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Selected Papers.

The Flowers of Early Spring.*

BY REV. J. W. CHICKERING, JR.

There is perhaps a nearly equal charm about the notes of the first robin, and the sight of the first Mayflower. It will be the object of this article to enumerate, with a few notes upon each, some of our earlier floral visitors, in wood and meadow, in New England.

The list opens, not very attractively, with a plant well-known to all, under the malodorous name of Skunk Cabbage (*Symplocarpus foetidus*), but whose flower is by no means so familiar, save to the observing botanist, and even he must be on the alert to obtain this first gift of Flora, in full perfection of color and aroma. Early in April, or even in March, almost before the ice is fairly melted, may be found in low marshy ground, this flower, clumsy in form, repulsive and snaky in color, dark purple, with yellowish blotches, and disgusting in odor, soon to be followed by the clump of large fleshy leaves, conspicuous during the rest of the summer. Like Stramonium, and most other noxious and unsightly weeds, it has been tried as a remedy for asthma, and with about as much effect.

In very pleasing contrast comes next *Epigaea repens*, or, as it is sometimes mis-called, Trailing Arbutus, better and more appropriately known throughout New England as the Mayflower.

This, among the very earliest, is also the choicest gift that Flora has in this latitude to offer us, alike for its beauty of form and color, its delicious fragrance, and its charming habit of peeping out, almost from the edge of the retreating snowdrifts. To find the first bunch of Mayflowers is the ambition of many a boy and girl, as well as not a few children of larger growth. The finest specimens ever seen by the writer were from a mountain in Camden, Maine. It has also been used as a medicinal agent, but with no better nor worse results than many others. It is a true wild flower, resisting all attempts at domestication. Closely associated with this is found the *Hepatica*, in its two forms of *triloba* and *acutiloba*, one with rounded, the other with pointed leaves, probably merely varieties. The little clump of flowers pushes its way through the ground, often in advance of the leaves, and with the varying shades of pink, blue and white, seen in different plants, is a welcome addition to our spring bouquet, though lacking the fragrance of the Mayflower.

About this same time the southern aspect of rocky hillsides begins to whiten with the cheerful, though not specially graceful or showy flowers of the Early Saxifrage (*Saxifrage Virginiana*), and in forest marshes the inconspicuous little Golden Saxifrage, with a name longer than itself (*Chrysosplenium Americanum*). Soon in the meadows the carpet of living green is embroidered with the golden flowers of *Caltha palustris* or the English Marsh Marigold, improperly called

Cowslip, and whether correctly or not, associated with creamy milk and yellow butter, while a little later are seen in the morning sun, the white stars of the Bloodroot (*Sanguinaria Canadensis*), as fragile as they are beautiful, generally lasting but for a day. Its orange-colored juice is much used in medicine as an emetic, an expectorant, and a liniment. This plant readily bears transplanting, increases in size under cultivation, and becomes one of the most attractive ornaments of the early flower border. In some parts of the country is found a somewhat similar flower, the Twin-leaf, or Rheumatism Root (*Jeffersonia diphylla*) also well repaying cultivation.

Meanwhile the pastures are beginning to whiten (last year remarkably) with the modest little Houstonia, or Innocence (*Oldenlandia cœrulea*), while a host of violets are making their appearance. *Viola blanda*, a wee, white, sweet-scented species, in the woods; *cucullata*, with its large blue flowers and hood-shaped leaves, with their curious palmate variety; *rotundifolia*, with yellow flowers and shiny leaves; and on the hill-sides and in the pastures the widely varying *sagittata*. *Claytonia Virginica*, well named Spring Beauty, must not be neglected in its moist and generally shady bed.

Along streams in open woodlands, we may find the Spring Cress (*Cardamine rhomboidea*), with large, white flowers; and just shooting up its green stalk, its first cousin the Winter Cress (*Barbarea vulgaris*).

Nor should the floral efforts of trees and shrubs be disregarded. Among the earliest indications of spring the Hazelnut (*Corylus rostrata*) shakes its long catkins along the roadsides, before any signs of swelling leaf-buds are visible, while the Willows (*Salix*), whose name is legion, begin to burst their warm wintry covering. The Savin (*Juniperus Virginiana*) is covered with its curious little flowers. The Hemlock (*Abies Canadensis*) is early in flower, as also the American Yew (*Taxus baccata*). All these require close examination to detect their inflorescence, but well repay it. The two maples, *Acer dasycarpum* (the Silver Maple) and *Acer rubrum* (the Red Maple), hang out their showy pendants very early. The Sweet Gale (*Myrica Gale*), along the edges of swamps, and the Sweet Fern (*Comptonia asplenifolia*), whose dried leaves are the basis of juvenile attempts at smoking, are now in flower; and *Dirca palustris*, well named Leather-wood from the marvellous toughness of its bark, such that it is frequently used in default of leather or twine in repairing broken harnesses or sleds, hangs out its little yellow bells in advance of any leaves.

We close the list with the fragrant Sassafras (*S. officinale*), well-known by its aromatic bark and curiously lobed leaves, not so well by its early clusters of yellow flowers, somewhat resembling those of the Sugar-maple; and the Spice-wood, or Feverbush (*Benzoin odoriferum*) also highly aromatic and possessing, like the Sassafras, medicinal value as an aromatic stimulant. Such are the earliest flowers, which in forest, field or fen, invite the search of the botanist and the lover of nature.

Perhaps subsequent articles may give some notes upon the flowers of later spring, summer and autumn, with a floral calendar, and possibly an enumeration of some plants and shrubs well worthy of a place in garden or shrubbery, but hitherto neglected. If this

shall succeed in leading any to a closer study of nature's beauty, and the goodness and glory of the Creator, its object will be answered.

On Essence of Sassafras.*

BY MM. E. GRIMAUD AND Y. RUOTHE.

Essence of *Laurus sassafras* is colourless when first rectified, but turns gradually yellow after exposure to air and light. Its smell resembles that of essence of fœnel. Its density at zero is 1.0815; it rotates the polarised ray to the right, and its rotatory power is 3.5° for a length of 10 centimetres. It is a mixture of dextrogyrous hydrocarbon with an inactive oxygenated principle, and also contains small quantities of a body which is apparently a phenol, and which gives it the power of reducing nitrate of silver. This body is separated from the essence by stirring with this latter an aqueous solution of potash, which, after the addition of chlorhydric acid, precipitates some oily drops, having a strong smell of eugenic acid, and coloured light green by ferric chloride. By distilling this body with steam, a colourless liquid was obtained in just sufficient quantity, to permit analysis, which gave C=74.43, H=6.46. Such extremely small proportions are found in the essence that it can scarcely be said to do more than exist. The hydro-carbide (saffrène) contains C₁₀H₁₆, which formula is confirmed by the density of its vapour, which, ascertained by Dumas's method, was found equal to 4.71 (theoreticaly, 4.7). Saffrène boils between 155° and 157° is dextrogyrous, and its rotatory power is 17°5 for a length of 10 c.c.; its density at zero is 0.8345.

Nine-tenths of the essence are extracted after the first distillation between 236° and 236°. They consist of an oxygenated principle (safrol), which distils chiefly between 231° and 233°. This latter has not a constant boiling point, for it always changes and becomes slightly resinous under the influence of much heat. It is insoluble in water, but difficult to dry over chloride of calcium, and requires rectification in a current of pure hydrogen before analysis. Its odour is similar to that of the essence; its density 1.1141 at zero; it exerts no influence on polarised light, and remains liquid at a cold as low as -20°. Safrol will not combine with bisulphites, dissolve sodium, or decompose chloride of benzoyl at its boiling point. It will not dissolve alcoholic potash even at 180°, but is changed by it into a black, non-crystallisable resin.

Treated with boiling iodhydric acid at 127°, it yields a thick green iodised oil; with perchloride of phosphorus it gives only a protochloride, and no trace of oxychloride, and the thick viscous body left in the retort after distilling the protochloride should be a monochloruretted safrol. It does, in fact, present the appearance and qualities of those monobromised derivatives obtained by merely adding a molecule of bromine to a molecule of safrol, but if excess of bromine be added, a solid crystallized derivative of pentabromised safrol, C₁₀H₂Br₅O₂ is obtained. To prepare this body, dissolve safrol in sulphide of carbon, and add five times its weight of bromine; after a few days the vessel will be

*From the Chemical News.

* This article, which originally appeared in the "American Naturalist," was written to suit the climate of the New England States, but as most of the specimens alluded to are also found in this country, we have no doubt the paper will prove generally acceptable to our readers.—ED. CAN. PHAR. JOUR.

found to contain crystals. Dissolve these in chloroform, wash the solution with potash, and concentrate, rectangular and perfectly white flakes of pentabromised safrol, $C_{10}H_6Br_5O_2$, will separate.

This body melts at 160° or 170° , is but slightly soluble in alcohol or ether, even at the boiling point, and dissolves in about fifteen times its weight of chloroform, with simultaneous production of a very small quantity of another bromised derivative melting at 109° . Upon subjecting safrol to the action of sundry other reagents, no satisfactory results were obtained. Nitric acid, even when much diluted, renders it resinous, with production of oxalic acid; it dissolves in the fuming acid, yielding a non-crystallisable derivative, soluble in alkalies at moderate temperature. When heated with chloride of zinc or phosphoric anhydride, it quickly decomposes, leaving much carbon; sulphuric acid produces the same effect. Fusing potash attacks it with difficulty; a distillation of the essence over melting potash modifies its boiling point; that which formerly distilled between 230° or 234° , now comes over between 245° and 250° , and even at from 247° to 248° . The analysis of this body gives the same figures as that of the essence.

On Some Constituents of Ergot.*

BY J. CARL HERRMANN.

The author extracted 20 oz. finely powdered ergot with ether and obtained 6 oz. of a brown-yellow thickish non-drying oil, of an aromatic odor and acrid taste, at 18° C. of 0.92496 spec. grav., which at a lower temperature separated floccules of a solid fat.

4 oz. of the oil were saponified with caustic soda; during the boiling, traces of ammonia and trimethylamina were observed in the vapor. The crude soap had a brownish-yellow color, which remained in the mother liquor on salting out the soap; this gradually became sticky in the air. The fatty acids were separated by sulphuric acid and repeatedly boiled with water; the first portions of which assumed a golden-yellow color and separated a brown powder, which was similar in color to powdered ergot, retained a little fat, had an acrid bitterish taste, the odor of the oil, was insoluble in water and dilute acids, readily soluble in alcohol, ether and alkalies, and may be regarded as coloring matter.

The aqueous liquid was distilled, and small quantities of butyric and acetic acid, were found in the distillate, while nearly half an oz. of glycerin was obtained by concentrating the residue left in the retort and treating it with strong alcohol.

The fatty acids were filtered in a water bath funnel, combined with carbonate of soda, and the soda soap in alcoholic solution precipitated by acetate of lead. The resulting plaster was washed with water and exhausted by ether. The undissolved powder contained 1.45 water, 59.10 oxide of lead and 39.61 fatty acid (mean). On evaporating the ether the lead soap was left of the consistence of a soft extract, and yielded 1.72 water, 19.37 oxide of lead and 78.46 fatty acid (mean).

To determine the nature of the fatty acids, a portion was pressed between bibulous paper

and repeatedly crystallized from hot alcohol; the dry crystals fused at 62° C., and congealed between 57 and 58° C.; they consisted of pure hydrate of palmitic acid. Ultimate analysis proved the correctness of this inference.

The extract, like lead soap, was decomposed by muriatic acid, and the fatty acid taken up by ether; it proved to be oleic acid.

The proportion of lead oxide to the acids is 5:4, and the fatty acids are 1 palmitic to 3 oleic acid; the composition of the plaster is therefore, $C_{32}H_{51}$ (2 PbO) O_2 + 3 $C_{18}H_{33}$ (PbO) O_2 . By the action of ether this was decomposed so as to yield a basic palmitate and an acid oleinate.

The coloring principle contained in the oil was obtained by treating it with ammoniacal alcohol, and evaporating the alcohol. It corresponds, the solubility in ether excepted, with Wiggers' ergotin, and to it the oil owes its color, aromatic odor and acrid taste.

The author also disproved the assertion of Manassewitz, that the oil of ergot was not saponifiable by caustic potassa.

Since Manassewitz did not succeed in isolating Wenzell's ecbolina, the author operated upon 30 oz. powdered ergot by nearly the process described by Wenzell (in Amer. Journ. Ph., May, 1864) and isolated the alkaloid, which possessed the appearance and reactions indicated by Wenzell. Herrmann also digested the precipitate by bichloride of mercury in Wenzell's process, with carbonate of lead, exsiccated the mixture and exhausted with 90 pr. ct. alcohol, which dissolved ecbolina, together with a trace of chloride of lead. The author promises further researches on ecbolina, also on Wenzell's ergotina and ergotic acid.

1000 grs. powdered ergot contained 50 grs. water, and yielded 22.01562 ashes, consisting of chloride of sodium, silica (14.67 pr. ct.,) and potassa (30 pr. ct.,) soda, lime, magnesia (4.88 pr. ct.,) alumina, iron, manganese combined with phosphoric acid (45.12 pr. ct.,)

Assay of a Pure American Opium.*

From Poppies grown at Hancock, Vermont, by Mr. C. M. Robbins.

BY WILLIAM PROCTER, JR.

On the 18th of January the writer received a sample of about an ounce of opium from Messrs. Rosengarten & Sons, with the information (in the form of a copy of a letter from Messrs. Howe & French, of Boston, Mass.) that it was received from Mr. C. M. Robbins, of Hancock, Vermont, who raised the poppies producing it from foreign seed, which had cost ten dollars per ounce. The opium was obtained by scarifying the capsules in the manner it is done abroad, and the exuded juice collected and dried in the sun, when it turns dark coloured. No leaves, or capsules or other foreign substance is admixed, but its consistence is that of an extract rather soft than firm, but the softness does not appear to be due so much to moisture as to its caoutchoucoïd character, as after long drying it lost but five per cent. of its weight, and broke with a short, shining fracture when quite cold. The entire crop of this experiment was 11 ounces, and in its odor and taste closely resembles good Turkey opium. In a letter from Mr. Robbins, since shown to me by Messrs. Rosengarten & Sons, he says, "I

planted about 15 square rods of land [about one-tenth of an acre] in poppies, rows two feet apart, hills one foot apart. It was in growth from June 1st to October 1st. The heads were punctured only once a day, in the afternoon; we cut several small gashes in the sides, being careful not to cut through the inside. The opium was scraped off next morning and dried on plates in the sun. In my opinion we did not get half the opium that might have been obtained. The poppy seed was not planted early enough by two or three weeks. The poppy grows well and seems hearty, and requires dry soil."

One hundred grains of this opium was rubbed with water in a mortar until the whole was emulsified. After standing several hours with occasional agitation it was thrown on a tared filter, and after draining, the dregs were well washed with water, dried, and weighed 38 grains. The liquid thus obtained was carefully evaporated, at a moderate heat, to six fluidrachms, mixed with its bulk of alcohol and filtered; 30 grains of aqua ammonia, sp. gr. 900, mixed with three times its bulk of alcohol was slowly added with constant stirring until a decided excess was obtained well stirred, and allowed to stand 24 hours. The ammonia caused an immediate granular precipitate, which increased on standing. At the end of the period mentioned, it was collected on a tared filter, thoroughly washed with cold water and dried. The precipitate was of a uniform light drab color, and weighed 18.2 grains. It was now boiled in repeated portions of ether, washed on a filter with that liquid and then dried, when it weighed 16.25 grs. This substance has the properties of morphia, being reddened by nitric acid, blued by sesquichloride of iron, but is colored. It was therefore dissolved in repeated portions of boiling alcohol, the solution filtered and evaporated and crystallized. The filter was well washed, and, on drying, the brown matter weighed 0.5 gr., making the yield of crystallized morphia 15.75 grs.

The ethereal washings of the morphia precipitate yielded nearly 2 grains of crystalline matter, which formed a clear yellow solution with nitric acid, consisting chiefly of narcotina, with a little brownish amorphous matter around the edge of the dish.

The liquid from which the morphia precipitated was found to yield a deep red coloration with sesquichloride of iron, and was treated with a slight excess of chloride of calcium, the gelatinous precipitate collected on a filter, washed, suspended in a fluid-ounce of water, at 190° F., an excess of dilute hydrochloric acid added, filtered hot, and allowed to stand some hours. The crystalline granular precipitate of bi-mecconate of lime was collected and treated with hot diluted hydrochloric acid, when the meconic acid in colored crystals, separated on standing, was washed and dried.

The original undissolved residue of the opium, weighing 33 grains, was now treated with coal oil, benzine, nearly pure, until exhausted, and the dark liquid evaporated until all the benzine was removed. A soft elastic residue of caoutchouc was obtained, weighing 11 grains. This probably contained some narcotina and other principles as resin and fixed oil, but it was not further treated—the chief object of its extraction being to show by its quantity a sufficient cause for the softness of the opium in the absence of the usual percentage of moisture.

*From Wittstein's Viertelj. Schr. in Am. Jour. Pharm.

*From the American Journal of Pharmacy, March, 1870.

The residue left by the boyzino was incinerated in a platinum crucible, yielding 0.5 gr. of light fawn colored ash.

The result from 100 grains, therefore, is as follows:—

Morphia.....	15.75
Narcotina, impure.....	2.00
Meconic acid.....	5.25
Caoutchouc, fatty matter and resin.....	17.00
Insoluble residue (including 0.5 of ash).....	22.00
Matter soluble in water other than salts of morphia and narcotina, as gum extractive, etc.,*.....	38.50
Water.....	5.00

Messrs. Rosengarten & Sons meanwhile made an examination of this opium for morphia, for their own satisfaction, and obtained about 15 per cent., which corroborates this result for that ingredient, the discrepancy in amount being due to more careful manipulation in this assay.

No examinations was made of the gum or extractive ingredients. On the whole it may be inferred that the opium obtained by Mr. Robbins is pure and of extraordinary strength, indicating it to be the inspissated juice of the capsule of the poppy, unadmixed with either organic or inorganic adulteration, and it is to be hoped that the producer will, in the coming season, give his earnest attention to another and more extended experiment, particularly in relation to the extraction of the juice so as to avoid loss. The quantity of soil under culture in this instance was about one-tenth of an acre, and the product was worth at the market rate per single pound (\$14. — $\frac{11}{16}$ = \$9.62) worth nearly \$10 or about \$100 per acre. If, as Mr Robbins says, he obtained only half of the juice, this result may be doubled. Too much stress cannot be laid on the importance of keeping the product unadmixed with impurities, and especially extractive matter as an adulteration, as in Mr. Wilson's so-called opium, which is almost wholly an extract of the leaves of poppies.

On Zinc Sulpho-Phenate.†

BY DR. HAGER,

The preparation of this salt presents no difficulties if pure crystallized phenol and pure monohydrate of sulphuric acid are operated on. Equal weight parts of both are digested at about 125° F. for two or three days. When the phenol is pure a clear, yellowish, thick liquid is obtained, which on cooling deposits conglomerations of crystals (probably uncombined phenol), but which soon congeals to a white crystallized mass. Although all conditions are present to combine all the sulphuric acid with the phenol, yet there remains always, and no matter how long the digestion may be continued, a surplus of about 10 per cent. sulphuric acid. For this reason it is advisable to mix 120 parts of sulphuric acid to every 100 parts of phenol. After two or three days the combination is accomplished, and the mixture is then diluted with ten times its bulk of water. Now twice as much as the quantity of sul-

phuric acid operated upon, or better, a little more, of dry barium carbonate, is gradually added (to 120 parts in s, 245 parts in c). The latter had better be triturated with some water before it is added to the acid. Under evolution of carbonic acid barium sulpho-phenate is formed, a salt soluble in water and in alcohol. At the same time any excess of free sulphuric acid is neutralized and transformed into barium sulphate. The whole is allowed to stand in a warm place for some hours, and is then filtered through a damp filter; the remainder on the filter is washed with some warm water. The filtered solution of barium sulpho-phenate may be evaporated to dryness, whereby it remains behind as a white salt deprived of its water of crystallization. This is soluble in two parts of water. A small quantity of this barium salt is retained, the balance is dissolved in water in the proportion of 10 parts of the first to 30–40 parts of the latter. To this filtered solution a solution of 6 parts crystallized zinc-sulphate in about 18 parts of water is added. Of this zinc solution a small quantity is also retained. Now, after leaving the mixture in the water bath for several hours, about 10 drops of the supernatant solution are diluted in a test tube with about 100 drops of water; this being divided in two parts, the one is examined with some drops of the retained zinc-sulphate solution, the other with the barium sulpho-phenate solution. If any reaction ensues in either case, the one or other of the retained solutions has carefully to be added to the bulk of the solution, in order to accomplish the exact decomposition. A slight excess of zinc-sulphate should, however, prevail, so that the barium may be completely precipitated.

Finally, the filtered solution of zinc sulpho-phenate is evaporated under continual stirring until a drop, when allowed to fall on a cold glass plate, congeals to a solid mass. The liquid is then allowed to cool under frequent stirring, and the resulting salt mass is dried in a warm place. When completely dry it forms a white salt.

The evaporation of the solution of the barium sulpho-phenate, its re-solution and the filtration, are only required when a phenol has been operated on which was not palpably pure. When this, however, is the case, the solution of barium sulpho-phenate may be decomposed, without any further operation, by the zinc-sulphate solution, with the precaution to retain some of the first solution in order to meet an accidental excess of the zinc solution. For every 100 parts of phenol operated upon, 152 parts of crystallized zinc sulphate may be added, of which only one-twelfth may be retained for further addition if required.

The preparation of zinc sulpho-phenate may be facilitated by the use of perfectly pure reagents. When they have been mixed and combined in the above stated proportions and process, the warm solution, after having been diluted with twice its bulk of water, is gradually neutralized with zinc-oxide (free of oxide of iron). When no more oxide is dissolved the warm solution is allowed to cool, and is then filtered; the filtrate is evaporated to nearly half its original bulk, and is then mixed and shaken with ten times its volume of alcohol (90–92 per cent.), and the mixture is allowed to stand in a cool place for several days. The zinc sulphate separates as a powder; the supernatant

alcoholic solution of zinc sulpho-phenate may either be directly evaporated to dryness or the alcohol may first be restored by distillation, and the evaporation may then be accomplished. The residue is white zinc sulpho-phenate of a purity that it yields with barium chloride but a slight reaction.

One equivalent phenol, or phenyl-alcohol, forms, with two equivalent monohydrate of sulphuric acid, a compound ether sulpho-phenic acid ($C_{12}H_{10}O, SO_3 + HO, SO_3$). This, when combined with barium oxide, forms $C_{12}H_9O, SO_3, + BaO, SO_3$,* and, with zinc oxide, the corresponding zinc salt. The barium salt, when crystallized from its aqueous solution, forms rhombic crystals, with three equivalents water of crystallization, the zinc salt, when crystallized, forms bright lamellas, with seven equivalents crystallization water. The official salt derived by exsiccation is deprived of the water of crystallization; it dissolves in two parts water of medium temperature, and in five parts alcohol of 90 per cent.

The preparation of zinc sulpho-phenate from a not quite pure phenol yields different results. The sulpho-phenic acid is then dark colored, and the solutions of the sales therewith prepared have a pink color. The zinc sulpho-phenate when crystallized has a pink color; when desiccated, a reddish tint. This coloration, however, does not at all impair their medicinal value and their therapeutic action.

These more or less colored solutions of the zinc sulpho-phenate, when near the end of their evaporation, emanate a remarkably fine odor, resembling that of pelargonium. This observation may likely trace to a new source a fine perfume. Some of our most brilliant colors are derived from a similar origin.

Zinc sulpho-phenate combines the therapeutic virtues of zinc sulphate and of phenol. Its solution for injections is obtained by dissolving 1 part of the salt in 150 to 200 parts water.

Light Sulphate of Quinine—A Fraud.†

BY LOUIS STREHL.

A small lot of quinine was recently purchased in this city, bearing the following label: "Light Sulphate of Quinine; Manufactured by Lord Bros., Ludgat. Hill, London." The manufacturer being unknown, the "quinine" was submitted to the ordinary tests for its purity.

A casual glance at the article excited no suspicion, but upon a closer scrutiny, the crystals were found to be colorless rhombic prisms, about a line in length, distinct and not interlaced to such an extent as we see them in sulphate of quinia. The taste was bitter, resembling that of the latter alkaloid. The crystalline shape could be readily distinguished by the naked eye.

The crystals were entirely soluble in cold water, and this solution, when treated with chlorine water and ammonia, gave no characteristic indication of quinia. Chlorine water added to a solution of the salt, followed by ferrocyanide of potassium and afterwards by a few drops of water of ammonia, gave no indication of quinia.

The above results show the entire absence

* No attempt was made to isolate either codeia, narceia, meconia or other well defined principles of opium existing in small quantities

† Translated from Dr. Hager's Pharmaceutischer Centralhalle, No. 1, 1870 (January 6, 1870), by Dr. F. Hoffmann in the American Journal of Pharmacy, March, 1870.

* Nomenclature and notation are that of Dr. Hager.

† From the Pharmacist, March.

of quinia in the so-called "Light Sulphate of Quinino."

An aqueous solution of the salt was precipitated by ammonia and a portion of the filtrate, treated with chloride of barium, gave no precipitate, showing the absence of sulphuric acid. Another portion of the filtrate was slightly acidulated with nitric acid, and treated with nitrate of silver, which produced a copious white precipitate, soluble in excess of ammonia, showing the presence of hydrochloric acid.

It having been demonstrated that the article contained no quinia, further examination was decided on, having in view the identification of the alkaloid. It is freely soluble in cold and much more so in hot water, soluble in alcohol; cold concentrated sulphuric acid dissolves it without change of color, but an odor of hydrochloric acid is developed; on the application of heat the solution becomes light brown; the crystals are freely soluble, without change of color in concentrated hydrochloric and nitric acids. Soluble in chlorine water without change of color, and upon the addition of ammonia a dirty white precipitate is produced not soluble in excess of ammonia, the liquid filtered from the precipitate was of a straw color.

A solution of the salt, to which a few drops of dilute hydrochloric acid were added, when treated with ferrocyanide of potassium, yielded a copious yellow precipitate. Upon the application of a gentle heat the precipitate dissolved, and the solution upon cooling deposited an abundance of beautiful golden yellow crystals.

These tests while showing the absence of quinia, furnish conclusive evidence that the alkaloid is cinchonina, containing traces of cinchonidine.

The reaction with nitrate of silver, already mentioned, shows the alkaloid to be in combination with hydrochloric acid. The "Light Sulphate of Quinino" is, therefore, *hydrochlorate of cinchonina*. The latter salt resembles quite closely in appearance the sulphate of quinia, and it is a substitution which might readily pass unnoticed. The manufacturers have taken advantage of this resemblance to perpetrate an extensive and most reprehensible fraud, and it is to be hoped that their field of operations may be transferred from Ludgate to "Newgate," with the privilege of conducting business in the latter locality for an unlimited period.

Chicago, Feb., 1870.

A new and very delicate test for arsenic has been discovered by Bettendorff. Its sensibility is so great that it is said to be capable of detecting one part of arsenic in a million parts of solution; and the presence of antimony does not affect it. In order to apply this test, the arsenious, or arsenic liquid is mixed with aqueous hydric-chloride (hydrochloric acid), until fumes are apparent; thereupon stannous chloride is added, which produces a basic precipitate, containing the greater part of the arsenic as metal, mixed with stannic oxide.

A sum of about £1,400 has been subscribed, chiefly among men of science, towards the memorial to the late Professor Faraday. It is expected it will take the shape of a statue or monument in the British Museum.

CANADIAN PHARMACEUTICAL SOCIETY.

PRESIDENT, - - - Wm. ELLIOT, Esq.

The regular meeting of the Society take place on the FIRST FRIDAY evening of each month, at the Mechanics' Institute, when, after the transaction of business, there is a paper read, or discussion engaged in, upon subjects of interest and value to the members.

The Society admits as members, Chemists and Druggists of good standing, and their assistants and apprentices, if elected by a majority vote, and on payment of the following fees:

Principals, - - - - \$4 00 per Annum
Assistants & Apprentices, 2 00 "

The JOURNAL is furnished FREE to all members.

Parties wishing to join the Society may send their names for proposal to any of the members of the Society. A copy of the Constitution and By-laws of the Society will be furnished on application.

HENRY J. ROSE, Secretary.

THE CANADIAN Pharmaceutical Journal.

E. B. SHUTTLEWORTH, EDITOR.

TORONTO, ONT., APRIL, 1870.

Correspondence and general communications, of a character suited to the objects of this JOURNAL, are invited, and will always be welcome. The writer's name should accompany his communication, but not necessarily for publication.

Subscriptions will not be acknowledged by letter, as our sending the paper may be taken as sufficient evidence of the receipt of the money.

All communications connected with the paper to be addressed, post-paid,

"EDITOR CANADIAN PHARMACEUTICAL JOURNAL
TORONTO."

New Process for the Extraction of Copper from its Ores.

The process devised by Dr. T. Sterry Hunt, F.R.S., the well-known chemist of the Geological Survey, and Mr. James Douglas, jr., is likely to effect a complete revolution in the treatment of copper ores, in countries where the usual methods of reduction are carried on. It is also to be hoped that Canada will reap a fair share of advantage by the discovery, for although possessing abundant mineral deposits, of the most valuable description, they have heretofore profited us little; as either from lack of enterprise, skill, or fuel; or perhaps from all three causes, our mineral wealth might be almost as advantageously located at the north pole.

The methods devised, hitherto, for the reduction of copper by the moist way, consist of the precipitation of "cement copper," from acid solutions, by means of metallic iron. The metal obtained thus is not only

very impure — containing generally from 20 to 40 per cent. of persalts of iron; but, in practice, the consumption of iron has been found to be unduly large, often amounting to 300 parts for the precipitation of 100 of copper; although, theoretically, but 88.3 should be required. This arises from the unavoidable excess of acid used in dissolving the ore, and from the action of the air on the solution of protosalt of iron formed during precipitation — insoluble persalts resulting.

The invention to which we have referred, which, we may add, has been patented in Great Britain, the United States, Canada, and Newfoundland, is based on the action of a solution of protochloride of iron on the oxide of copper; peroxide of iron, and a mixture of proto and dichloride of copper result. The first of these salts is readily soluble in water, and the second may be dissolved in brine. A bath is made containing the protochloride of iron; either directly by the action of hydrochloric acid on the metal; or by double decomposition between sodium chloride and ferrous sulphate (common salt and copperas); an excess of salt is added for the purpose of dissolving dichloride of copper. The ores, in a pulverized state, are subjected to the action of this solution, either by a maceration of three or four hours' duration, or by percolation. By this means nearly all of the copper is dissolved. A practical trial showed the exhausted ore to contain less than half of one per cent. of the metal. Any silver that may be present is also dissolved, and may be readily recovered by filtration through cement copper. Gold remains behind with the peroxide of iron, and in this state may be easily extracted by treatment with chlorine, after the method of Plattner. The copper is obtained from the solution by the action of metallic iron; 170 to 172 parts of copper may be precipitated by 100 parts of iron. It will thus be seen that the bath is again in the condition for use a second time, and, could the air be excluded, the process might be repeated an indefinite number of times, but a loss of iron is observed, due to the separation of oxychloride. This loss may be made up (1) by the direct application of protosulphate or protochloride of iron, (2) the addition of sulphate of copper obtained from the roasted ore, (3) the use of sulphurous acid.

In the case of sulphuretted ores a preliminary calcination is necessary. This may be done by roasting in kilns, or in the open air, and effects the oxidation of the sulphuret into a mixture of oxyd, and sulphate. Carbonates also require calcination, in order to get rid of carbonic acid; but the non-sulphuretted ores, including the oxyds and oxychloride, require no preliminary treatment.

The following extract from a letter written

by Dr. Hunt to Professor Wurtz, and published in the *American Gas Light Journal*, of New York, gives an account of a practical trial of the process, at Harvey Hill, Quebec:

"The ores holding about 20 per cent. of copper as sulphurets (yellow and purple ore), with a considerable amount of earthy carbonates, were ground, passed through a sieve of forty holes to the linear inch, then roasted in a muffle furnace, after which they held about 5 per cent. of copper as soluble sulphate. The roasted ore was treated in a Freiburg barrel with the prescribed bath of protochlorid of iron and common salt, previously heated to about 212° F., and the mixture agitated during six hours, at the end of which time the solution of the copper was so nearly complete, that the gangue did not contain more than half of one per cent. In several trials on solutions thus prepared, and holding from 60 to 100 pounds of copper, it was found that 100 parts of metallic iron threw down from 170 to 172 parts of pure cement copper. The precipitation is very rapid from hot solution, and in twelve hours the regenerated bath is nearly from copper and fit for the treatment of a fresh portion of ore. To supply by the use of sulphurous acid the loss of the bath in iron salt, we find it preferable to adopt a mode indicated in the American patent (but inadvertently omitted by me in the specification as published by you), which consists in treating by sulphurous acid from the roasting furnace, not the whole of the bath, but the residue of insoluble ferric salt and oxyd left after subsidence, and the withdrawal of the clear copper solution.

"The action of cupric acid on sulphuretted ores of copper, such as copper glance and purple copper, which gives rise to cuprous chlorid, is analogous to that long since observed by Karsten between cupric chlorid and sulphid of silver, which yields cuprous chlorid and chlorid of silver; a reaction which lies at the foundation of the Spanish *patio* process for silver ore. We have had occasion to verify this reaction in the case of certain Canadian copper ores holding silver, which is dissolved together with the copper by our bath, and may be readily separated by filtering the solution through cement copper, which throws down metallic silver. Further experiments on regulus from copper ores containing both silver and gold, show that after thus removing the copper and silver, the gold remains with the ferric oxyd in a condition most favorable for chlorination. These results prove that our new copper process may be advantageously applied to the treatment of copper ores holding one or both of the precious metals."

Researches on the Active Principle of *Gelsemium Sempervirens*.

A valuable contribution to our knowledge of the chemical composition of this plant—the yellow, or Carolina jasmin—appears in the *American Journal of Pharmacy* for January. A case of poisoning by three drachms of the fluid extract, administered to a woman, through the mistake of a druggist, rendered an investigation into the nature of the root necessary. A series of experiments were made by Dr. Wormley, Professor of Chem-

istry and Toxicology in Starling Medical College, the results of which are embodied in the paper before us. The fluid extract, as prepared by Tilden & Co., was selected as the basis of experiment. This preparation was freed from resinous matter, held in solution by alcohol, by concentration to one-eighth its bulk, and subsequent dilution with water. The filtered solution, again concentrated, was acidulated with hydrochloric acid, and agitated with twice its bulk of ether which upon evaporation deposited colorless groups of crystals for which the name *gelseminic acid* is proposed. An average of several experiments gave two and a quarter grains of the purified acid to sixteen ounces of the fluid extract. This new body is possessed of strongly acid properties, completely neutralizing bases, and forming salts, which with the exception of those of the alkalies proper, are sparingly soluble in water. The acid is freely soluble in chloroform and ether, but requires about one thousand times its weight of water for complete solution; it crystallizes in the form of slender needles. If the acid, or any of its salts in the solid state, be treated with concentrated nitric acid, a yellow, or reddish color is produced, which by treatment with excess of ammonia becomes blood red; the author considers this to be a characteristic test; showing distinctively the 10,000th of a grain of the acid. Sulphuric, or hydrochloric acid produce no striking action. Caustic potash, soda, or ammonia, when added to the acid, dissolve it, producing a fluorescence which is perceptible in a solution containing 1,000,000th part. The fluorescence resembles that observed in solutions of quinine, with the difference, that in the case of the latter substance the coloration is only observed in an acid solution; whereas, with gelseminic acid the fluorescence only manifests itself in presence of an alkali, disappearing on the addition of an acid. The fluid extract, even when diluted with one hundred parts of acid and treated with an alkali, exhibits a similar appearance.

Gelseminic, gelseminic, or gelsemia, are the names proposed for the new alkaloid which was obtained from the concentrated extract from which gelseminic acid had been extracted by the foregoing process. The liquid rendered slightly alkaline with potash, was agitated with chloroform, which dissolved the alkaloid together with foreign matter; after repeated purifications, gelseminine was obtained in the form of a whitish powder, possessing an intensely bitter taste; of strong basic properties, forming soluble salts; itself but sparingly soluble in water, but dissolving freely in chloroform and ether. The action of a number of reagents was tried, but none was found which could be regarded as prominently characteristic of the presence

of the alkaloid. From experiments made on some of the lower animals, gelseminine appears to be an active and powerful poison; in the case of poisoning alluded to, death resulted from taking about the one-sixth of a grain. The symptoms observed were nausea, dimness of vision, and great restlessness; after the expiration of five hours, the pulse became feeble, irregular, and intermittent, the extremities were cold, the eyes fixed, with inability to raise the eyelids, the pupils expanded and insensible to light. In seven and a half hours after taking the poison, death occurred, without being preceded by convulsions. It will be remembered that only about three drachms of the fluid extract had been taken, and as this quantity corresponds with about one-sixth of a grain of the alkaloid, it would appear that gelseminine is one of the most potent poisons at present known.

Formation of Iron Rust.

In a paper on "the Composition of Iron Rust," read by Dr. Grace Calvert, at the last meeting of the Chemical Society, the author was led to inquire to which of the constituents of the atmosphere the formation of rust was to be chiefly attributed. To demonstrate the matter, clean blades of iron and steel were introduced into tubes filled with various gases, to the action of which they were exposed for a period of four months. The results were as follows:—

Blades in dry oxygen.—No oxidation.

Blades in moist oxygen.—Out of three experiments, only in one a slight oxidation.

Blades in dry carbonic acid.—No oxidation.

Blades in moist carbonic acid.—Slight incrustation of a white colour. Out of six experiments, two did not give this result.

Blades in dry carbonic acid and oxygen.—No oxidation.

Blades in moist carbonic acid and oxygen.—Most rapid oxidation.

Blades in dry oxygen and ammonia.—No oxidation.

Blades in moist oxygen and ammonia.—No oxidation.

These facts led the author to assume that it is the presence of carbonic acid in the atmosphere, and not oxygen or water vapour, which determines the oxidation of iron.

Use of Sulphurous Acid in Distilling and Brewing.

Considerable attention has lately been directed to the use of sulphurous acid, or its salts, in retarding fermentation. The practice of burning a sulphur match in wine casks to check, or stop fermentation, is, indeed, of ancient origin, but not until later years have the sulphites been employed for that purpose. At the present time, the sulphite of lime is largely used in this country for keeping cider "sweet"; and on the continent of Europe,

as well as on this side of the Atlantic, sulphurous acid has received a new application in the process of distillation, being applied, in dilute solution or in the gaseous state, to the mash or wort. By this means the process of extraction may be much prolonged, and the grain can be, consequently, much more thoroughly exhausted, without subsequent "souring."

Until lately, the acid has been prepared by the ordinary method, viz.: deoxidation of sulphuric acid by charcoal, the gas being led directly into a vessel containing the water to be charged. We notice, however, in the *Scientific American*, of April 2nd, that a patent has been secured in Hungary, by Moritz Hatschek, of Pesth, for an apparatus in which the acid is directly obtained from sulphur. The invention consists in the arrangement and construction of a furnace, in which the sulphur is burnt, and a current of air brought to it, and of a detaining chamber and combining column, the latter receiving water at the upper end, and spreading it into a fine spray, in which state it is most apt to take up the evolved gaseous acid, the nitrogen passing off through the column.

Some years ago, Dr. Crace Calvert projected a similar process, it consists in burning the sulphur in a small furnace; conducting the gases through earthenware tubes, surrounded with cold water, and leading them into a wooden column, 40 feet high, and about four feet wide, filled with pumice, through which water is kept slowly trickling. The ascending current of gas becomes, in great part, absorbed by the water, forming a concentrated solution, which is collected in a suitable receiver at the foot of the column. In another process coke is made to take the place of pumice.

Another plan was lately proposed by Stolba; it is said to be economical. Anhydrous sulphate of iron, or copper, is heated with two equivalents of sulphur, giving rise to sulphurous acid, and a sulphide of the metal employed.

New Alloy of Ammonium and Bismuth.

The *American Journal of Science and Arts*, for March, contains a notice of the interesting researches of Dr. Gallatin, of New York, on a supposed alloy of ammonium and bismuth. Ammonium had never yet been seen united with any other metal than mercury. Mercury being the only metal fluid at ordinary temperatures, should another alloy be formed it would be solid. Some bismuth was melted in a porcelain dish and alloyed with sodium by dropping a piece of that metal on the clear surface of the fluid bismuth. Chlorid of ammonium was then dust-

ed on the fluid alloy, and then water added in a fine quick stream. The bismuth swells, appears pasty and porous, and then congeals. Abundance of hydrogen escapes from the water, and the ammoniacal odor is set free. This body must now be dried. If it be placed near the ear, a distinct crackling noise will be heard, a phenomenon which endures for some days. To ascertain if this be ammonium escaping from the bismuth, the body was placed beneath the surface of water, when bubbles of hydrogen escaped, easily to be collected and recognized; the ammonia, if any, must have been absorbed by the water. To test for this red litmus-paper was placed in the liquid. Wherever the currents from the bismuth struck it a blue spot became visible. On dissolving sulphate of copper in distilled water and placing the well-dried bismuth therein, the characteristic flocculi of ammonio-sulphate of copper appeared at once.

It remains to show that the hydrogen escaping is in the nascent state. There was not enough of it to test with phosphorus. The bismuth compound, when placed in a solution of sulphate of copper, becomes rapidly coated with metallic copper. Now bismuth unalloyed will not precipitate copper from its sulphate. To test if the precipitation of the metallic copper was due to the presence of nascent hydrogen, an alloy of bismuth and sodium was made and dipped in a solution of sulphate of copper. It instantly became coated with that metal, owing to the nascent hydrogen escaping from the water. The hydrogen was therefore escaping in the nascent state from the bismuth and ammonia, and therefore it was a true alloy of bismuth and ammonium. If the temperature of this alloy be raised, it will rapidly decompose with a crackling noise. On one occasion it exploded, sharply scattering the metal. The loud crackling noise produced by this substance may be heard for many days after it is made. That there is no mere surface-action is shown by the pores which are formed by the escaping gases in both cases. In the amalgam these pores may be seen produced by the escaping ammonium long after the water has exhausted the sodium. In the mercurial body the pores are evanescent; in the case of bismuth they remain, and may be examined at leisure. These are different phenomena from those displayed by spongy platinum when it forces hydrogen and oxygen to combine.

Preparation of Cold Cream.

Mr. J. B. Moore (*Am. Jour. of Pharm.*) suggests the following formula as producing a superior article, of good keeping qualities, and possessing, at ordinary temperatures, a good consistency. Should, however, the effect of the season or climate render the ointment of too firm consistence, the quantity of wax may be reduced:

R Ol. Amygdal. Dulc.....f.ʒxss.
Cetaceiʒiij. ʒvj. (Troy).
Cera Albæ.....ʒx.
Ol. Rosæ.....gtt. vj. vel. gtt. x.

The first three ingredients must be melted together by means of a water bath, and, if necessary, strained; stirring assiduously

until congelation. The essential oil which may be varied to suit the taste, is then added, and vigorous beating applied until the ointment is of a snowy whiteness. Stray portions, which might harden on the side of the dish, must be rubbed smooth on a slab before being added to the rest.

CANADIAN PHARMACEUTICAL SOCIETY.

The regular monthly meeting of the Society was held at the usual place, on Friday evening, 1st inst., with the Vice-President in the chair.

After reading and adoption of minutes of last meeting, the following new members were elected.

PRINCIPALS:

G. J. B. Lang.....Owen Sound.
J. T. Robinson.....Oshawa.

ASSISTANTS:

D. F. Lucas.....Gananoque.
W. Brown.....Owen Sound.
Jos. Bell.....Meaford.
W. A. Card.....Orono.

Mr. Shuttleworth read his report of the progress of the Journal for the past year, Mr. Elliott, on behalf of the printing committee, said that not having completed their examination of the present position of the undertaking, so as to place it before the Society clearly—and as the current number of the journal terminated the present arrangement with the editor, he asked the Society in the following resolution to place the future course of action in the hands of the printing committee, promising a full report at a future meeting.

Moved by Mr. R. W. Elliott, seconded by Mr. Dilworth: That the printing committee be empowered to act in regard to the future publication of the Journal, as they may think best, subject to the approval of the Society.—Carried.

The President then read a letter from Mr. Brown, of Edinburgh, in acknowledgement of his election to honorary membership, and the editor was advised to write him.

In pursuance of a notice of motion given at the January meeting, regarding the amending of the Constitution and By-laws so as to conform to the Pharmacy act, a committee was appointed; consisting of Messrs. Brydon, Shuttleworth and Rose, to report on the alterations required.

The President said that from a conversation he had with one of the leading members of the Montreal Chemist's Association, there seemed to be some doubt of the power of the Local Legislature to pass such an Act, as it seemed to interfere with trade and commerce which were subject only to the legislation of the House at Ottawa.

Mr. R. W. Elliott said that he had brought that question up, while endeavoring to obtain legislation last session, and the opinion of the Hon. M. C. Cameron was that it came within the powers of the Local house, in the same way as laws restricting the sale of liquors, &c. The necessity for early and persistent action on the part of the Legislative Committee, was then urged by several of the members and approved by those members of the Committee present.

Meeting adjourned.

H. J. ROSE,
Secretary.

Selections.

Cochineal.

An insect of the genus of *Hemiptera*, by far the most important of which is the coccus cacti, or cochineal cactus, so celebrated for the beauty of the color which it yields. This species is a native of South America, and was for a long time exclusively confined to Mexico, where it feeds on a species of cactus.

It was introduced, about eighty years ago, into our East Indian territories by an enterprising individual, an officer in the Madras army. About sixty years ago, the Spaniards regarded this insect as being invaluable to them, producing a revenue to Spain larger than that afforded by their gold mines. It was the desire of the Honourable East India Company to introduce the cochineal into their territories at the above period, and large reward was held out to speculative adventurers to tempt and encourage them to colonise the insect on their various estates. But they could not succeed in their new undertaking. It may be deemed somewhat remarkable, when the great value of the cochineal insect is considered, that the natives have never encouraged it as an article of commerce. Certain European adventurers have, however, endeavoured to turn the insect to a good account; but they have, all of them, signally failed in producing cured samples of any size, so as to wear a favourable complexion in the London market, when placed in juxtaposition with the *grana fina* of Mexico and Oaxaca, and as none of the parties had had an opportunity of witnessing the mode in which the *nopaleries* in South America were managed, they were quite at a loss how to treat the insect.

Some conjectured that the fly was a wild species of the *coccus cocciniferus*, whilst others considered that it was the wrong plant upon which it was reared in India; and on the other hand, it was decided that the climate was uncongential to the prosperity of the insect, which, although it proved highly prolific, yet never arrived at any size. The Indian cochineal yields a stronger dye than that of New Spain, and is in every way calculated to prove a truly valuable article of commerce, if it could be brought to a size equal to that of the insect of New Spain or South America. A gentleman, living on the Coromandel coast, fed a small colony of these insects upon the *cactus inermis*, a species of *cactus opuntia*, perfectly free from thorns, and which it is said the South American coccus exclusively feeds upon, but it quickly perished under the bite of the insect, although

the animalculæ were not usually numerous; and he was led to imagine that the large acicular thorns which protruded from the lobes of the prickly pear (for the leaves are truly lobate) would, if carefully removed, tend considerably to promote the size of the insect in its growth. He also, among several other experiments he adopted in his treatment of the cochineal, rescinded a portion of the exuberant foliage of the plant, and diminished the quantity of larvae on the leaves so as to afford the shrub a more favorable opportunity of struggling against the innovations of the insect incubus. In this latter experiment he proved successful; and he observed as the vigor of the plant developed in a corresponding ratio did the cocci increase in size, nor were they enveloped so thickly in flocculent matter as those which were allowed to live unattended to and neglected.

Cochineal was fetching at this time in Calcutta eleven and twelve rupees per seer of two pounds, which is at the rate of 12s. per pound; and yet, strange to say, the insect then abounded throughout India; and, with a little pains and attention bestowed upon it, might be converted into a valuable article of commerce, and would, there can be little doubt, in time, expel the presence of the Spanish insect from the market.

The female, or officinal cochineal insect, in its full-grown, pregnant, or torpid state, swells or grows to such a size, in proportion to that of its first or creeping state, that the legs, antennæ, and proboscis are so small, with respect to the rest of the animal, as hardly to be discovered by the naked eye; so that, on a general view, it bears a great resemblance to a seed or berry; hence arose that difference of opinion which at one period subsisted among writers, some maintaining that cochineal was a berry, while others contended that it was an insect.

When the female insect is arrived at its full size, it fixes itself to the surface of the leaf, and envelopes itself in a kind of white down, which it spins, or draws through its proboscis, in a continued double filament. The male is a small and rather slender two-winged fly, about the size of a flea, with jointed antennæ, and large white wings in proportion to its body, which is of a red colour, with two long filaments proceeding from the tail. When the female insect has discharged all its eggs it becomes a mere husk, so that great care is taken to kill the insect before that time, to prevent the young from escaping. The operation of collecting the insects is exceedingly tedious, and is performed by women. "Formerly," says Mr. McCulloch, "it was in Mexico only that it was reared with care, and formed a valuable article of commerce, but its culture is now more or less attended to in various parts of the West Indies."

The insect, of which there are about 70,000 in a pound, being detached from the plants on which they feed by a blunt knife, are put into bags and dipped in boiling water to kill them, after which they are dried in the sun. It is principally used in dyeing scarlet, crimson, and other esteemed colors. The watery infusion is of a violet crimson, the alcoholic of a deep crimson, and the alkaline of a deep purple, or rather violet hue. It is imported in bags, each containing about 160 lbs. Messrs. Daniel Judson and Son, of Southwark Street, inform us that no less quantity than 23,775 bags of cochineal have been delivered from the Lon-

don warehouses for home consumption and for exportation during the first nine months of the current year. The stock at the end of October being 6,071 bags. In the year 1814, only 1,200 bags were imported, when the price obtained varied from 36s. to 39s. per lb., the present prices being about 3s. 3d. to 4s. per lb.

The cochineal most esteemed for dyeing is called "black grain," being of a dark mulberry colour; while that called "silver grain" resembles in colour the ore from which it derives its name. This latter we should consider the cochineal of the Pharmacopœia.

Messrs. Judson and Son have kindly volunteered to supply, free of charge, small samples of the various kinds of cochineal to any of our friends who are collecting specimens, or are otherwise interested in the subject of our article.—*Mather's Price Current*, Dec. 1869.

Researches on Tobacco.

From the investigations of Mr. Schloesing, reported in *Les Mondes*, and abbreviated in the *Chemical News*, it appears that the inorganic substances contained in tobacco are Potassa, lime, magnesia, oxides of iron, and manganese, ammonia, nitric, sulphuric, hydrochloric, and phosphoric acids, and silica. The organic substances are:—Nicotine, $C_{10}H_{7}N$; malic, citric, acetic, oxalic, pectinic, and ulmic acids; nicotianine; a green and yellow resin; wax and fat; albumenoid substances; and cellulose. Nicotianine, also known as tobacco camphor, is a fatty substance, exhibiting the pleasant aromatic odour of tobacco-smoke, and having an aromatic bitter taste. Nicotianine is probably identical with coumarine. Nicotine is an organic base; it is, in the pure state, a colorless, oily liquid, of very acrid taste, soluble in water, alcohol, ether, and oil; and a most dangerous poison. According to the author, the quantity of this substance contained in 100 parts, by weight, of dry, unmanufactured tobacco-leaves, ripped from the stems, varies considerably, even for tobacco cultivated in France, from 7.96 to 3.24 per cent.; for American tobacco, the quantity varies from 6.87 to 2.29 per cent.; while the so-called Habana (properly Cuba) tobacco contains only 2.0 per cent. of this alkaloid. Snuff, which contains on an average 33 per cent. of water, contains 1.36 per cent. of nicotine. The quantity of ash contained in tobacco in dry state varies from 19 to 27 per cent. 100 parts of the ash contain:—Potassa, 29.96; soda, 2.76; lime, 39.53; magnesia, 9.61; chloride of sodium, 9.65; sulphuric acid, 2.78; silica, 4.51; phosphate of peroxide of iron, 4.20. The more or less easy combustibility of tobacco does not depend upon the quantity of nitre it contains, since experiments made by the author have proved that the Kentucky tobacco, which contains a large quantity of saltpetre, burns badly, while Java, Maryland, and Hungarian tobacco, which contain hardly any saltpetre at all, burn very well. The author found that tobacco which burns badly, or not at all (at least, not so as to be suitable for the use of smokers) burns very well after having been steeped for some time in an aqueous solution of an organic potassa salt (oxalate, malate, citrate, or tartrate answer the purpose), and next dried. A well-burning tobacco becomes badly-burning, or even non-combustible, by being steeped in aqueous solutions of sulphate of lime, chloride of

calcium, magnesia, or ammonia. The rationale thereof lies in the fact that the organic salts of potassa just alluded to yield, on combustion, a very bulky, porous, and light coal, which burns off readily on excess of air. This paper contains some very important facts relating to the preparation of tobacco and snuff, obtained on a very large scale, working with some hundreds of thousands of tons annually.

Chloroform and its Behaviour towards Light and Air.

According to M. Hager, chloroform of commerce contains, besides real formyl-chloride, other chlorinated compounds, which are not readily separated therefrom. This is proved by the fact that, after the separation of alcohol and water, which are invariably present in all commercial chloroform, a fluid is obtained which begins to boil at from 60° to 61°, and at the end of the distillation boils at 65°. By repeated fractional distillation, it is possible to obtain pure chloroform, which can only be properly tested for by means of its boiling point and specific gravity. Pure chloroform is not decomposed by the action of light only. When chloroform is exposed to the direct action of the sun's rays, it becomes decomposed, exhibits an acid reaction to test-paper, and there are found, among its products of decomposition, hydrochloric acid, chloroxycarbonic acid, formic acid, and free chlorine. Chloroform is decomposed when air has access to it, even in the dark, although only slowly. A quantity of from 0.75 to 1 per cent. of alcohol added to chloroform, is sufficient to act as a preservative for keeping chloroform for years, even when exposed to daylight. Chloroform, even if it does not exhibit an acid reaction, may be in a state of decomposition. This decomposition can only be detected by the reaction such chloroform exhibits with ammonia, which then yields with it vapours of chloride of ammonium. The cause and products of this decomposition are not ascertained. The boiling point and specific gravity of chloroform are variously determined by different authors:—*The Pharm. Austriaca*.—Boiling point, 63.5°; sp. gr., 1.49 to 1.5. Dr. Strecker—Boiling point, 61°. M. Limpricht—Boiling point, 62°. M. Biltz—Boiling point, 62.05. Specific gravity—At 10.2°=1.5085; at 15°=1.5020; at 17.75°=1.4971; at 20.0°=1.4936.—*Pharm. Zeits. für Russ. in Chem. News.*

Alkaline Cantharidates and their Application.

MM. Delpech and Guichard communicate an interesting article on the alkaline cantharidates and their application as blistering agents, to the *Bulletin Thérapeutique*. The authors condemn the vesicating-plaster of the Paris Codex for the following reasons:—The quantity of cantharidin contained therein is variable, in some cases there is none at all, owing to the use of very old cantharides; the fatty matter present which dissolves the cantharidin causes the medicament to run over the skin, and thus extends the action beyond the limits imposed by the medical man; moreover, the cantharidin is by this means sometimes introduced into the system in spite of the measures which may be taken to prevent it; lastly, in the opinion of the authors, the resins present are irritating, and have an odor almost insupportable to some

persons. To obtain a good blister they think that the fat and resin should be eliminated and a known quantity of cantharidin introduced, so as to obtain a plaster which shall produce a definite effect. The easy solubility of cantharidin itself renders it unfit to be used in the separate state for this purpose, therefore, the authors instituted experiments in reference to the compounds of cantharidin described by Massing and Draggendorf in 1867. The results of these experiments led them to adopt cantharidate of potassa, a salt of the hypothetical acid $C_{10}H_6O_4 \cdot 2HO(O=8)$, of which cantharidin $C_{10}H_6O_4$, is the anhydride; 98 parts of cantharidin give 163 parts of cantharidate of potassa. This salt is insoluble in chloroform and ether, is soluble in about 11 parts of boiling water, in 24 of cold water, in 110 of boiling alcohol, and is nearly insoluble in cold alcohol. Taking advantage of its slight solubility in cold alcohol, MM. Delpech and Guichard prepare the salt by dissolving 2 grammes of cantharidin in 150 grammes of alcohol slightly warmed, and adding 1.60 grammes of caustic potassa dissolved in a very little distilled water; the mixture immediately solidifies and the alcohol is separated by pressure and filtration. The plaster is prepared by spreading the following composition on thin sheets of gutta-percha, so that each square decimetre shall contain one centigramme of cantharidate of potassa:—

Gelatine	2 grammes.
Water	10 "
Alcohol	10 "
Cantharidate of Potassa...	20 centigrammes.
Glycerine.....	q. s.

These blisters should be slightly moistened with water before application; they gave the best of results in the hands of a number of medical men enumerated by the authors.—*Sidney W. Rich in the Chemist & Druggist.*

Toilet Soaps.*

The soaps consist either of very pure ordinary curd soap, or of soaps prepared by the cold process with lard, beef-marrow, or sweet-almond oil, and perfumed in either case with various essential oils. To refine an ordinary soap—which should, of course, be as free as possible from colour and impurity—for toilet purposes, it is reduced to shavings, and melted over a water-bath with rose and orange-flower water and salt, 24 lbs. soap being thus mixed with 4 pints of rose water, 4 pints of orange-flower water, and 2 large handfuls of salt. The next day, if entirely cooled, the soap is cut up into small bars and dried in a shady place, then melted anew in the same quantities of rose and orange-flower water, and strained; afterwards cooled and dried again. This done, the soap will be free from bad odour. It must be powdered and exposed for several days to the air, but protected from dust. It is then ready to receive the intended perfume, and to be moulded and pressed into the desired forms.

Another method is to melt 6 lbs. of best white soap in 3 pints of water, and when liquid to strain it through a linen cloth. It is then placed in a kettle with a pint of water and a table-spoonful of salt; a brisk fire is kindled under it; and the contents are whipped or stirred to make them foam and froth. The fire is then put out; the balling

* From the article on "Soap," in Mr. Watts' *Dictionary of Chemistry*.

continued till the mass is sufficiently inflated; the fire again kindled, and the kettle kept on till its contents swell and foam. It is then emptied into the cooling frames, and after solidification, taken out, cut into cakes, and pressed.

The perfumes used are chiefly volatile oils, viz., the oils of roses, bergamot, mallow, lavender, thyme, rosemary, lemon, verbena, vanilla, bitter-almond; nitro-benzine is also used instead of the last-mentioned oil.

Toilet soaps are coloured blue with ultramarine, red with vermilion, brown with an alkaline solution of burnt sugar. A peach-blossom tint is said to be produced by adding a little cream of tartar to soap which has been perfumed with bitter-almond oil.

Toilet Soft Soap or Shaving Cream is made by gradually beating 50 lbs. of lard with 75 lbs. of caustic potash-lye, marking 17° Bm. S. G. 1.126.

Glycerine Soap, which is used as a toilet soap for softening the skin, is made by mixing glycerine with ordinary soap when transferred to the frames.

Light or Flotant Soap.—This soap is prepared by threshing or agitating a solution of soap, to which one-fifth or one-sixth part of water has been added, with a rouser or paddle-wheel, until the latter has risen to twice the height of the soap solution, and then transferring it to the moulds. A soap is thus obtained inflated with air, which gives it sufficient buoyancy to float on water.

Transparent Soap is prepared by drying ordinary soap in a stove, dissolving it in hot alcohol, leaving the solution at rest to allow the impurities to settle down, or removing them by filtration, the filter being supported on a funnel surrounded with hot water, then distilling off the alcohol till the residue acquires such a consistence as to solidify when cooled in metallic moulds.

The Production of Sulphur in California.

According to the *Alta California*, the production of sulphur and manufacture of its compounds in California, are rising in importance. The chief supply of the world is obtained from the sides of Mount Etna, in Sicily, and the States used the Sicilian brimstone until lately. Now the sulphur works on the shores of Clear Lake produce four tons a day, as much as the coast can consume. The freight from the Mediterranean, the increased charge on account of the combustible nature of the material, and the necessity of keeping large stocks on hand, so as to prevent any disturbance of trade in case a cargo should be delayed or lost, give decided advantages to the home manufacture.

The Sicilian brimstone cannot be had in California for less than four cents per pound, and the domestic article is sold for three and a half cents. Clear Lake occupies the crater of an extinct volcano, and the evidences of volcanic action are abundant in the vicinity. The triangle formed by the lake, the Geysers, and St. Helena—each about twenty-five miles from the other two—abounds with volcanic scoria, trap, lava, obsidian, tufa, warm springs, and other remains of eruptions, and signs of subterranean heat at no great distance from the surface.

The sulphur bed of Clear Lake is about eight miles from the southern end, on the eastern shore, only a few hundred yards from the water. There is a bank resembling ashes,

in which there are numerous alkaline and sulphur springs, and also, vent holes from which sulphurous fumes escape. These holes are surrounded by beautiful crystals of pure sulphur deposited from the fumes rising from below. The earth containing about fifty per cent of sulphur, is placed in an iron retort, which is heated to a high temperature, so that the sulphur is driven off in fumes into a receiver, when it settles in a liquid form, and runs out into pine boxes, two feet long and a foot square. It is as pure as the Sicilian brimstone, but the latter comes in sticks, which are more convenient for handling, when small pieces are wanted.

The lump sulphur is used chiefly for making powder and sulphuric acid, which last is employed in making blue-stone, giant powder, nitric acid, and muriatic acid, and in refining gold and silver. The consumption of sulphuric, nitric, and muriatic acid on the coast, amounts to 2,000,000 lbs., and the entire demand is supplied by home manufacture.

Lately the production of flowers of sulphur has been commenced at Clear Lake. The fumes passing off from the retort instead of being carried into a small hot receiver as for brimstone, are led into a large cool chamber, in which they condense into a slaty, snowlike condition. This form of sulphur will be needed in large quantities next spring and summer, as a cure for the mildew which attacks the vines and did great damage in many of the vineyards last year.

The Lower Lake *Bulletin* says: There are no less than eight new mines of quicksilver and sulphur now being opened up in this vicinity (southern part of Lake County); the three mines of these minerals now in daily operation employ over 300 men. With eight more in practical operation, nearly 900 men and several millions of dollars in property valuation will be added to this part of the country. And these are not possibilities, they are probabilities. The mineral is there; men are employed there now in running tunnels and holding the ground, and time will develop them.—*Scientific American*.

Use of Opium in the Diseases of Children.

Dr. Temple in a recent paper on the above subject argues in favor of a more liberal administration of opium in this class of patients; that it is a mistake to suppose that children do not "bear opium well." He had given the $\frac{1}{2}$ of a grain to children twelve and fifteen months old without any unpleasant results, but on the contrary with beneficial effects. He knew that the sense or rather the prejudice of the profession was against the liberal use of opium in diseases of children. In that position he believed the profession to be wrong. Not many years ago bloodletting was resorted to in almost every case, and it was also the doctrine that you had to salivate your patients in order to cure them. He would ask where is the intelligent medical man who would now advocate such a doctrine? Time and experience had convinced the profession that it was wrong in its position respecting these two remedies—and if wrong in one thing could it not be wrong in another? Upon the plea that children do not bear opium well, he believed it to be as erroneous to withhold the soothing influence produced by the administration of a dose of opium, as it was formerly erroneous to advocate the

doctrine of indiscriminate bloodletting and salivation. The opposition to the use of opium in the diseases of children was based upon the "hypothesis, which prevails among some of the best minds of the profession, that there exists a difference in the nervous organization of the child and adult. This difference can only be in the degree of the progressive development of the two organizations—their natures are essentially the same. This being true, everything else being equal, the same agencies being used in both organizations, results exactly similar should follow. I have prescribed opium for children of all ages, and almost every variety of complaint. Size of dose varying from the 1-25 to 1 8 of a grain, being controlled by the age and development of the child."—*Philadelphia Med. and Surg. Reporter*.

A New Insect Poison.

M. Cloez, who is engaged at the garden of the Paris Museum, has invented, according to *Scientific Opinion*, what he considers a complete annihilator for plant lice and other small insects. This discovery is given in the *Revue Horticole*, with the indorsement of its distinguished editor, E. M. Carriere. To reduce M. Cloez's preparation to our measures it will be sufficiently accurate to say, take 3½ oz. of quassia chips, and 5 drachms of stavesacre seeds, powdered. These are to be put in 7 pints of water, and boiled until reduced to 5 pints. When the liquid is cooled, strain it, and use with a watering-pot or syringe, as may be most convenient.

We are assured that this preparation has been most efficacious in France, and it will be worth while for our gardeners to experiment with it. Quassia has long been used as an insect destroyer. The stavesacre seeds are the seeds of a species of larkspur, or Delphinium, and used to be kept in the old drug stores. Years ago they were much used for an insect that found its home in the human head, but as that has fortunately gone out of fashion, it may be that the seeds are less obtainable than formerly. The stavesacre seeds contain delphine, which is one of the most active poisons known and we have no doubt that a very small share of it would prove fatal to insects.—*Scientific American*.

Historical Notes on Manna.

At a late meeting of the Pharmaceutical Society, Mr. Daniel Hanbury, F.R.S., alluding to the doubtful nature of the substance provided for the sustenance of the ancient Israelites, and termed by them manna, and the origin of the substances known in subsequent ages under that name, the author mentions the fact that modern manna is derived from a species of ash cultivated in Calabria in Sicily. His inquiries had, however, elicited the curious fact, that in the early history of Sicily no mention is made of manna as a production of the island, and it was this and other results of his researches which formed the body of his interesting communication to the Pharmaceutical Society. With regard to the manna described in the Book of Exodus as falling from heaven the author considers that, accepting the Mosaic account as the narrative of a real event, it may be safely affirmed that no phenomena is known which is at all adequate to explain it, although the notion of the

ancients, that manna is of the nature of dew, and falls from the sky still lingers in the East.

The author was, however, specially anxious to ascertain the period at which ash-manna was first collected, to elucidate which point he had investigated the works of many authors of early times. Another point of interest was the custom of making incisions in the trees to promote the exudation of the manna, which had given rise to much controversy about the middle of the sixteenth century. We cannot, in conclusion, do better than recapitulate the points in the history of manna upon which Mr. Hanbury's valuable efforts have succeeded in throwing light.

1. That the manna known in Europe in very early times was probably of Oriental origin.

2. That the manna of the ash began to be collected in Calabria in the first half of the fifteenth century.

3. That the practice of making incisions in the trees in order to promote the exudation was not commenced until about the middle of the sixteenth century, previous to which period the only manna obtained was that which exuded spontaneously.

4. That although the existence in Sicily of a mountain called by the Arabian name, *Gibilmanna*, would seem to indicate that manna was collected during the period of Mussulman rule in that island, evidence has not been produced to prove the fact, but that, on the contrary, it appears that manna was gathered in Calabria long anterior to its collection in Sicily.

Professor Bentley agreed with Mr. Hanbury in dismissing the question of the origin of Israelitish manna.

Mr. Haselden alluded to the various applications of manna a few years back. He considered its only present use was to make blue pills, for which purpose it served admirably.

Mr. H. Sugden Evans asked if Mr. Hanbury had ever met with any artificial manna. He had himself met with a sample from France.

Mr. Hanbury had heard of, but had never seen, artificial manna. Conceived it would be difficult to imitate its natural appearance.

Mr. Morson had known artificial manna to be made, or rather he had known common cheap manna to be purified, and so moulded as to exactly resemble the best natural article.—*Chemist and Druggist*.

Three New Anæsthetics—Iodal, Bromal, and Bromiform.

Scarcely had the name of chloral become familiar to the scientific world, when three new substances of the same character are announced by Dr. Rabuteau, of France, (*Gaz. Hebdomadaire*, Oct. 22.) Iodal is produced by treating iodine with alcohol and nitric acid. Bromal differs from chloral in having the chlorine of the latter replaced by bromine. Bromiform is made by decomposing bromal with potassa. In its chemical and anæsthetic qualities it is very analogous to chloroform, and may be mistaken for it. But chloroform makes a violet colored solution of iodine, while that of bromiform is a magnificent carmine. Dr. Rabuteau is inclined to place the latter before chloroform. He thinks it will produce anæsthesia without sleep so profound and dangerous. Bromal is irritating to the nose and eyes. Iodal has the same effect.

The latter is unmanageable in consequence of boiling at 77° F. Injected in the rectum of a dog, it produced anesthesia followed by convulsions and death. The breath of the animal was strongly impregnated with the odor. The blood was found black, the flesh red, the spinal marrow and brain congested—presenting the same toxic effects as chloral.—*Pacific Medical and Surgical Journal.*

Injurious Effects of Impure Alcohol Aniline Colors.

Dr. Tillmanns.—The author has examined several varieties of alcohol, and tested the effects upon aniline colours. The most sensitive among these, for impure alcohol, is aniline purple (phenyl-rosaniline). It appears that empyreumatic substances, aldehyde, the peculiar fusel oils due to the substances used in the manufacture of the alcohol—viz., grain (malted or raw), potatoes, the refuse of beet-root sugar manufacture—affect the aniline colours when dissolved in such alcohols and boiled therewith. The best test for the purity of an alcohol is to dissolve in it 1 per cent. of perfectly pure caustic potassa, and to heat the solution, it should only acquire a bright yellow colour. Another test is to dissolve 1 part of the aniline purple alluded to in 50 parts of the alcohol to be tested, and to heat the fluid for some time. If, after half-an-hour's heating, no change is observed, the quality of the alcohol is good; but if the latter is not pure enough, the mixture soon becomes turbid, and assumes a red colour. Aldehyde is often present in alcohol, especially if it has been purified by means of charcoal.—*Bulletin de la Société l'Encouragement pour l'Industrie Nationale*

A Strong Cement for Iron.

To four or five parts of clay, thoroughly dried and pulverized, add two parts of iron filings free from oxide, one part of peroxide of manganese, one half of sea salt, and one half of borax. Mingle thoroughly, and render as fine as possible; then reduce to a thick paste with the necessary quantity of water, mixing thoroughly well. It must be used immediately. After application, it should be exposed to warmth, gradually increasing almost to white heat. This cement is very hard, and presents complete resistance alike to a red heat and boiling water.

Another cement is to mix equal parts of sifted peroxide of manganese and well-pulverized zinc white, add a sufficient quantity of commercial soluble glass to form a thin paste. This mixture, when used immediately, forms a cement equal in hardness and resistance to that obtained by the first method.—*Scientific American.*

Manipulation of Plaster of Paris.

Mr. James W. White, in a communication to the *Dental Cosmos* (Philadelphia) writes:—Complaints are frequently made of unsatisfactory results in the manipulation of plaster of Paris, many of which are doubtless due to a failure to observe some necessary precautions.

Plaster should always be kept in a dry place—never in a cellar—and in winter time in a warm room. It will not work satisfactorily if cold, nor if mixed with cold water. Premising that the article is good, the

observance of the following directions should insure success:—Put the required quantity of tepid water into the mixing vessel, and add the plaster gradually, stirring constantly, until the proper consistency is obtained. If too thin, it will not set as quickly. If for taking impressions, it should be quite thick, and the addition of a small pinch of salt will facilitate the setting, but the cast will not be quite as hard.—*Chemist & Druggist.*

Miscellaneous, &c.

For Dyeing Iodine Night Green on Wool.

Dissolve the dye as follows: Mix 3 lbs. of the iodine green paste well with about 2½ lbs. of cold water; then add successively, 1 lb. acetic acid, 8° Beaume; 80 lb. wafer, of a temperature of 140° Fahr.; and 2 lb. spirits of ammonia, (aqua ammonia), stirring the mixture well all the while, and filtering the same before use. Bring the dye-bath to the boiling point; put in as much of the solution as is necessary for the shade required, and dye for half an hour, letting the bath cool off in the meantime. Then have a second water-bath of 140° Fahr., ready prepared as follows, viz. For every 20 lbs. of wool, add ½ lb. sulphuric acid, 66°; and ½ lb. perchloride of tin crystals, the latter previously dissolved in an equal quantity of water. Take the goods from the first bath, without washing, into the second bath; turn them in it for 15 minutes, and the green will develop vividly. For yellowish tints, shade off with picric acid, which must be added to the second bath and dyed quickly. By this method, 1 lb. of iodine green paste will dye 12 lbs. of wool medium shade. Preserve the first bath, inasmuch as one-third of the dye remains in it, which circumstance is important in renewing the bath. Use same, requiring one-third less dyestuff, when feeding it up for the second lot.

Action of Nitric Acid upon Extract of Indian Hemp.

Messrs. Bolas and Francis found that when the resinous extract of Indian hemp was treated with nitric acid, sp. gr. 1.32, a violent action, accompanied with a copious evolution of nitrous fumes, took place. When the action had subsided, the flask was heated for five hours in a water bath; the residual resin was again treated with nitric acid, sp. gr. 1.420; the clear acid solutions were then evaporated to dryness on the water bath, the resinous portion remaining in the flask being again treated with nitric acid, and so on until the whole was dissolved. The residues obtained on evaporating these acid solutions were then washed with water and dissolved in spirit, from which it crystallized in long flat prisms. When pure it is white, and gives an alcoholic solution neutral to test paper. It does not contain nitrogen. It gave on combustion numbers agreeing with the formula $C_8H_6O_2$. The acid liquors which have deposited "oxy-cannabin" yield on further evaporation a small quantity of an acid substance, which crystallizes in plates.—*Medical Press and Circular.*

Camphor Water.

M. Jeannel.—The question of the solubility of camphor in water has been often discussed. According to the author, an alcoholic solution of camphor was made containing 0.375 gm. per c.c.; and a litre of water at

15° does not dissolve more than 0.75 gm. of camphor from this solution after twenty-four hours' contact and frequent shaking. The author states that alcohol does not increase perceptibly the solubility of camphor in water; alcohol at 20° only dissolves 2.437 grms. of camphor, and at 35°, 6 grams of that substance per litre of alcohol.—*Chem. News.*

Coal Tar Colours.

One hundred lbs. of coal tar yield—3 lbs. of raw, and 1½ lbs. of pure benzol. This quantity yields—3 lbs. of nitrobenzol, 2.25 lbs. of rosaniline, 3.37 lbs. of aniline red, and 1.12 lbs. of fuchsine; 1 lb. of pure fuchsine requires 3,000 lbs. of pit coal. The quantity of coal-tar produced by the entire number of gas works of Europe is sufficient to yield, annually, 53,000 cwts. of fuchsine.

Explosion Caused by the Incautious Making-up of a Medicinal Preparation.

The following prescription was handed to a pharmacist.—Chlorate of potassa, 8; hypophosphite of soda, 4; simple syrup, 62; water, 125. The operator put the dry salts in a mortar, and commenced rubbing them vigorously, when a most violent explosion ensued, whereby the mortar was smashed to atoms and the operator seriously wounded. The proper course would have been to dissolve each of the salts separately in water.

Phenyl Paper.

This article would be useful for packing meat and other substances liable to decay. It can be prepared by fusing five parts stearic acid at a gentle heat, mixing well with two parts carbolic acid and five parts melted paraffine, and stirring until the whole has become solid, and applying the same manner as wax paper is made.

Test for Copper and Iron.

It is stated in the *College Courant*, that an alcoholic tincture of logwood furnishes a test for copper and iron, of extraordinary delicacy; the hematoxylin combining with either metal, producing a pure blue color. By this test an appreciable result is obtained in water having only one per cent of iron or copper in twenty millions; and it will give an indication when galls or prussiate of potassa fail. When the water has been thus rendered blue, the coloring matter will precipitate in light flocks after several days, a deposit being thrown down when the water contains only one part of metal in five million parts of water.

Cheap Oxygen.

A correspondent of the *Scientific American* describes the process of M. M. Montmagnon and Delaire for obtaining oxygen by absorption by charcoal. The method of obtaining it is by exposing charcoal to the air, and then saturating it with water. 100 litres of charcoal will absorb 925 litres of oxygen, but only 705 litres of nitrogen. On saturating it with water, all the nitrogen escapes, save 55 litres, while 575 litres of oxygen remain. The residual gas is collected by means of an air-pump. The gas thus obtained is comparative pure oxygen; but if it is desired to make it free from all nitrogen it may be subjected to the same operation again, until the whole of the nitrogen has escaped. Oxygen, in large quantities, is prepared in this way

very cheap; all that is required is the apparatus. The charcoal may be used in subsequent treatments, as it does not lose its virtue by the operation.

There are many other substances which absorb oxygen from the air; among which the most prominent are blood, phosphate and carbonate of sodium. These absorb about ten per cent more oxygen than nitrogen, and may be treated in the same way as charcoal.

A New Cement.

The "Journal de Chemie Medicale" states that an excellent cement may be made by dissolving 1 part of amber in $1\frac{1}{2}$ part of bisulphide of carbon. This liquid is applied by a brush to the surfaces it is wished to unite, and on pressing them together, the cement dries almost immediately.

A paper on "The Determination of the Flashing Point of Petroleum" was read by Dr. Reynolds, at a meeting of the Royal Dublin Society, on the 17th ult. His opinion was that twenty-five minutes was the average time for rousing the oil to the flashing-point heat for testing purposes. An electric spark was the most genuine test for the flashing-point, and by it an absolute standard of the quality of oil would be obtained.

It is said that glycerine may be purified by adding one-tenth of its weight of iron filings—allowing the mixture to stand some days, and shaking frequently.

Changes.

A dissolution of the firm of Lyman, Elliot & Co. has taken place, Messrs. Benjamin and Henry Lyman buying out the business carried on on King street, as well as the mills and laboratory, which will be continued under the style of Lyman Bros. & Co.

Messrs. William and Robert Elliot have bought the business of Messrs. Dunspaugh & Watson, and will carry on the trade in all its branches at No. 3 Front street, under the style of Elliot & Co.

Messrs. Dunspaugh & Watson retire from business, having earned their *otium cum dignitate* by an active and prosperous career.

Notes and Queries.

JEWELLER'S ROUGE.—A pure peroxide of iron, perfectly free from grit, and eminently fitted for polishing purposes, may be made by decomposing sulphate of iron by oxalic acid; both substances must be in solution. A precipitate of oxalate of iron falls, [which must be well washed and dried; on being gently heated the salt takes fire, leaving oxide of iron as an impalpable powder.

ARTIFICIAL CAMPHOR.—According to Watts, this compound may be formed by saturating rectified oil of turpentine with hydrochloric acid; keeping the liquid cool; pressing the crystals which form after some hours, and purifying by recrystallization from

hot alcohol. It may be sublimed, like ordinary camphor, which it very much resembles, both in appearance and odor.

A. Z.—AQUEOUS EXTRACT OF JALAP.—An aqueous extract of Jalap made from the root previously exhausted with alcohol, is inert.

Toxicologist.—ARSENIC IN HYDROCHLORIC ACID.—This is a very common impurity; it may be detected best by Marsh's method, for an account of which you had better consult some work on chemistry; or sulphurated hydrogen may be passed through the suspected acid, which, if arsenic is present, will cause a lemon-yellow precipitate of golden orpiment, readily soluble in a solution of carbonate of potash, or soda. This contamination of commercial muriatic acid arises from the use of oil of vitriol obtained from pyrites.

Assistant asks, "What quantity would you give if three grammes of hydrate of chloral were ordered." If placed in such an embarrassing position, and doubtful of the true solution of the mystery, we should feel inclined to throw up our commission until we had qualified ourselves for our position by learning the metrical system of weights and measures, and their equivalents; then we might be able to answer—46 grains.

J. E. K.—RESTORATION OF OIL OF LEMON.—It is said that agitation with a solution of borax, with which some animal charcoal has previously been mixed, will deprive old oil of lemon of its bad odor and color, agitation with boiling water is also stated to be effectual.

B. R.—PEROXIDE OF IRON, the antidote to poisoning by arsenic, is most readily prepared for administration, by mixing about two ounces of liquor ferri perchlor, with a solution of carbonate of soda (*sal soda*) about one ounce of the crystals will be sufficient; a quarter of an ounce of calcined magnesia may be substituted for the soda. This will render ten grains of arsenic innocuous. Ferric hydrate will not keep well, becoming, after the lapse of even a short time, inert as an antidote; after being kept five months its power is diminished to one fourth.

I. Wilson.—LIQ. BISMUTH. ET AMMON. CITR.—You are right in supposing this preparation to contain more than indicated by the official name; it is in reality a solution of citrate of bismuth in a mixture of nitrate and citrate of ammonia. It is to be hoped that the British authorities will change the mode of preparation, as with the bismuth at present in the market, it is very troublesome to make a preparation free from copper.

SOLDERING LIQUID.—A saturated solution of zinc in hydrochloric acid is much prefer-

able to resin or stearine, in soldering tin. It is said that if the solution of chlorido of zinc be neutralized with carbonate, or oxide of tin, the corroding effect of the compound on the seams will be avoided.

Trade Report.

Business, during the present month, has improved considerably. Many large buyers have been down, and have bought pretty extensively, showing their confidence in an improved state of things for the summer months. Payments have also been met with gratifying promptness. The stocks of some descriptions of goods is rather low, and spring arrivals are anxiously waited for.

Prices may be said to have generally advanced, Opium still continues to puzzle buyers and has again raised in price, being quoted at \$12. Balsam Copaiba, slightly higher; Vanilla beans advanced \$2 per lb.; Cardamom and American Saffron, considerably higher; Quinine and Morphia very scarce; English oil of Lavender, higher; Cod Liver oil, slightly advanced. Those articles which favor buyers are Citric Acid, Chiratta, Canada Balsam, and the oils of Citronella, Juniper, and American Peppermint. Alcohol has fallen in price to \$1.77½.

Paints and oils, as usual at this season of the year, have been in very brisk demand; linseed oil both raw and boiled, are slightly higher, and turpentine has also advanced in price.

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