate from 300 pounds of leaves.

MUCILAGE FOR MINERALOGICAL SPECIMENS.—Mr. F. C. Hill sends to the *American Journal of Pharmacy* a recipe for mucilage to mend fossils and minerals. The cement is described as invaluable, being very adhesive, never becoming brittle or scaling off, and answering well for gumming labels, &c. Starch, two parts; white sugar, eight; gum arabic, sixteen parts; water, sufficient. Dissolve the gum, add the sugar and starch, and boil until the starch becomes transparent.

THE ALKALOIDS AND ACIDS OF SANGUINARIA CANADENSIS.—In an inaugural essay, Mr. Lewis C. Hopp, Graduate of the Philadelphia College of Pharmacy, (*Am. Jour. Pharm.*) gives the details of experiments as to the active principle or principles contained in *Sanguinaria Canadensis*. After the separation of sanguinarina as a sulphate, the ethereal washings of the alkaloid were treated for puccina, after the process of Mr. Wayne, but according to Mr. Hopp, who isolated this supposed principle, "puccina is nothing more than sanguinarina, with some resin and coloring matter per-

sistently adhering to it." We are also informed that sanguinarinic acid has no existence as a definite body, but consists of a mixture of citric and malic acids.

PREPARATION OF LIQ. POTASSII CITRATIS U. S. P.—Mr. Aug. Hohe, (*Am. Jour. Pharm.*) alludes to the difficulties attending the keeping of this solution, and proposes the following formula which is said to furnish a preparation to which no objection can be taken. The quantities are double those of the *U. S. Pharmacopœia*. Citric acid, one troy ounce; distilled water, eight fluid ounces; dissolve and filter. Bicarbonate of potassium, eleven drachms; distilled water, eight fluid ounces; dissolve and filter. Two solutions are thus obtained ready for use; and the liquor may be at once prepared by a mixture of equal parts of each; time and space being allowed for effervescence.

POISONOUS EFFECTS FROM THE INHALATION OF THE POWDER OF PHYTOLACCA DECANDRA.—Mr. C. W. Cressler, (*Amer. Journal Pharm.*) gives instances of three cases of poisoning referable to the influence of the dust of poke root, inhaled during the powdering of four or five pounds of the root. Severe vomiting and purging resulted, following pain and soreness of the motor muscles, chill and high fever; the mucous membrane of the throat, nose, and eyes was much affected. Recovery in about forty-eight hours. The author thinks that had the quantity of the root, or the exposure to its influence been greater, serious consequences would have resulted.

Students' Department.

Answers to the following questions must be sent in so as to be received by the editor before the twentieth of each month. Competitors must be engaged in the drug business, not being proprietors or having passed examination, and must furnish, with the answers sent, their real names and addresses. Answers to each of the questions must be written on *separate sheets* or slips of paper, and must be followed by the name and address of the competitor. It is trusted that all answers sent will be the *bona fide* work of competitors, and that no assistance will be sought except such as is afforded by books. Any attempt to copy *verbatim*, or in part, from any published work, will impair or altogether nullify any value which might otherwise have been assigned to such answer.

The same competitor may not carry off more than one First Prize and one Second Prize during the term of six months.

Answers requiring calculation and involving fractions must be given in decimals, which need not be carried beyond the third place.

The following books are offered this month as prizes:

FIRST PRIZES.

PARRISH'S *Pharmacy*.
 GARROD'S *Materia Medica*.
 GRAY'S *Manual of Botany*.
 FOWNES' *Chemistry*.
 ATTFIELD'S *Chemistry*.
 SQUIRE'S *Companion to the Pharmacopœia*.
 BENTLEY'S *Manual of Botany*.
 REDWOOD'S *Supplem't to the Pharmacopœia*.

SECOND PRIZES.

GRAY'S *First Lessons in Botany*.
 WITTSTEIN'S *Pharmaceutical Chemistry*.
 ROSCOE'S *Chemistry*.
 PAREIRA'S *Selecta e Præscriptis*.
British Pharmacopœia.
U. S. Pharmacopœia.
 KAY-SHUTTLEWORTH'S *Principles of*
Modern Chemistry.
 PRESCOTT'S *Proximate Organic Analysis*.

Successful competitors may select from any of the above works, and, on notifying the Editor, the book selected will be forwarded by post.

All communications to be addressed, E. B. SHUTTLEWORTH, Box 517, Toronto.

QUESTIONS.

1. *Chemistry*. (a)—If 10 ounces of water, temperature 212° F., be quickly agitated with 10 ounces of olive oil, temperature 40° C., what will be the temperature (centigrade) of the resulting mixture? (b) What is the temperature of water boiling in a closed vessel in which the pressure of the confined vapor equals that of ten atmospheres? (c) Describe the method of estimating the specific gravity of a solid, as potassium.

2. *Pharmacy*.—Describe the main points of difference between the British and U. S. officinal methods of conducting the process of percolation; state the advantages or disadvantages attending each.

3. *Materia Medica*.—Enumerate and give the doses and medical properties of the acids and metallic salts of the British Pharmacopœia.

4. *Botany*. (a)—Give the leaves officinal in the B. P.; name the plants to which they belong, and give the class, order, tribe, genera and species. (b) Give office of starch deposited in seeds, and state the difference in this deposit in the bean and corn.

5. *Dispensing*.—If there be no dilute hydrocyanic acid in stock, how may it be speedily prepared? Explain the process by a chemical formula.

6. *Prescriptions*.—What are the errors in the following prescription:

Recipe—Tinct. Digital, ζ ij.
 Liq. Arsenical, ζ ss.
 Acid Carbohc, ζ ij.
 Liq. Strych., ζ iss.

Tinct. Ferri Mur, ʒijj.
 Spts. Ammon Ar, ʒiij.
 Aquæ ad, ʒviiij.
 Sig. Coch. mag. ter in die.

ORDER OF MERIT.

Maximum Number of Marks = 60.0.

No.	NAME.	Chem-istry.	Phar-macy.	Materia Medica.	Botany.	Dis-pens-ing.	Pre-scrip-tions.	Total.
1	W. W. Stephen, Meaford	10	9	9.0	10.0	10	10	58.0
2	E. F. Stephenson, Cobourg	9	10	6.0	9.0	8	6	48.0
3	"Competitor," Renfrew.....	3	9	10.0	9.0	10	6	47.0
4	H. C. Goodman, St. Catharines	10	8	6.0	7.0	8	6	45.0
5	H. J. Thompson, Strathroy	10	2	10.0	8.0	6	6	42.0
6	"Ferri," London.....	8	8	5.0	10.0	6	4	41.0
7	J. H. Mackenzie, Mt. Forest	3	8	8.0	5.0	6	10	40.0
8	J. Douglas, Owen Sound	9	6	4.0	6.0	6	9	40.0
9	J. C. Cooke, Kincardine	9	3	9.0	4.0	7	6	38.0
10	"Capsicum," Port Hope	9	7	5.0	7.0	6	4	38.0
11	R. T. Geary, Sarnia	2	7	9.0	6.0	6	8	38.0
12	R. G. Scott, Sarnia.....	2	7	8.0	4.0	5	5	31.0
13	H. Jarmuth, Mitchell.....	2	4	3.0	10.0	7	5	31.0

The first prize is awarded to Mr. W. W. Stephen, Meaford; the second prize to Mr. E. F. Stephenson, Cobourg.

Books and Pamphlets.

Outlines of Proximate Organic Analysis, for the Identification, Separation, and Quantitative Determination of the more commonly occurring Organic Compounds: By Albert D. PRESCOTT, Professor of Organic and Applied Chemistry in the University of Michigan. New York: D. VAN NOSTRAND, 1875. 12mo. pp. 192.

The author of this work has been exceedingly fortunate in his selection of a subject inasmuch as his choice has fallen upon a department of knowledge, which, at least as far as English literature is concerned, has been almost totally neglected. It has not been that the want of information on proximate analysis has not been recognized, and, indeed, severely felt, but, until the present, the field

has been unoccupied, save by disconnected and incomplete references to be met with in chemical and pharmaceutical treatises, and fragmentary items appearing in the scientific journals. The work before us comes, therefore, very opportunely, and, if we mistake not, will be found well deserving of the welcome which it will be sure to receive.

From a somewhat careful inspection of this little volume we conclude that it will be of much service to the pharmaceutical inquirer and student. Its contents are well arranged, its range comprehensive, and its style concise. As a general classification we have the following enumeration:—Preliminary Examinations, Solid Non-Volatile Acids, Solid Volatile Acids, Liquid Non-Volatile Acids, Liquid Volatile Acids, Fatty Acids, liquid and solid; Bases, liquid and solid; Glucosides and other solid Neutral Substances, Nitrogenous Neutral Bodies, Carbohydrates, Alcohols and their products.

As an instance of the general scope of these divisions we may take up that treating of "Bases," and passing on we come to the class of "Alkaloids," which are all enumerated, their special characters described, and their reactions given. The solubilities of the alkaloids in water, fixed alkali with water, ammonia with water, benzole, amylic alcohol, ether, and petroleum naphtha, chloroform, chloroform with acid, petroleum naphtha with acid, benzole with acid, and amylic alcohol with acid are given in a tabular form which will be very useful for reference. The separation of alkaloids from solid albumenoid, fatty and extractive matters is also described; and the separation of the alkaloids from each other is treated in a very thorough manner—the methods of Otto and Stas, Uslar and Erdmann, Rodgers and Girdwood, Dragendorff, with others being separately given in detail. This is followed by a description of the various processes for quantitative and volumetric estimation, and of the behavior of the alkaloids with the more prominent reagents.

We cordially recommend this work as one of the most useful a pharmacist can have upon his shelves.

Chemical Examination of Alcoholic Liquors. A Manual of the Constituents of the Distilled Spirits and Fermented Liquors of Commerce, and their qualitative and quantitative determination. By Alfred B. PRESCOTT, M.D., Professor of Organic and Applied Chemistry in the University of Michigan. New York: D. VAN NOSTRAND, 1875. 12mo. pp. 108.

The design of this work is stated to be, firstly, to place in out-

line the chemistry of alcoholic liquors, including their current impurities and adulterations in such terms as to be understood by persons having only an ordinary acquaintance with chemical science. Secondly, to furnish directions, as far as possible, for an efficient chemical examination, not more elaborate than required for commercial, hygienic, and legal purposes, and containing all details except such as are found in the first books of chemical analysis.

In fulfilling and perfecting this design the author has succeeded admirably, nor has any opportunity been lost in taking advantage of and placing permanently upon record the numerous facts and suggestions relating to adulterations which have from time to time appeared in the periodical scientific literature of the day. The work has been brought up to the latest date, and, in this respect, as well as others, is superior to *Griffin's Testing of Wines and Spirits*—a book of similar design and scope, which we think may be advantageously superseded by Mr. Prescott's Manual.

A Series of American Clinical Lectures. Edited by E. SEGUIN, M.D. New York: G. P. PUTNAM & Sons. Vol. I, No.'s 2 and 3.

The second number of this new publication contains a lecture on Acute Rheumatism in Infancy and Childhood, by A. Jacobi, M. D. The lecture was delivered in the amphitheatre of Bellevue Hospital, February, 1875. The following number gives another clinic on Pneumo-Thorax, by Austin Flint, M.D. The names of these lecturers are a sufficient guarantee of the character of the publication, which, we doubt not will prove a useful and successful addition to medical literature.

The Present Status of Electricity in Medicine. By William F. HUTCHINSON, A.M., M.D. Providence, U.S., 1875.

This pamphlet contains the substance of an address delivered before the Rhode Island Medical Society.

Obituary.

DANIEL HANBURY, F.R.S. ETC.

For the following biographical sketch we are indebted to the *Pharmaceutical Journal and Transactions*:—

By the sudden death of Mr. Daniel Hanbury in the prime of life, pharmacology and the allied sciences in their relation to pharmacology have lost one of their most assiduous and successful students, and deep will be the sense of personal loss of very many engaged in the same studies both at home and abroad. As a frequent contributor to this Journal the character and value of his work has long been known to our readers, and the following particulars of his life, though unavoidably fragmentary, will we read with interest.

Daniel Hanbury was born 11th September, 1825. He was the eldest child of Daniel Bell Hanbury, who for many years was a valued member of the Council of the Pharmaceutical Society, and for eleven years its Treasurer. In early life he showed superior ability. At school he always maintained a foremost place, and attained a considerable degree of proficiency in classical studies, and also in water-colour drawing.

In the year 1841 he commenced his business training under the firm of Allan, Hanburys and Barry, of which his father was an active member. Here his peculiar abilities were speedily manifested and appreciated.

His innate love of precision and accuracy were stimulated by the example and influence of Mr. Barry; he became an exquisitely neat experimenter, and his hand-writing assumed the form which those familiar with it will never forget, combining in a singular degree, firmness, force of character, and complete accuracy of detail. Whatever he undertook was done with uncompromising thoroughness. He never spared himself any labour, nor sought the notice of those around him by talking of any effort he made, but quietly brought his fine abilities to bear with painstaking conscientiousness on the one matter immediately before him, whether dispensing a prescription, posting an account book, or writing a scientific paper. With such qualities he not only accomplished a very large amount of work, but the quality of what he did was almost faultless.

In the year 1844 he studied at the laboratory of the Pharmaceutical Society.

His pursuits early brought him in contact with the late Dr. Pereira who treated him with great consideration, and a warm friendship sprang up between the professor and his pupil, which lasted till the death of the former, and the remembrance of which

has since often been manifested by Mrs. Pereria. His first contribution to this Journal was we believe on "Turnsole," in January, 1850. From that time to the present his papers are scattered thickly through our volumes, numbering, according to the index, sixty-one, the last being incorporated in an article entitled "Cinchona or Chinchona," published on the 13th of February in the present year.

The series of papers on Chinese Materia Medica, published in the years 1860-1-2 were highly esteemed by those most capable of appreciating them and afford a characteristic example of accurate and careful research.

He never wrote without having original information to impart and his papers uniformly bear evidence of careful investigation and thorough knowledge.

Most happily the work upon which he had been engaged for many years in conjunction with Professor Fluckiger, the 'Pharmacographia,' was completed and published last year. This work is a storehouse of reliable information to which future generations will have recourse, and it is by his part in this important work that he will hereafter be best known. No one can read the historic sections of the book without being struck by the vast variety and extent of reading to which they bear witness.

Narratives of travels were especially attractive to him. He took nothing at second hand, but always sought his information from the fountain head. His library contained many Latin volumes of the early Portuguese, Dutch and Spanish voyagers, to which he constantly referred, and he eagerly read modern books of travel likely to throw light on his favourite studies.

Whilst alluding to his writings we must not omit to mention the important part he took in the preparation of the Pharmacopœia of India, a work involving much labour. He was also one of those deputed to draw up the Admiralty manuel of scientific inquiry. Botany was the science to which he especially devoted his attention. He contributed to the *Transactions of the Linnean Society* the following papers, "Note on Cassia Moschata," H. B. et K., xxiv. 161; "On the species of Garcinia which affords Gamboge in Siam" (G. Morella), xxiv. 487, and with Mr. Currey, "Remarks on Sclerotium Stipitatum and Similar Productions," xxiii. 93; and numerous papers by him will be found in the *Journal of the Linnean Society*.

We believe he has collected a large mass of original information for a monograph on an important genus, and trust it may yet be given to science.

Occasionally he contributed an article to the literary periodicals. A paper containing curious information on Frangipani in *Notes and Queries*, and another on the botanical origin and country of Myrrh, published in *Ocean Highways*, for April, 1873, will be remembered by some of our readers. He occasionally contributed to the *Athenæum*, and a review of "The Countess of Cinchon and the Cin-

chona Genus" is about to appear in the *Academy*. He served on the juries of the International Exhibitions in 1862 and in 1867, and in the former year acted as secretary to the jury on vegetable products, the proceedings of which were conducted in French. In the year 1855 he was elected a Fellow of the Linnean Society, repeatedly served on its Council, and held the office of Treasurer at the time of his death.

He was also a Fellow of the Chemical Society, and Member of its Council in the year 1869.

In the year 1867, on his first nomination, he was elected a Fellow of the Royal Society, and a Member of its Council in 1873.

Of the Pharmaceutical Society he was a warm supporter almost from its origin. For many years (from June 1860, to May, 1872,) he rendered very valuable services as an examiner, often at great personal inconvenience, and he was a very constant attender of the evening meetings, to the usefulness of which he often contributed.

In 1870 he retired from business. He never married, but lived with his parents, to whom he was a most kind and affectionate son. Though possessed of ample means, his habits, we believe, both from principle and taste, were remarkably simple and inexpensive. He disliked and shunned everything approaching ostentation, and luxury and self-indulgence were utterly alien to his life. He was always an early riser, and habitually got through an important amount of work in his library before breakfast, and few indeed were the moments wasted from early morning until he again retired to rest.

Travelling on the Continent was one of his greatest pleasures. He read German. He had some knowledge of Italian, but he spoke French almost as a native, and hence travelling in France was specially attractive to him. It was not only in Paris, where the late Professor Guibourt and other scientific friends always gave him a warm welcome, but in the provincial towns and in the cities of the South wherever there was a botanist of standing he found an open door and often gained an acquaintance who became a valued correspondent able to afford local or other special information.

But his journeys were not confined to France. In the year 1860 he visited the Holy Land with Dr. Hooker, and of late years he frequently spent considerable time at a residence belonging to a brother near Mentone. Here he took great delight in introducing into the beautiful gardens the vast variety of interesting plants which can there be acclimatized.

During these journeys he frequently exercised his skill in water-colour drawing, and the production of his pencil, like those of his pen, always possessed the rare merit of *truthfulness*, whilst a thoroughly artistic effect was preserved. The same exquisite delicacy of touch was apparent in his drawing, writing or printing, or forming of Arabic, Chinese, or other complicated characters.

In his frequent travels he seemed to have acquired something

of the continental practice of using but little meat in proportion to the vegetable food taken. His diet was always spare, and it may be doubted whether his health did not suffer from the abstemiousness of his habit of living, coupled with the constant strain to which he subjected his mental powers. But if this was so the motive was never the gratification of ambition or other unworthy object, but the pure love of action and desire to rightly use the powers bestowed upon him. No feature of his life was in fact more striking than his freedom from that anxious self-assertion which too often disfigures the characters of men of science. Whilst remarkably self-reliant, he never sought to thrust himself into notice, but rather kept out of view until drawn out by those who had learned his worth. Though never robust, his health rarely impeded his activity, and slight ailments were resolutely disregarded. There were no indications of approaching illness until he was attacked with a severe *rigor* about the 6th of March; this was followed by serious inflammation of the mouth, and on the subsidence of this local affection symptoms of typhoid fever appeared. On the 18th his condition first caused serious alarm. With little apparent change his strength gradually failed till the evening of the 24th, when he peacefully passed away.

Long will the memory of his fine, thoughtful features and spare frame dwell with many who have known and valued him, and long will they continue to miss the decided tones in which his clear judgment and exact knowledge were unhesitatingly expressed. With him every benevolent object connected with science or scientific men has lost a munificent supporter.

Mr. Hanbury remained to the last a member of the Society of Friends, amongst whom he had been brought up. With characteristic reticence he scarcely ever alluded to his own religious experience, but his habits of devotion, and an occasional expression, afford evidence of the reality of his Christian faith.

That a man thus endowed with talents both natural and acquired should be taken away ere he completes his fiftieth year, is to us an inscrutable mystery. The light of eternity alone can reveal the full significance of any life.

Varieties.

PURIFIED EXTRACT OF LICORICE.—In a notice on the preparation of this article, E. Ungewitter states that, by digesting stick-licorice in 90 per cent. alcohol, a resinous constituent of a disagreeable acrid taste is removed and the resulting extract (obtained with cold water) has an agreeable, purely sweet taste.—*Arch. d. Pharm. in Am. Jour. Pharm.*

TO EXTINGUISH THE FLAME OF BURNING PETROLEUM.—C. Ommeganck

found chloroform to be well adapted. one-twentieth and even one-sixtieth of the volume of the burning petroleum being sufficient for the purpose, and the effect being almost instantaneous. If petroleum is mixed with one-fifth its volume of chloroform, it is not inflammable by ordinary means. The author believes that petroleum fires may thus be readily extinguished in the beginning, and suggests that ships. &c., loaded with this article, should also carry a certain quantity of chloroform for the purpose indicated. —*Four. de Phar. d' Anvers*, March, 1874, in *Jm. Jour. Pharm.*

TO REMOVE STAINS FROM MARBLE.—Different processes are resorted to, according to the kind of blemish. *Ink* or *rust stains* are best removed with a weak solution of oxalic acid. *Grease stains* are taken out by the application of a paste or magma of common clay and benzine. A dilute solution of ammonia is recommended for erasing *copper stains*, and spots caused by *matches* can be extracted by sulphide of carbon. (2) A simple method of polishing marble, near a soda-fountain, for instance, is to rub it first with a flat and smooth piece of pumice-stone, and afterwards with dry putty-powder, applied with soft rags or chamois leather. (3) To silver over again parts of plated soda-fountains, where the metallic coat is more liable to become worn out from frequent use, the following is found to be quite satisfactory :

SILVERING SOLUTION.

Nitrate of silver, crystallized.....	1 ounce.
Cyanide of potassium	2 ounces.
Distilled water	12 “
Precipitated chalk	2 “

Dissolve the nitrate and the cyanide separately, mix the solutions, and add the chalk. The liquid is applied with a soft piece of linen, the place is well washed with water, and the surface is dried and gently polished with chamois leather.—*Druggist's Circular*.

POCKET-GLUE :—

Glue.....	2 pounds.
Rock candy	1 pound.
Water	3 pints.

Melt, evaporate to the proper consistence, and pour into moulds. When dry it is very pliable ; it is applied by moistening the end with the tongue, and rubbing it on the paper.—*Druggist's Circular*.

CANTHARIDIN.—According to Galippe (*Four. de Pharm. et de Chim.*), acetic ether is a better solvent than chloroform for the extraction of cantharidin from the flies. He suggests the process of percolation, and the employment of two parts of acetic ether to one part of the powdered flies. He also recommends that the percolation be conducted at a temperature of about 95° F., which aids the solvent in its work of extraction. The acetic ether is recovered from the percolate by distillation, and the green fatty matter which envelopes the crystals of cantharidin is removed by spreading the residue upon filtering paper and washing the crystalline mass with bisulphide of carbon,* after which the crystals are further purified by resolution in acetic ether, passing through animal charcoal and set aside to crystallize.—*Pharmacist*.

JUTE.—The jute of commerce, which has of late years been largely used in the manufacture of carpets, matting, bagging, etc., is chiefly

obtained from two species of *Corchorus*; *C. capsularis* and *C. olitorius*. The plants belong to the order *Tiliaceæ*, of which the Linden or Button-wood tree is a representative in our latitude. They are natives of India, and are extensively cultivated in Bengal. The *C. capsularis*, that is the more valuable of the two, yields a fibre (the inner bark) sometimes twelve feet in length, which is strong and durable. Its liability to injury by moisture unfits it for the manufacture of cordage, and the difficulty with which it is bleached renders it unsuitable for making paper except of a coarse quality. But its value as a material for carpeting and such heavy fabrics has caused a vast trade to spring up. Nearly every producing country imports either jute, or gunny-bags made from it. Jute bags are used for the cottons of India and America, and for the spices, fruits and miscellaneous produce of other countries.—*Pharmacist*.

AN IMPROVED POULTICE—At a recent meeting of the Academie de Medicine, Paris, M. Le Fort read his report on a substitute for the ordinary linseed-meal poultice invented by M. Lelievre. It is prepared by saturating two superimposed layers of wadding with a solution of *Fucus crispus*, or Carrageen lichen, and drying them in a stove after they had been submitted to pressure. In this way a sheet of the consistence of cardboard is produced, a portion of which is cut off when wanted, and soaked in hot water for fifteen or twenty minutes; this swells it out and fills its tissue with a mucilaginous fluid. It has been tried in several of the hospitals, to the great satisfaction of both patients and attendants. It can be prepared in large quantities beforehand, and will keep for a long time without undergoing any alteration. MM. Demarquay, Gosselin, and Varneuil pronounce it to be far superior to the linseed poultice; it keeps moist for more than sixteen or eighteen hours; it does not slip, is inodorous, does not readily ferment, nor does it soil the linen or bed of the patient. The new poultice is destined to render great service in hospitals and ambulances and above all on board ship, where it is difficult to keep the linseed in a good state of preservation.

RED MARKING-INK.—According to Th. Wegler, egg albumen is diluted with an equal weight of water, rapidly stirred with a glass rod until it foams, and then filtered through linen. The filtrate is mixed with a sufficient quantity of finely levigated vermilion until a rather thick liquid is obtained, which is used for marking with a quill; the rear side is then touched with a hot flat iron, whereby the albumen is coagulated; the marking is affected neither by soap, alkalies, nor acids. The ink may be preserved for a long time, in well-corked vials, without depositing the vermilion.—*Four. Pharm—Pharm. Centr. Halle*.

INGENIOUS USE OF ANALYSIS.—A German chemist determines by chemical analysis the amount of water evaporated in a steam boiler.

By means of a standard solution of nitrate of silver, he first determines the quantity of chlorine in the feed water, and then the quantity of chlorine in the water of the boiler at two different times, several days apart. From the increased quantity of chlorides he calculates the amount of water evaporated. He recommends as a suitable normal solution of silver to dissolve 23.94 grains nitrate of silver in 1,000 cubic centimetres of distilled water. Each cubic centimetre of this solution will precipitate exactly five milligrammes of chlorine. To indicate the end of the reaction, when all the chlorine is precipitated, he employs the neutral chromate of silver, which produces with any excess of silver solution, a bright-red color.—*American Gaslight Journal*.

WHOLESALE PRICES CURRENT.—JUNE, 1875.

DRUGS, MEDICINES, &c.	\$ c.	\$ c.
Acid, Acetic, fort.	0 14	@ 0 15
Benzoic, pure	0 22	0 27
Citric	1 40	1 50
Muriatic	0 05	0 06
Nitric	0 11½	0 15
Oxalic	0 22	0 23
Sulphuric	0 03	0 05
Tartaric, pulv.	0 50	0 50
Ammon, carb. casks	0 22	0 24
" jars	0 23	0 24
Liquor, 88o.	0 25	0 28
Muriate	0 14	0 15
Nitrate	0 45	0 60
Æther, Acetic	0 45	0 50
Nitrous	0 40	0 42
Sulphuric	0 50	0 50
Antim. Crude, pulv.	0 15	0 17
Tart	0 55	0 65
Alcohol, 95 per ct.	Cash 1 97	2 07
Arrowroot, Jamaica	0 18	0 22
Bermuda	0 50	0 65
Alum	0 02½	0 03½
Balsam, Canada	0 33	0 38
Copaiba	1 10	1 15
Peru	3 40	3 75
Tolu	2 50	2 60
Bark, Bayberry, pulv.	0 20	0 22
Canella	0 17	0 20
Peruvian, yel. pulv.	0 35	0 50
" red "	1 60	1 70
Slippery Elm, g. b.	0 18	0 20
" flour, packets	0 28	0 32
Sassafras	0 15	0 18
Berries, Cubebs, ground.	0 20	0 25
Juniper	0 06	0 10
Beans, Tonquin	0 62	1 10
Vanilla	30 00	30 00
Bismuth, Alb	2 50	2 75
Carb.	2 65	2 90
Camphor, Crude	0 33	0 40
Refined	0 43	0 47
Cantharides	2 20	2 30
Powdered	2 30	2 40
Charcoal, Animal	0 04	0 06
Wood, powdered	0 10	0 15
Chiretta	0 23	0 30
Chloroform	1 10	1 55
Cochineal, S. G.	0 65	0 70
Black	0 85	0 90
Colocynth, pulv.	0 60	0 65
Collodion	0 70	0 80
Elaterium	oz 3 20	4 00
Ergot	0 70	0 75
Extract Belladonna	1 50	1 60
Colocynth, Co.	1 25	1 75
Gentian	0 50	0 60
Hemlock, Ang	0 60	0 95
Henbane, "	1 70	1 80
Jalap	5 00	5 50
Mandrake	1 75	2 00
Nux Vomica	oz 0 40	0 50
Opium	oz 1 60	
Rhubarb	5 00	5 50
Sarsap. Hon. Co.	1 00	1 20
" Jam. Co.	3 50	4 00
Taraxacum, Ang	0 70	0 80
Flowers, Arnica	0 17	0 25
Chamomile	0 32	0 40
Gum, Aloes, Barb. extra.	0 70	0 80
" " good	0 40	0 50
" Cape	0 16	0 20
" " powdered	0 20	0 30
" Socot	0 50	1 35
" " pulv	1 00	0 00
Arabic, White	0 50	0 60
" " powdered	0 60	0 75
" " sorts	0 24	0 30
" " powdered	0 42	0 50
" " com. Gedda	0 13	0 16
Assafœtida	0 40	0 42
British or Dextrine	0 13	0 15
Benzoin	0 35	0 75
Catechu	0 12	0 15
" powdered	0 25	0 30
Euphorb, pulv.	0 35	0 40
Gamboge	1 00	1 20
Guaiacum	0 45	1 00
Myrrh	0 50	0 85

DRUGS, MEDICINES, &c.—Contd.	\$ c.	\$ c.
Sang Dracon	0 60	
Scammony, powdered	5 50	6 00
" Virg.	14 50	—
Shellac, Orange	0 80	0 85
Gum, Shellac, liver	0 60	0 70
Storax	0 40	0 45
Tragacanth, flake	1 10	1 75
" common	0 53	0 65
Galls	0 22	0 30
Gelatine, Cox's 6d.	1 15	1 20
Glycerine, common	0 19	0 26
Vienna	0 26	0 28
Prices	0 60	0 75
Honey, Canada, best.	0 15	0 16
Lower Canada	0 14	0 16
Iron, Carb. Precip.	0 20	0 25
" Sacchar	0 40	0 55
Citrate Ammon.	1 40	1 50
" & Quinine, oz	0 52	0 55
" & Strychine	0 20	0 25
Sulphate, pure	0 08	0 10
Iodine, good	4 30	5 00
Resublimed	5 30	6 00
Jalapin	1 25	1 50
Kreosote	2 40	2 50
Leaves, Buchu	0 22	0 32
Foxglove	0 25	0 30
Henbane	0 35	0 40
Senna, Alex	0 27	0 60
" E. I.	0 14	0 20
" Tinneville	0 20	0 30
" Uva Ursi	0 15	0 17
Lime, Carbolate	5 50	—
Chloride	0 05	0 06
Sulphate	0 08	0 12
Lead, Acetate	0 15	0 16½
Leptandrin	oz 0 60	—
Liq. Bismuth	0 50	0 60
Lye, Concentrated	1 50	1 60
Liquorice, Solazzi	0 50	0 55
Cassano	0 23	0 40
Other brands	0 14	0 25
Liquorice, Refined	0 35	0 45
Magnesia, Carb.	1 oz. 0 20	0 25
" " 4 oz.	0 17	0 20
" Calcined	0 65	0 75
" Citrate	0 60	0 75
Mercury	1 50	1 60
Bichlor	1 80	2 00
Chloride	2 10	2 15
C. Chalk	0 60	1 00
Nit. Oxyd	2 10	2 25
Morphia Acet	4 15	4 25
Mur.	4 15	4 25
Sulph	4 30	4 40
Musk, pure grain	oz 25 00	—
Canton	0 60	1 20
Oil, Almonds, sweet	0 38	0 43
" bitter	14 00	15 00
Aniseed	4 00	4 25
Bergamot, super	7 75	8 00
Caraway	3 20	3 50
Cassia	2 00	2 25
Castor, E. I.	0 13½	0 15
" Crystal	0 22	0 25
" Italian	0 26	0 28
Citronella	1 05	1 15
Cloves, Ang	3 50	3 75
Cod Liver	1 25	1 50
Croton	1 75	2 00
Juniper Wood	0 80	1 00
" Berries	2 75	3 00
Lavand, Ang	oz 0 00	1 00
" Exotic	1 25	1 50
Lemon, super	3 80	4 00
" ord.	3 20	3 40
Orange	3 00	3 25
Origanum	0 65	0 75
Peppermint Ang	15 00	16 00
" Amer.	5 50	7 00
Rose, Virgin	8 50	8 75
" good	7 00	7 25
Sassafras	0 75	1 90
Wintergreen	5 25	5 50
Wormwood, pure	4 00	6 00
Ointment, blue	1 40	1 50
Opium, Turkey	8 00	8 25
pulv.	11 00	12 00

	\$ c.	\$ c
DRUGS, MEDICINES, &c.—Cont'd		
Orange Peel, opt.	0 30	0 36
" good.	0 12½	0 20
Pill, Blue, Mass.	1 40	1 50
Potash, Bi-chrom	0 18	0 20
Bi-tart	0 33	0 35
Carbonate	0 14	0 20
Chlorate	0 35	0 40
Nitrate	8 00	9 00
Potass um, Bromide	70	0 80
Cyanide	0 60	0 70
Iodide	3 80	4 00
Sulphuret	0 25	0 35
Pepsin, Boudault's	1 40	—
Houghton's	8 00	9 00
Morson's	0 85	1 10
Phosphorous	1 10	1 20
Podorhyllin	0 50	0 60
Quinine, Pelletier's	—	2 45
Howard's	2 25	—
100 oz. case.	2 22	—
25 oz. tin.	2 20	—
Root, Colombo	0 13	0 20
Curcuma, grd	0 12½	0 17
Dandelion	0 17	0 20
Elicampane	0 16	0 17
Gentian	0 08	0 10
pulv	0 15	0 20
Hellebore, pulv	0 17	0 20
Ipecac,	1 50	1 60
Jalap, Vera Cruz	90	1 15
Tampico	0 70	1 00
Liquorice, select.	0 12	0 13
powdered	0 15	0 20
Mandrake	0 20	0 25
Orris,	0 20	0 25
Rhubarb, Turkey	2 00	2 25
E. I.	0 75	0 90
" pulv	1 60	1 10
" 2nd	0 60	0 70
French	0 75	—
Sarsap., Hond	0 53	0 60
Jam	0 88	0 90
Squills	0 10	0 15½
Senega	1 10	1 10
Spigelia	0 25	0 30
Sal, Epsom	2 25	3 00
Rochelle	0 30	0 32
Soda	0 02½	0 03
Seed, Anise	0 13	0 16
Canary	0 15	0 16
Cardamon	2 00	2 10
Fenugreek, g'd	0 08	0 09
Hemp	0 06½	—
Mustard, white.	0 14	0 16
Saffron, American	0 75	0 85
Spanish	12 00	13 00
Santonine	7 25	7 50
Sago	0 08	0 09
Silver, Nitrate	Cash	14 85
Soap, Castile, mottled.	0 11	0 14
Soda, Ash	0 03½	0 05
Bicarb. Newcastle	5 75	6 25
" Howard's	0 14	0 16
Caustic.	0 05½	0 05½
Spirits Ammon., arom	0 35	0 35
Strychnine, Crystals	2 00	2 20
Sulphur. Precip	0 10	0 12½
Sublimed	0 03½	0 05
Roll	0 03	0 04½
Vinegar, Wine, pure.	0 55	0 60
Verdigris	0 35	0 40
Wax, White, pure	0 70	0 80
Zinc. Chloride	0 10	0 15
Sulphate, pure.	0 10	0 15
common	0 06	0 10
DYESTUFFS.		
Annatto	0 35 @	0 60
Aniline, Magenta, cryst	2 50	2 80
liquid	2 00	—
Argols, ground	0 15	0 25
Blue Vitrol, pure.	0 09	0 10
Camwood	0 06	0 09
Coppers, Green	0 01½	0 02
Cudbear	0 16	0 25
Fustic, Cuban	0 03	0 04
Indigo, Bengal	2 40	2 50
Madras	0 85	0 90
Extract	0 26	0 30

DYESTUFFS—Continued.	
Japonica	0 07 0 08
Lacdye, powdered	0 33 0 38
Logwood	0 01½ 0 03
Logwood, Camp	0 01½ 0 03
Extract	0 10½ 0 12
1 lb. bxs.	0 13 —
" ½ lb. "	0 14 —
Madder, best Dutch	0 11 0 12
2nd quality	0 10 0 11
Quercitron	0 03 0 05
Sumac	0 06 0 08
Tin, Muriate	0 10½ 0 12½
Redwood	0 05 0 06
SPICES.	
Allspice	0 11½ @ 0 12
Cassia	0 26 0 28
Cloves	0 60 0 65
Cayenne	0 22 0 28
Ginger, E. I.	0 19 0 20
Jam	0 30 0 30
Mace	1 50 1 60
Mustard, com	0 20 0 25
Nutmegs	1 15 1 25
Pepper, Black	0 20 0 21
White	0 31 0 32
PAINTS, DRY.	
Black, Lamp, com.	0 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 30 0 35
Magnesia	0 20 0 25
Litharge	0 07 0 09
Pink, Rose	0 12½ 0 15
Red Lead	0 07½ 0 08
Venetian	0 02½ 0 03½
Sienna, B. & G.	0 07 0 08
Umber	0 07 0 10
Vermillion, English	2 00 2 10
American	0 25 0 35
Whiting	0 1½ 0 02
White Lead, dry, gen.	0 08½ 0 09
" No. 1.	0 07 0 08
" No. 2.	0 05 0 07
Yellow Chrome	0 12½ 0 35
" Ochre	0 02½ 0 03½
Zinc White, Star	0 10 0 12
COLORS, IN OIL.	
Blue Paint	0 12 @ 0 15
Fire Proof Paint	0 06 0 08
Green, Paris	0 30 0 37½
Red, Venetian	0 07 0 10
Patent Dryers, 1 lb tins.	0 11 0 12
Putty	0 03½ 0 04½
Yellow Ochre	0 08 0 12
White Lead, gen. 25 lb. tins.	2 35 —
" No. 1	2 10 —
" No. 2	1 85 —
" No. 3	1 60 —
" com	1 30 —
White Zinc, Snow	2 75 3 25
NAVAL STORES.	
Black Pitch	3 90 @ 4 25
Rosin, Strained	3 80 4 25
Clear, pale	5 75 7 25
Spirits Turpentine	0 50 0 52
Tar Wood	3 90 4 25
OILS.	
Cod	0 63 @ 0 70
Lard, extra	1 10 1 20
No. 1.	1 05 1 10
No. 2.	0 90 0 95
Linseed, Raw	0 61 0 66
Boiled	0 65 0 68
Olive, Common	1 05 1 10
Salad	1 80 2 30
Pints, cases	4 20 4 40
" Quarts	3 25 3 50
Seal Oil, Pale	0 72½ 0 75
Straw	0 68 0 70
Sesame Salad	1 30 1 35
Sperm, genuine	2 55 —
Whale refined	0 70 0 75