

**AMERICAN DRUGGIST. AN  
ILLUSTRATED MONTHLY  
JOURNAL  
OF PHARMACY, CHEMISTRY  
AND MATERIA MEDICA. VOL. XV**

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# American Druggist

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OF

Pharmacy, Chemistry and Materia Medica

FRED'K A. CASTLE, M.D.,

LATE PHYSICIAN TO THE PRESBYTERIAN HOSPITAL,  
AND LECTURER ON PHARMACOLOGY, BELLEVUE  
HOSPITAL MEDICAL COLLEGE

EDITOR

CHARLES RICE, Ph.D.,

CHEMIST OF THE DEPARTMENT OF PUBLIC CHARITIES  
AND CORRECTIONS

ASSOCIATE EDITOR

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# American Druggist

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## THE MANUFACTURE OF PHOSPHORIC ACID FROM PHOSPHORUS.

MR. ADOLPHE SOMMER, of Berkeley, California, describes in *The Pharmacist*, for December, the various processes for making phosphoric acid heretofore employed, and proposes a new method, with several modifications of apparatus, which are described by him, as follows:

A common tin can (see p. 2), with removable cover, is made perfectly water-tight by resoldering the seams. Through the centre of the cover a hole is punched, just large enough for the stem of a long thermometer to pass through; and three or four more holes, if not more than  $\frac{1}{8}$  inch in diameter, are made near the circumference of the cover. All around the inside of the can there is suspended by little hooks, which are formed by making incisions into the upper edge of the can, a piece of cloth reaching from the top to the bottom of the can. In the can is placed a glass jar which must be able to hold at least 54 times as much water, by weight, as there is P to be oxidized. A funnel, amply large enough to hold the P, and wider than the jar, is placed upon the latter, and the funnel tube loosely closed by a piece of glass. (Instead of a glass jar and funnel, a bottle may be used which has been cut in two at about three-fourths of its height. The upper and smaller portion of the bottle is inverted and placed into the lower portion, and answers the purpose of holding the P quite well.) Four or five times as much water as the weight of the P is then poured

into the space between the tin can and the glass jar, and the whole apparatus filled with carbonic acid gas. When, by the extinction of a burning taper, which is introduced into the upper portion of the can, it becomes evident that the atmospheric air has been entirely displaced, the sticks of P are laid in the funnel, the thermometer bulb buried between the sticks of P, the cover put on the can, and all openings, save one, closed by plugs. Through the open hole carbonic acid is passed into the apparatus for a short time, in order to remove the air which has entered the apparatus during the introduction of the P. When this is considered accomplished, the last hole is closed, the apparatus put in a cool

place, which is not exposed to draught, and allowed to stand at rest for some time. When it is observed that the temperature within remains constant, one hole is opened, and the apparatus left undisturbed for at least twenty-four hours. If the temperature within this time has not approached 35° C., another hole may be opened, and the same precautions observed as before. The number of holes that can thus be opened, before the critical temperature (above 35° C.) is reached, depends, of course, upon the temperature of the atmosphere surrounding the apparatus. If, at any time, from an excessive supply of air, or from an unusually high temperature of the atmosphere, the temperature of the P should rise above 35° C., there is great danger that it will, as the writer has found to his sorrow in

several instances, rapidly reach the melting point of P, which is 45° C. When this occurs and the P melts, it will naturally run into the receiver (the glass jar), and there, being screened from the action of the air by a covering of acid liquid, congeal into a solid cake. It then becomes necessary to take the apparatus apart, to remove the P from the receiver, and to recommence the whole operation. After the apparatus has once been regulated, however, it requires no further attention until the P is entirely oxidized, which can be known by the thermometer indicating the same temperature within the apparatus as prevails without.

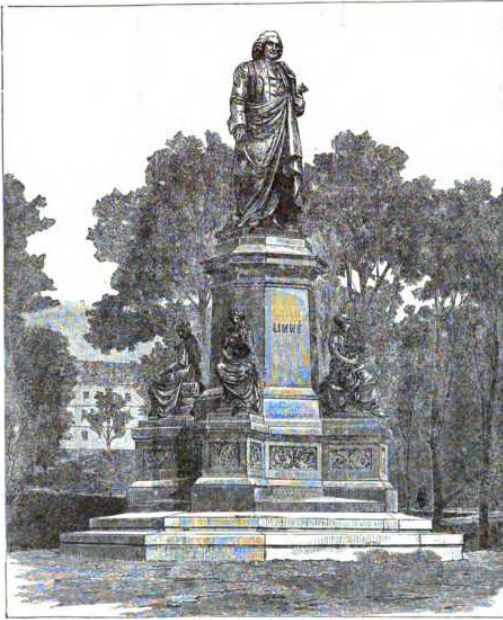
It may seem desirable to have an

explanation of some of the features adopted in this apparatus. The water in the apparatus was found necessary, because the ordinary atmospheric air does not contain sufficient moisture to dissolve the coating of oxides formed on the sticks of P as rapidly as it is formed; but it was also found, that unless, by some means, the water was brought to the space above the P, the air entering the apparatus would not become moist sufficiently fast to produce the effect desired. A piece of cloth, lining the inside, and capable of drawing the water from the bottom to the top of the apparatus, suggested itself as the simplest means of effecting this purpose, and it does fulfil this function very satisfactorily. The reason for the adoption of several small holes instead of a single large opening, as a means of regulating the supply of air, is so evident that it needs no explanation. This style of apparatus is, however, not very durable, because of the slight, though perceptible, evaporation of the P, which causes a deposit of phosphoric acid to form on the inside of the tin can. This acid deposit slowly corrodes the tinned iron, and causes, after about three months of continuous operation, the formation of holes in the sides of the can. Through these holes an excessive amount of air is liable to enter the apparatus and cause the melting of the P.

## II.

For the construction of a continuous and transparent oxidizing chamber, a thick bottle, preferably one of white and very clear glass, is selected, and the bottom very carefully cut off. (Figure 2.) (This cutting or crack-

ing is best done by means of specially prepared carbon pencils made of powdered charcoal, saltpetre, and tragacanth). A common unglazed flower pot, the largest that will go into the bottle, is inserted into the open bottle, so that the bottom of the flower pot is directly over and in contact with the neck of the bottle. A funnel, the conical part of which is at least one inch shorter than the flower-pot, is then inserted in such a way that the funnel tube passes through the bottom of the flower-pot and the neck of the bottle. Into the neck of the bottle the funnel tube is securely fastened by means of



The monument to Linnaeus in Stockholm.

(See page 10.)

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It may seem desirable to have an

\* (See, also, advertising page 22 of AMERICAN DRUGGIST, for December, 1885.—Ed. AMER. DRUGG.)

a perforated rubber stopper or paraffined cork, which must be water-tight. Over the protruding end of the funnel-tube is fastened, by means of a bit of rubber tubing, a piece of glass tube, closed at one end and having a hole on one side. This closed tube is pushed so far over the funnel-tube that the opening in its side is a little above the end of the funnel tube.

This portion of the apparatus is then placed, neck downward, over a large glass jar.

Through the centre of the bottom, which was cut off the bottle, a hole of at least five-eighths of an inch in diameter is drilled. The bottom is then put into its original position on the bottle and fastened by gluing strips of paper over the joint. The hole which was drilled through the bottom is loosely closed by a paraffined cork, through which passes a thermometer.

When the oxidizing chamber is thus completed, the cork is removed, and by means of a funnel, having a long

undisturbed for about twenty-four hours. If at the end of this time the temperature of the P is below 35° C., a little more ventilation may be given by enlarging the notches in the cork. Whenever it is seen that the P is nearly consumed or the water evaporated, a fresh supply is added through the hole without taking the apparatus apart.

The flower-pot in this apparatus performs the same function as is fulfilled in the former (I.) by the cloth lining, namely, that of absorbing the water and moistening the air. The closed glass tube which is attached to the funnel prevents the access of air from below to the P in the oxidizing chamber.

The acid that is formed runs down the funnel into the closed glass tube and thence through the lateral opening into the glass jar, which serves as receiver.

## III.

A still simpler form of a continuous oxidizing chamber I have constructed

After the pouring of a few drops of water into the funnel, whereby the bend of the glass tube is closed against a downward escape of gas, the apparatus is either filled with carbonic acid gas in the manner described under (II.), or the oxygen is simply removed therefrom by burning P in the interior. For this latter purpose a small iron deflagrating spoon, which will pass through the hole in the flower-pot, is employed. A bit of P is laid into the spoon, ignited and quickly inserted into the flower-pot. When the P ceases to burn, the spoon is lifted out, and the hole in the pot immediately closed by means of a cork. The apparatus is left undisturbed for a short time, until the air within has cooled to the normal temperature. The introduction of burning P is then once more repeated, and after cooling, the apparatus is charged with P through the hole in the flower-pot.

The further manipulations and precautions are the same as have been given in the description of style II.

FIG. 1.

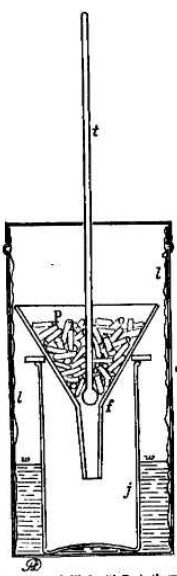


FIG. 1.—f, funnel filled with P; t, thermometer; j, glass jar; w, water; s, stopper; a, tin can.

FIG. 2.

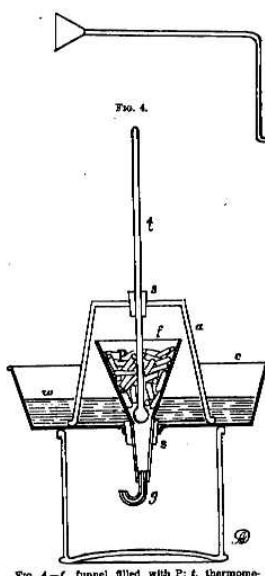


FIG. 2.—f, funnel filled with P; t, thermometer; j, glass jar; w, water; s, perforated stopper; a, flower pot; g, bent glass tube; c, tin pan.

FIG. 3.

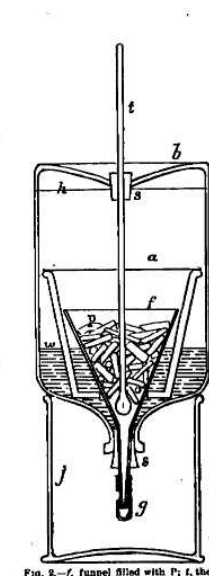


FIG. 3.—f, funnel filled with P; t, thermometer; j, glass jar; w, water; s, bottle (inverted); a, perforated stopper; a, flower pot; g, glass tube with opening on its side; h, line of the cut.

bent tube (Figure 3), water is poured into the space between the walls of the bottle and the flower pot, until its level is within a short distance from the upper edge of the funnel within the flower-pot. A few cubic centimeters of water are also poured into the funnel until the water in the closed glass tube, which is attached to the end of the funnel tube, reaches a little over the end of the funnel tube.

Then a tube connected with a carbonic-acid generator is inserted into the hole and carbonic acid gas passed into the oxidizing chamber. When the air within has been entirely displaced by the gas, sticks of P are dropped through the hole into the funnel, until the latter is nearly filled. The thermometer and cork are then placed into position and the apparatus allowed to stand for a few hours. Then some notches are cut lengthwise into the cork and the apparatus again left

in the following manner (Figure 4): Through the bottom of a tin pan a hole of about one inch in diameter is cut, and a tube of tinued iron about a half-inch long soldered into it. By means of a perforated cork a funnel is fastened into this hole so that the funnel tube passes through the bottom, while the body of the funnel is inside of the tin pan. Into the end of the funnel tube is inserted and fastened by a bit of rubber tubing a glass tube bent in a half circle. A common unglazed flower pot is inverted over the body of the funnel and a paraffined cork with a thermometer inserted into the hole, which is in the bottom of the flower-pot. The whole apparatus is then placed over a glass jar and some water poured into the tin pan.

The tin pan may advantageously be displaced by a wooden water bucket, whereby the apparatus becomes almost indestructible.

The rate at which the P is oxidized by my method is a comparatively slow one. In an apparatus of style I., in which the temperature was kept on an average eleven degrees higher than that of the surrounding air, and the P, which was in the form of a solid cake of nearly five inches in diameter, exposed a surface of about 18 square inches, the P was oxidized at the rate of about 10 Gms. a day. The difference between the inner and outer temperature does not seem to be affected to any extent by an increase or decrease of the prevailing temperature; for nearly 200 observations which were taken at temperatures of the atmosphere ranging from 10 to 22° C., gave, while all other conditions remained equal, an almost constant difference.

The acid which collects in the receivers has a specific gravity of 1.48 to 1.5, and is composed mainly of phosphorus and phosphoret acids in the propor-



tion of 1 to 4, besides water. The exact composition differs with circumstances, and the determination of those circumstances may be the subject of some future paper.

The further treatment of this acid is in every respect the same as has already been described by Prof. Wenzel; but an acid prepared by my method has this great advantage over the one prepared by the former process, that it is already highly concentrated, and requires very little evaporation before the arsenious acid is reduced.

**Oxidation of Phosphorous Acid to Phosphoric Acid by means of Bromine.** (Bromhydric acid as by-product.)

The product of the slow aerial oxidation of phosphorous contains about 1 molecule of phosphorous acid to 4 molecules of phosphoric acid, and, besides these, some impurities, such as arsenious acid and others, mostly derived from the phosphorous. Of these impurities the arsenious acid is particularly objectionable and must be removed before the process of oxidizing is entered upon. The removal of the arsenic, as has been described in the foregoing ("The Manufacture of Phosphoric Acid from Phosphorous"), is best effected by heating the acid to 190° C., subsequent diluting and filtering, after which the acid is ready to be oxidized. Heretofore nitric acid has been the only substance employed for this purpose, but since the price of bromine has become so low (about 35 cents per lb., in 5 lb. bottles) that its cost is no longer prohibitory to its employment in the industries, and, furthermore, since the value of hydrobromic acid has been recognized both in analytical chemistry as well as in therapeutics—it may prove advantageous to substitute bromine for nitric acid in the oxidation of phosphorous to phosphoric acid.

From the equation (see foot note) it will be seen that it requires nearly 2 parts of bromine to every 1 part of phosphorous acid. But the total acidity of the mixture of phosphorous and the phosphoric acids, when of a sp. gr. of 1.48, is about 66 per cent, the composition of which approximates the proportion of 1 molecule (or 124 of H<sub>2</sub>PO<sub>3</sub>) to 4 molecules (or 544) H<sub>2</sub>PO<sub>4</sub>. To convert the 124 of phosphorous acid into phosphoric acid would require theoretically 2 x 12 = 246 of Br. This result agrees very closely with that obtained in practice where it was found that with an acid of a sp. gr. of about 1.48 there was needed a little over one-fourth of its weight of Br to complete its oxidation. This operation may be performed after the arsenic has been removed, either in a bottle containing the acid and Br by shaking this mixture from time to time—it must, however, not be shaken too often, nor too much at one time, since a considerable amount of heat is liberated by the reaction, which may easily reach the boiling point of Br, 58° C.—or it may be accomplished more rapidly by pouring the two substances into a retort and keeping the mixture agitated by slowly passing air through it. In order to prevent any Br vapor, which is carried off by the air, from contaminating the atmosphere of the laboratory, I caused the air which escaped from the retort to pass through two bottles containing a solution of caustic potash. When the mixture is no longer decolorized on standing for about 24 hours, but retains a perma-

nent orange color which is due to an excess of Br, the oxidation may be considered completed. The excess of Br is best removed by the addition of a small portion of the unoxidized mixture of acids, which has been reserved for this purpose.

A still better plan by which the liability of introducing a large excess of Br into the acid is avoided, but which, when carried out at the ordinary temperature of the atmosphere, requires a little longer time than the one last related, consists in pouring the acid to be oxidized into a large wide-mouth glass-stoppered bottle, and the Br into another but smaller glass-stoppered bottle, which will go into the large one. After the open bottle with Br has been inserted into the bottle with acid and the latter closed, the Br gradually evaporates and oxidizes through its vapor, which is absorbed by the acid, the phosphorous to phosphoric acid. When the interior temperature of the apparatus is kept below 25° C., the acid does not consume the

hydric acid, which does not evaporate to any great extent until a temperature of about 123° C. has been reached, begins to distil. The distillation is continued until a temperature of about 180° C. is reached, when the fire is extinguished and the receiver with bromhydric acid detached. The retort and its contents are allowed to stand till cold, when a quantity of water equal to about one-third of the bulk of the contents is poured into the retort. Heat is then again applied, and the distillation continued until the temperature within the retort has reached the same height as before. This second distillation serves to remove a portion of bromhydric acid which cannot be removed in the first distillation.

The phosphoric acid, which forms the residue in the retort, is a black, syrupy liquid, which, however, after dilution with water, digestion with about 1/2 of purified animal charcoal, and subsequent filtration through white filtering paper (best the brand known as "Chlorine paper"), becomes perfectly colorless.

The black color of the phosphoric acid is due to an organic impurity of the commercial Br, which, it is said, is derived from the tuting of the stills, in the composition of which tar is used. The bromhydric acid, which has distilled over, requires to be re-distilled, before it can be considered sufficiently pure for pharmaceutical purposes.

If the addition of Br is made to an acid, from which the arsenic has not been removed, the entire amount of arsenic will distil over with the bromhydric acid, while the phosphoric acid will be found free from arsenic.

UNIVERSITY OF CALIFORNIA, BERKELEY, CAL.



Fig. 5. Oxidation of phosphorous acid by bromine vapor.

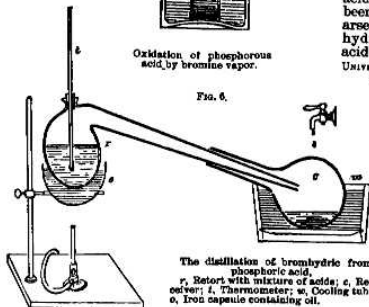


Fig. 6. The distillation of bromhydric acid from phosphorous acid. r, Retort with mixture of acids; a, Receiver; t, Thermometer; s, Cooling coil; c, Iron capsule containing oil.

Br as rapidly as it evaporates, and therefore is under these conditions always dark orange colored, unless the supply of Br vapor is shut off by closing the Br bottle, whereupon the color of the acid disappears within 24 hours.

But when the apparatus is kept in a moderately warm place, where the temperature is 25° C. or over, the reducing power of the phosphorous acid is so much increased that the mixture of acids remains colorless, or acquires only a light orange color, so long as any phosphorous acid is left unoxidized. But as soon as this acid has disappeared, the liquid assumes a dark orange color, when the bottle with Br is to be lifted out, closed, and kept for the next operation.

There remains then only the separation of the bromhydric acid from the phosphoric acid, which is accomplished by distillation in a retort from an oil bath. The precautions which have been pointed out in a previous article on the manufacture of bromhydric acid, in regard to its liability to decomposition by organic substances, have to be observed here. The mere insertion of the neck of the retort into a well-cooled receiver is sufficient. Neither tuting nor rubber connections are necessary. The first portion which comes over consists principally of water (and Br, if this has not been removed in the manner stated above), and should be withdrawn before the brom-

**Continuous Administration of Nitrous Oxide.**

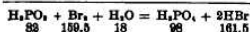
In 1861, Dr. S. Kliukovitch, of St. Petersburg, following the suggestion of Dr. Paul Bert, of Paris, made some experiments on himself, with a mixture of nitrous oxide and oxygen, in the proportion of 80 to 20, without any increase of atmospheric pressure, with a satisfactory result. He also used it for alleviating the pains of labor, and found it very successful and perfectly safe; the great objections to it being its expense, and the cumbersome nature of the required apparatus. Some months ago Professor Zweifel, of Erlangen, erected the necessary apparatus for the supply of the mixed gases to the accouchement-ward of his obstetric clinic. He finds it best to administer the gases continuously during the latter part of labor, when the pains are most severe, not, as was practised by Kliukovitch, merely giving the gases when signs of an approaching pain appeared. Though this treatment has been adopted in sixty cases, no retardation of the process was ever observed. The patients were generally semi-conscious; so that though they would answer if asked a question, they felt no pain, and were unaware when the child was born.—*British Med. Journ.*

**To Administer Paraldehyde.**

WM. CRAIG, M.D., in *Brit. Med. Journ.*, gives:

B Pulv. Tragacanth Comp. (Br.)	...gr. xx.
Eyr. Aurantii	.....f. iij.
Paraldehyd.	.....f. s. i.
Sp. Chloroformi	.....ʒ. xv.
Aque	.....q. s. ad f. s. iij.

M. To be given at bedtime in a single dose.—*Philad. Med. Times.*



## HAYWARD'S CORK-PULLER.

JOHN W. HAYWARD, of St. John's Newfoundland, is the inventor of an appliance for drawing corks, which makes it as easy to get a cork out of a bottle as it is to drive it in. An ordinary cork, O, of the required size, has a piece of strong non-corrosive twine, 1, let into its sides. A button or shield, 5, also non-corrosive, is placed on the inner end of the cork to prevent the twine cutting through it. A hand metal tag, 2, is secured on the twine where it is knotted, or in case a capsule is placed on the end of a piece, 4, which hangs below the capsule.

A rubber button, 3, placed on the outer end of the cork, has a hole or slit through which the twine passes. In 6 is shown the wire attached to the



bottle neck, 6' representing the hook, and 6'' the manner of locking it in place. 7 gives the appearance of a bottle when corked and the twine secured on the wire hooks. In 8, a capsule has been placed over the cork, and the tag is seen protruding beneath its edge. 9 shows the manner of securing the twine over the wire by stretching the elastic button, 3, and 9' the top view of the bottle when the operation is completed.

When the cork is being driven into the bottle, the rubber button is turned over on the twine and tag, as shown in 10, to protect them from injury. The button is then reversed, one loop of the twine passed under the wire hook on one side, and by stretching the rubber button the other loop is secured on the opposite hook. The process of unlodging is shown in our last figure. The tag is grasped, and by an upward twist the capsule is torn open. The twine is disengaged from the wires, and, by passing the first and second fingers through the loop, the cork can be readily drawn. This system does away with the corkscrew entirely, each cork carrying its own means of release. It is applicable for any liquids, medicines, liquors, inks, etc., and as the corks are not injured they may be used a number of times.—*Scientific American*.

[It is by no means necessary to resort to so intricate a device as the one just described to accomplish the purpose of getting out a cork without the intervention of a corkscrew. A piece of small but strong twine is all that is essential, and two (or several) modes of using it are shown.]

In Figure 2, one end of the twine having been tied about the neck of the bottle, the twine is laid across the centre of the opening, allowing a little slack towards the end that is last (a). The cork having a notch cut across its lower face to prevent the twine slipping, is then pushed into the neck of the bottle, and the free end of the twine (b) will serve as a means for drawing the cork out.

A second, Figure 3, which is a little more elaborate, consists in first tying a loop, a, by means of which to attach a label, or to serve for hanging the bottle up out of the way of children, etc., then tying the ends together at b, so as to encircle the neck, cutting one of the ends short, and tying the other

tightly around the cork in the manner shown. This method serves not only to furnish a cork-drawer, but prevents the cork being lost. Either method is especially useful in the case of medicine bottles for travellers.—*Ed. AMER. DRUGGIST.*

## Sponges for Surgeons.

Mr. LAWSON TARR's method of preparing sponges is as follows: New sponges are first put into a large quantity of water with sufficient muriatic acid to make the water taste disagreeably acid. They remain in this mixture until all efforescence has ceased and all the chalk is removed. For this purpose it may be necessary to renew the acid several times. The sponges are afterward carefully and thoroughly washed, to make them as clean as possible and free from every rough particle. After being used at an operation, they are first washed free from blood, and then put in a deep jar and covered with soda and water (one pound of soda to twelve sponges). They are left in this about twenty-four hours (or longer if the sponges are very dirty) and then they are washed perfectly free from every trace of soda. This takes several hours' hard work, using hot water, squeezing the sponges in and out of the water and changing the water constantly. Leaving them to soak for a few hours in very hot water greatly assists in the cleansing. When quite clean, they are put in a jar of fresh water containing about one per cent of carbolic acid; after being kept in this way for twenty-four hours they are squeezed dry and tied up in a white cotton bag, in which they are left hanging from the kitchen ceiling till they are wanted.—*Amer. Journ. of Obstet.*

## Enveloping Paper.

PROF. VAN DER BERG, of Holland, after a series of experiments which



Hayward's cork-puller.

would take a pamphlet of some hundred pages to describe, found that paraffin paper is decidedly superior to all other kinds of wrappers actually in use, in preventing loss of weight, flavor and aroma from contained medicaments and pharmaceutical products in general. Next to paraffin paper came ordinary note paper (writing paper), then parchment paper, and lastly filtering and blotting papers. Doubtless if the paraffin employed has been previously made to dissolve about 1/4 of salicylic acid a still superior result will be obtained, insuring the absence of mould or mildew.—*Chemist and Druggist.*

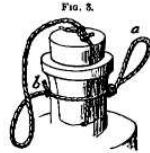
## Egg-Julep for the Hair (Piesse).

Rectified Spirit..... 1 pint.  
Rose-Water..... 1 gallon.  
Extract of Rodeletia..... 1 pint.  
Transparent Soap..... 1 oz.  
Egg Saffron..... 1 drachm.

Shave the soap very fine, boil it and the saffron in a quart of the rose water; when dissolved, add the remainder of the water, then the spirit, finally the rodeletia, which is used by way of perfume. After standing two or three days, it is fit for bottling.—*Chemist and Druggist.*

## For Toothache.

B Acetate Lead.....gr. x.  
Distilled Water.....f. ʒ ss.  
Tr. Opium.....f. ʒ i.  
M.



Apply to the hollow tooth with absorbent cotton.—*Med. Age.*

## Tooth-paste.

Precipitated Chalk..... ʒ ss.  
Carbonate of Magnesia..... ʒ i.  
Powdered Soap..... ʒ i.  
Glycerin..... ʒ i.  
Oil of Neroli..... 10 drops.  
Syrup of Orange Flower..... ʒ i.  
M.

—*Chemist and Druggist.*

## Application for Neuralgia.

Chloral Hyd..... ʒ ss gr.  
Menthol..... ʒ i.  
Caesio Butter..... ʒ i.  
Spermaceti..... ʒ i.  
M. Make into a cone-shaped mass.—*Phil. Med. Times.*

## Mucilage.

T. W. WATKINS states that a mucilage of acacia, which will not spoil, may be made as follows:

Oil of Gaultheria..... ʒ xv.  
Calcium Phosphate..... sufficient.  
Water..... ʒ viij.  
Acacia..... ʒ iv.

[Triturate the oil of gaultheria with about one drachm of the phosphate of calcium and afterwards the water and filter. Then use the filtrate to make a mucilage with the acacia.]—*Therapeutic Gazette.*

## Himrod's Asthma Cure.

STRAINS' *New Idea* said it can be imitated by a coarsely ground mixture of stramonium leaves and lavender flowers, with a little benzoin, the whole sprinkled with sufficient saturated solution of nitrate and chlorate of potassium to make the powder burn well; the patient to inhale the fumes. Another formula given by the correspondent of the *Druggist's Circular* recommends equal weights of powdered lobelia, stramonium, black tea, and nitrate of potash, well mixed and sifted. Dr. Morell Mackenzie soon afterwards published some lectures on "Hay Fever," and quoted the last formula, saying the addition of a little aniseed or fennel would make a compound which, in appearance and effect, is very similar to Himrod's remedy. He could not trace any tea in the original by microscopical examination, but he seemed to think it was a desirable addition. A French formula recommends stramonium and sage. The proprietor of the formula has denied that any of those published are correct.

## Varnish for Labels.

Sandarac.....	150 parts
Mastic.....	80 "
Yonic turpentine.....	15 "
Alcohol.....	300 "

Macerate, with repeated stirring, until solution is effected. Then filter, and add enough

Alcohol to make.....1,000 parts.

Paper labels are first sized with diluted mucilage, then dried, and then coated with this varnish. If the labels have been written with water-soluble inks or color, they are first coated with two coats of collodion, and then varnished.—*KUENZ DIERICH in Central-halle, No. 41.*

## Artificial Gutta-Percha.

50 KILOGRAMMES of copal resin, and 74 to 15 kilograms of pulverized sulphur, are mixed with double the quantity of oil of turpentine, or with 55 to 65 liters of petroleum oil, in a tank which contains an agitator, and the mixture is then heated to a temperature which may vary from 122° to 150° Centigrade, the whole being stirred until complete solution is effected. The mass thus obtained is then cooled down to about 38°, and a solution of casein added which contains about 3 kilograms of casein, dissolved in warm ammonia water and a little methylated spirit. The whole is then again heated to between 122° and 150° until it assumes a thin consistence, when it is caused to boil with a solution of tannic acid, containing 15 to 25 per cent of tannic acid and about 1 kilogram of ammonia.—*M. ZINZLER, Monthly Mag. of Phar., etc.*

## Explosive Drugs.

A LIST has been recently published, in the *Union Pharmaceutique*, of accidents which have recently occurred during the preparation or carriage of explosive substances used in medicine. At Strasburg, a chemist's assistant was changing some *lycopodium-powder* from one bottle to another; the particles that escaped mixed with the air, a jet of gas was burning, and a slight explosion occurred. The frightened assistant dropped the jar containing the *lycopodium*, the room was at once filled with the powder, and a violent explosion took place. M. Meyet has stated that a tooth-powder composed of *chlorate of potassium* and *cinchona* has been known to explode in the mouth of a person engaged in brushing his teeth. A druggist who dried some *hypophosphite of calcium* in a receptacle containing sand was killed by its explosion. *Oxalate* and *citrate of calcium* are also explosive, but only at a high temperature. Pills of *permanganate of potassium* have been known to explode spontaneously. A mixture of *chlorate of potassium*, *chloride of iron*, and *glycerin* exploded in the pocket of a patient who carried it. An eminent chemist at Paris prepared ozone with powder composed of equal parts of *peroxide of manganese*, *permanganate of potassium*, and *pulverized osalic acid*. He took every recognized precaution, and the mixture was corked up in a bottle; a few minutes afterwards an explosion took place, and the bottle was reduced to atoms.—*Med. and Surg. Reporter.*

## Insolation of Olive Oil.

L. MORHBT says that when olive oil is exposed to sunlight for the space of a month it is permanently bleached. Its specific gravity is not found to have altered. When oil which has been thus exposed to the sun is afterwards treated with nitric acid of 1.83 sp. gr. in the usual manner, it does not turn green as ordinary olive oil does, but only takes a reddish-yellow tinge. With nitric acid or soda it becomes whitish, and not green or pale yellow.

These two tests can therefore no longer be utilized to recognize it. On the other hand, olive oil which has been exposed to the sun for a month, concretes into a solid mass as before under the influence of nitrous vapor, but the author assures us that even this property of the oil disappears if the insolation be carried far enough; for instance, if it be carried on for three or four months in wide, open vessels.

The insolated oil is acid to test papers; moreover it is found to have contracted a rancid taste and odor; it possesses the property also of dissolving aniline red, as certain sophisticated samples of olive oil are found to do likewise. The action of light on oils may find some further useful applications. Oiled papers are again coming into use in photography, and calcoprinters may probably find new uses for insolated oils.—*Mon. Mag. of Phar., etc.*

[Insolated olive oil may have some trade uses, but that which is to be employed for the table or medicinally, should be carefully protected from sun-light for even a very short time, if it is desired to retain its flavor.—*Ed. AM. DRUGGIST.*]

## Chrysophanic Acid of Rhubarb.

ACCORDING to Dr. Kuhl, chrysophanic acid is first formed in rhubarb root, upon digestion of the latter in water, and none of this acid pre-exists in the more important kinds of rhubarb. Its formation is due to decomposition of the substance known as chrysophan, which does exist in the root. This decomposition is due to a ferment which is soluble in water, but not in alcohol. It is for this reason that an alcoholic extract of the root can be evaporated without decomposition, because while chrysophan will be contained in it, the ferment will not. We can thus explain also why extract of rhubarb prepared with dilute spirit will deposit from time to time a yellow precipitate, which consists, according to Clark, chiefly of chrysophanic acid. Chrysophanic acid, which is largely used as ointment in skin diseases, has been recently shown to possess strongly antiseptic properties, to which rhubarb probably owes its beneficial action in catarrhs of the stomach, indigestion, etc.—*Mon. Mag. of Phar., etc.*

## Distillation of Oil of Star-anise.

ACCORDING to a report made to Schimmel & Co., of Leipzig, oil of star-anise is distilled, in Annam, in the following manner: Ten kilograms of fresh, green star-anise fruits are put into an iron boiler of about 27 inches diameter and enough water added to nearly fill it. Another similar iron vessel is then turned upside down over it. The latter has a hole, about 12 inches wide, in the bottom and upon this is placed an earthen vessel surrounded by an iron frame in which cold water circulates to condense the vapors ascending into the vessel. The condensed liquid is conducted from the latter by means of a bamboo into tinued receptacles, where the oil rises to the surface. One distillation lasts two days. The 10 kilos. of star-anise yield 250 Gm. of oil [this is about 24 per cent]. A single distiller—and there are many of these—annually produces 150 to 180 kilos. It is principally prepared in and about Lang-son, Ki-lun, Dong-Dang, and Ha noi in Annam, and is brought to market in Luong-Chan (China), packed in the well-known cans. Before the French occupation of Hanoi and Bao-ainh, a portion of the yearly product found its way to Tonquin by way of these two cities. Since then, however, the Chinese dealers have acquired the monopoly of the trade. The manufac-

ture is reported to be subject to a tax, levied by the tuam-phu, who owns the distilling apparatus, and, at the same time, large plantations of star-anise in the province of Lang-son.

## On the Feeble Stability of Salicylates.

Dr. G. VULPIUS directs attention to the fact, already brought forward previously by others, that the peculiar antizymotic or antiseptic property of free salicylic acid is obliterated when the latter is neutralized by bases.

He made a series of parallel experiments with 1 per cent solutions of the salicylates and the sulphates of ammonium, magnesium, copper, zinc, atropine, morphine, physostigmine, and pilocarpine. In the case of the sulphates, two sets of experiments were made, one in which the sulphates alone were used, and the other in which they were treated with 0.1 per cent of free salicylic acid. All of the latter (sulphates containing free salicylic acid) remained absolutely unaltered after 100 days; the solutions of the pure sulphates, with the exception of one scarcely turbid sample, were likewise unchanged. But nearly all the solutions of the pure salicylates were spoiled already after a few weeks.

Dr. Vulpius remarks, very properly, that the choice of a salicylate is not always occasioned by the desire to select a salt which could not spoil. In the case of the salicylate of physostigmine, for instance, the reason why this salt is preferred is this, that it is distinct, dry, and non deliquescent crystals, and does not cake. So far as the keeping qualities of solutions are concerned, however, the sulphates are generally preferable to the salicylates. *Arch. der Pharm., 1885, 794.*

## Pills of Permanganate of Potassium.

E. A. PARON says: "After experimenting with the various excipients that have been suggested, I would recommend one of the following:

"First. Resin cerate, in proportion varied according to the size of the mass, from 15 to 20% of the finely powdered permanganate used. Five grains will make a mass with 25 grains of the salt; 15 grains will make a mass with 100 grains of the salt.

"Second. One part of permanganate, 14 parts of kaolin, 14 clay used for making white porcelain, and water, q. s. The amount of water will vary from  $\frac{1}{2}$  to  $\frac{2}{3}$  of a part.

"Third. Permanganate, 2 parts; kaolin, 1 part; and petrolatum, q. s." The amount of petrolatum required depends upon its consistence. He finds that 4 grains, with 24 grains of permanganate and 12 grains of kaolin, makes a mass somewhat more plastic than No. 1, and decidedly more so than No. 2.

No. 2 integrates most rapidly in contact with water, and No. 1 the least rapidly.—*The Pharmacist.*

## Preparation of Buxine.

The active principle of *Buxus sempervirens*, known as buxine, and found to be identical with beberberine of *Nectandra*, and plesioine of *Farcera*, was described in 1854 by Couerbe as a non-crystalline mass, having a very bitter taste and causing a person to sneeze. Buxine turns litmus paper blue, is very soluble in alcohol, less so in ether, and almost insoluble in water. Nitric acid decomposes it. Couerbe prepared it by boiling with magnesia a watery solution of an alcoholic extract of box, dissolving the resulting precipitate in alcohol, decolorizing the tincture with animal charcoal, filtering and evaporating. The salt prepared with this buxine are very bitter, and yield with alkalis a gelatinous precipitate. The sulphate forms crystalline grains, and, when freed from resinous matters by