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Original and Selected Papers.

ODOURS.*

BY M. FERNAND PAPILLON.

Each of the three kingdoms of nature contains odorous substances. Amongst minerals are found a few solids and several liquids and gases which are endowed with more or less strong, generally rather disagreeable, but characteristic odours. These are elementary bodies, such as chlorine, bromine, iodine, etc.; acids, such as hydrochloric acid and hydrocyanic acid; carbides of hydrogen, such as petroleum; and alkaline substances, as ammonia, etc. The odours that are manifest in animals may nearly all be attributed either to gaseous compounds of hydrogen and carbon, or hydrogen and sulphur, to various solid and liquid acids arising from the decomposition of fats, or to special principles secreted by the glands, such as musk, ambergris, civet, etc. Plants present a great variety of odours; absolutely inodorous plants are very rare, and many that when fresh appear to be so, manifest when dried a perceptible perfume.

*A portion of a paper published in the Pharm. Jour. and Trans., and translated in that journal from a memoir, entitled "Les Odeurs d'apres les Decouvertes Recentes de la Climie et de la Physiologie" (Moniteur Scientific Quesneville xiv. 596 et seq.)

The odours of plants are due to principles very unequally distributed in the various organs; some are solid, as balsams and resins; others are liquid, and are called essences or essential oils. In the majority of cases the essence concentres in the flower, as is seen in the rose and violet; in other plants, such as the vetiver (*Anatherum muricatum*) and orris (*Iris Florentina*), the root alone is perfumed. In the cedar and santal it is the wood, in mint and patchouli it is the leaf, in the Tonquin bean it is the seed, and in canella it is the bark which are the seats of the odorous principles. In the orange the leaves yield the essence known under the name of "petit-grain," the flowers furnish the "neroli," and from the rind of the fruit is obtained the "essence de Portugal." A great number of vegetable odours are obtained from tropical plants, but the European flora furnishes a large proportion, and nearly all the essences employed in perfumery are of European origin. In England are cultivated lavender and peppermint; at Nismes the cultivators pay particular attention to rosemary, thyme and lavender; Nice has the specialty of the violet; Cannes extracts the essences of rose, tuberose, cassia (*Acacia Farnesiana*), jasmin, and neroli;* Sicily gives the citron and orange; Italy the Iris and bergamot.

Modern chemistry has allotted nearly all vegetable odours to three categories, namely, hydrocarbons, aldehydes, and ethers. Apart from a small number among them which contain sulphur—as the essences of the family Cruciferæ—they all present the same qualitative composition, carbon and hydrogen, with or without oxygen. The proportions of these three constituents change, but always in regular gradations, as hydrocarbides, aldehydes, and ethers. Here, as in all organic chemistry, everything depends upon the proportions of the constituent principles; the qualitative constitution imports so little that a variation in the proportional weights of these constituents gives rise to an infinite variety of distinct compounds which have not the slightest resemblance to one another.

But the wonderful properties of the elements, and the mysterious energies with which matter is endowed, are apparent in the still more remarkable phenomenon, known under the name of isomerism. Two bodies, completely dissimilar in their properties, may present absolutely the same ultimate composition, both qualitatively and quantitatively. But, it may asked, in what do they differ? They differ in the arrangement of their molecules. Charcoal and the diamond are identical as to their matter; ordinary phosphorus and amorphous phosphorus are one and the same substance. Now, the inodorous principles of plants supply some extremely curious ex-

* Grasse and Cannes, which are the principal centres for the manufacture of essences in France, produce 150,000 kilograms of perfumed pomades and oils per annum, and nearly 7,000 kilograms of pure essence of neroli, petit-grain, lavender, rosemary, and thyme, a quantity that represents a prodigious number of flowers. Orange-flower water is reckoned by millions of litres.

axples of isomerism. Thus, the essences of turpentine, citron, bergamot, neroli, juniper, savin, lavender, cubebs, peppermint and cloves are isomeric bodies; that is to say, they all have the same chemical composition. Submitted to analysis, all these products yield identical bodies in identical proportions; namely, for each molecule of essence, ten atoms of carbon and sixteen atoms of hydrogen. This is indicated by the common formula $C_{10} H_{16}$. These facts concerning isomerism prove that the qualities of the bodies depend much more upon the internal arrangement and deportment of their smallest parts, inaccessible to our investigations, than even the nature of their matter, and to show how far we yet are from having penetrated into the first conditions of the activity and energy of matter.

Among the odoriferous essences which are ranged by chemists in the class of aldehydes, may be montioned mint, rue, bitter almonds, cummin, anise, fennel, canella, and meadow-sweet. Finally, others are placed in the series of ethers, which are very varied and complex, notwithstanding the constant simplicity of their primary elements.

Such is the chemical nature of the greater part of the odorous principles of vegetable origin. But chemistry has not been limited to establishing the internal construction of these substances; it has been able to reproduce artificially a certain number of them, and the compounds so fabricated in the laboratory are in every respect identical with the products extracted from the plant. The theoretical speculations on the arrangement of atoms, which are sometimes alleged to be useless, contribute not only to make natural laws better known, but they also frequently, as is shown in the present example, give the key to unlock brilliant and valuable inventions. An Italian chemist, Piria, while working in Paris, in 1838, was the first to reproduce a natural aromatic principle. He prepared, by means of reagents indicated by theory, a salicylic aldehyde, which he found to be the essence of meadow-sweet (*Spiræa ulmaria*). Some years afterwards, in 1843, M. Cahours discovered methylsalicylic ether, and showed that it was identical with the essence of wintergreen (*Gaultheria procumbens*). The following year Wertheim obtained the essence of mustard in preparing allylsulphocyanic ether. These discoveries made a great sensation. At the present day chemists possess the means of preparing many other natural essences. Ordinary camphor, and the essences of bitter almonds, cummin, and canella, which we have seen to be aldehydes, are prepared without the camphor-tree, almons, cummin, or canella.

Besides these ethers and aldehydes, of which the identity with the essences of vegetable origin has been demonstrated, there exists among the new compounds of organic chemistry, a certain number of products formed by the union of ordinary alcohol or amylic alcohol with various acids—that is to say, ethers which possess aroma-

tic odours, more or less analogous to those of some fruits; but at present we are unable to say that these odours are due to the same principles. However this may be, the perfumers and the confectioners, more energetic and better advised than the chemists, immediately availed themselves of them. Artificial aromatic oils appeared for the first time at the exhibition in London, in 1851. There was to be seen a "pear oil," exhaling an agreeable odour of Jargonelle pear, and useful in the aromatization of bonbons, which was only a solution of amyl-acetic ether in alcohol. By its side was "apple oil," having the perfume of the best pippins, obtained by dissolving amyl-valeric ether in alcohol. The most abundant essence was that of "pine apple," which was nothing but ordinary butyric ether. There was also "essence of cognac," or "grape oil," employed for giving brandy of inferior quality the choice aroma of cognac. But the product which was then, as now, the most important article of manufacture, was the "essence of mirbane," the odour of which corresponds entirely with that of essence of bitter almonds, and which in commerce is frequently substituted for that of the latter. The essence of mirbane is identical with nitro-benzol, produced by the reaction of nitric acid upon benzol. Benzol, in its turn, has a common origin with the aniline colors as one of the products of the distillation of tar.

Besides the essences above noticed, of which the manufacture is still growing in importance, there are also prepared artificially essences of quince, strawberry, rum, etc. All these preparations, it may be mentioned, are used in the aromatization of various confectionery, liqueurs, and preserves, the products of industry replacing those of Nature. In every case the synthesis of the odoriferous principles ranks among the most beautiful triumphs of organic chemistry.

Linnæus, whose mind was eminently analytical and methodical, not only ranged animals and vegetables in orders, but also classified diseases, and even odours. He divided the latter into seven classes: aromatic odours, as those of laurel leaves; fragrant odours, as those of the lily and jasmin; ambrosial odours, as those of ambergris and musk; alliaceous odours, as that of garlic; fetid odours, as those of the goat and the stinking goose-fat; repulsive odours, as those of many Solanaclæ; and, finally, nauseus odours. The denominations of Linnæus have generally prevailed in language, but have only a conventional value. There is no standard for the comparison of odours; they can only be arranged according to the degrees of analogy that exist between the impressions they make upon the olfactory nerve. They have no characters that can be rigorously defined, and therefore it is impossible to give them a natural classification.

The sensations produced by odours are appreciated in very variable degrees, although with less diversity than those of tastes.

Montaigne says that he has seen those who feared the scent of apples more than arquebuses. History records that Louis XIV. could not endure perfumes. Gretry was distressed by the scent of roses, and the smell of a hare caused Mdlle. Contat to faint. Odours which to us are repugnant, as those of asafœtida and valerian root, are, on the contrary, the delight of Orientals, who enjoy these substances as condiments. M. Cloquet mentions a young girl who found great pleasure in the smell of old books, and a lawyer upon whom the exhalations of a dunghill produced the most agreeable sensations. There, it is not possible to establish general rules concerning the influence of odours upon our organs, and the quality of sensations which they cause in us. Nevertheless, it is certain that in a physiological point of view there are some which exercise a constant action. Chardin, and other travellers, say that when a pouch containing the musk is removed from the animal, the operator is compelled to cover the mouth and nose with linen bandages, many folds thick, to avoid violent hæmorrhage.

Certain substances which, in a state of considerable diffusion, have an agreeable perfume, exhale, when in a concentrated state, a repugnant and, sometimes, dangerous odour. This is true, especially of patchouli, civet, and the essence of neroli and thyme. The odours of the lily, daffodil, violet, rose, elder, etc., when they attain a certain degree of concentration, exercise, ordinarily, an injurious effect upon the system, by causing more or less violent headache, syncope, or even worse. The annals of science mention several cases of death due to the toxic action of certain odorous emanations. Labiate plants, as sage and rosemary, on the contrary, appear to be endowed rather with salutary properties. It is important, however, to distinguish between the, in some sort, purely dynamic action of the odour, intoxication by the essences, and the effect of carbonic acid given off by the plants. These three causes have been confounded by authors who have recorded cases of death occurring after more or less prolonged inhalation of fragrant air.

This variable action, sometimes salutary, sometimes hurtful, of odours upon the nervous system explains the part they have always played in the history of nations. For there is something instinctive in the universal and continual liking of mankind for perfumes. Without a doubt this is rather a sensual refinement than a natural desire. But the same thing has happened with perfumes as with drinks and music—habit has become second nature; the senses have acquired a taste for this particular intoxication, which charms them, and hides painful realities.

It is in religion that we recognize the earliest employment of perfumes. Nothing noble or sacred could be imagined without the intervention of their influence. Perfumes were held to dispose the gods to listen to the vows addressed to them in the temples where incense burned and spread its balmy vapours. From the highest

antiquity the priests of various religions had recourse to the employment of odoriferous substances. Five times daily the disciples of Zoroaster placed odours before the altar where burned the sacred fire. Moses, in the Book of Exodus, gives the composition of two liturgical perfumes. The Greeks gave to perfumes a high place in their ingenious mythological fictions; they believed that the gods always announced their presence by an ambrosial odour. Thus Virgil, in speaking of Venus,—

> "Avertens rosea cervice refulsit,
> Ambrosiæque comæ divinum vertice odorum
> Spiravere."

The employment of perfumes in religious ceremonies doubtless had for its object to provoke a kind of intoxication in the priests and priestesses, and to mask the smell of the blood and putrid matters resulting from the sacrifices. The Christian religion borrowed from Paganism the use of perfumes in religious ceremonies. There was even a time when the Church of Rome possessed territory in the East devoted exclusively to plantations of trees yielding balsamic resins.

Besides these public uses in ancient times, perfumes were frequently employed in private life. In reading ancient history few things are more astonishing than what appertains to this subject. Amongst the Jews the use of perfumes was confined within proper limits by the prescriptions of the Mosaic law, being reserved for religious worship. But with the Greeks it attained an excessive extension and refinement. They deposited their clothes in scented coffers; they burnt aromatics during their meals; perfumed their wines, and covered the head with perfumes at a banquet. At Athens the perfumers had shops which were used as places of assembly. Appolonius, a discipls of Herophilus, has left a treatise on perfumes, which proves that even in regard to the extraction of essences the Greeks had arrived at a surprising perfection. Neither the prohibitions of Solon nor the anathemas of Socrates could arrest the spread of this passion. The Romans inherited it from the Greeks, and added to the perfumes of the East those of Italy and Gaul. They used them with profusion to scent their baths and chambers, beds and beverages, and scattered them upon the heads of their guests. The awning that covered the amphitheatre was steeped in perfumed water, which fell, as a gentle rain, upon the heads of the pu[illegible]c. Even the Roman eagles were, before a battle, covered with the finest essences. At the funeral of his wife, Poppæa, Nero burnt upon the pyre more incense than Arabia produced in a whole year. It is said, also, that one at least, who had been prescribed by the Triumvirs, was betrayed by the odours that he carried, and was so discovered to the soldiers sent to seek him. Besides the perfumes extracted from mint, majoram, and violet, which were the most common, the

ancients frequently used the rose and various aromatics, such as spikenard, cinnamon, balm of Gilead, etc.

It is curious to notice that the use of perfumes, brought to Rome with the customs of the Greeks, was in its turn introduced with the Latin customs into France and the north of Europe, and chiefly by the Roman religion. In fact it passed from religious ceremonies into political ceremonies, and thence into private life. Among the presents that Haroun-al-Raschid sent to Charlemagne were large quantities of perfumes. In the middle ages, monarchs and great barons washed their hands before and after a repast in rose water; some even indulged in gushing fountains of aromatic waters. At that time, too, it was customary to carry the dead to the place of sepulture with the face uncovered, and place in the coffins burning perfumes. The French monarchy constantly showed an unbridled liking for these luxuries. Marshal Richelieu used perfumes in such excess that he was no longer sensible to them, and habitually lived in an atmosphere so loaded with them as to cause indisposition to people who visited him. Madame Tallien, upon coming out from a bath of strawberries and raspberries, used to cause herself to be gently rubbed with sponges dipped in perfumed milk. Finally, Napoleon every morning poured eau de cologne upon his head and shoulders.

EXTRACT OF MEAT.

BY BARON LIEBIG,

*President of the Royal Academy of Sciences at Munich.**

Some years ago two physiologists at Vienna attempted to prove, by experiments on themselves, respecting the effect and value of common salt in the process of nutrition, that salt is a luxury, and of no value for nutrition and the preservation of health. In matters affecting the alimentation of the people no importance can be attached to such trifling experiments, if they are in contradiction to confirmed experiences, and this contradiction will grow in the same proportion the less the experimentalist is capable of observing and rightly interpreting facts.

In order to comprehend the difference between "common food" and "nervous food," as I will call it, in order to avoid circumscription, it must be considered that man has two kinds of work to perform, muscular or mechanical work, and brain or nervous work. The one, the muscular work, is under the dominion of the nerves and the brain.

*The concluding portion of a paper published in the American Chemist.

By "common food" must be understood those substances which serve for the preservation of the temperature and restoration of the machine. Coffee, tea, and extract of meat are not suited to these purposes; by their effect, however, on the nerves they exercise a decided influence.

The experiments made with extract of meat in Russia, France, and Sweden are what in the scientific world are termed "sham experiments." They are not undertaken to find out that which is not known, but, as the result is known beforehand, appear really only to be made with a view to deceive others, and the conclusions drawn from them are simply absurd. It will suffice to describe one of these experiments in order to convince any one who bears in mind that it has been scientifically determined that extract of meat does not contain any substances necessary for the formation of albumen in the blood, and for the restoration of the waste of muscular tissue.

Two dogs of almost equal weight were fed, the one with meat, the other with extract of meat. The former was fed with 400-500 grm. fresh meat, the other with 12½-15 grm. extract of meat (the quantity contained in 400-500 grm. fresh meat). The dog fed on meat flourished, his weight rather increased, while the other fed on extract of meat only, became thin, was attacked with diarrhœa, and would have died if the experiment had been continued. The inference drawn from this experiment is: Extract of meat is not nutritious, it rather has poisonous effects, causes diarrhœa, and would produce death. That the other dog had likewise consumed 12½-15 grm. extract of meat in the 400-500 grm. of meat without being seized with diarrhœa and feeling any injurious effect—this fact does not trouble the experimentalist; nor does it concern him that a dog weighing from 2 to 3 kilogrammes requires from 40 to 50 grm. of carbon in his food for the process of respiration and to keep up the weight of his body, while 12 to 15 grm. extract of meat only contain 3-4 grm. of carbon.

These experiments made by Dr. Beljawski, in Moscow, and the conclusions drawn from them, are identical with the French: *vide Moniteur Scientifique, Quesneville,* 1-15 Dec., 1871. That no experiments have been made in England similar to those in Russia and France proves that English physiologists possess more common sense.

Concerning the standing of Professor Almen, in Sweden, it will suffice to mention here his assertion that "a glass of warm water with a little pepper must produce the same effect as a cup of beef-tea." What sensible physician would venture to prescribe warm water with pepper instead of meat broth to a patient recovering from typhoid fever? Nor is this done in spite of Professor Almen, in the Swedish hospitals. Beef-tea is used there in the same cases and for the same purpose as with us.

That in Gottingen extract of meat is generally used in family

households and also in that of Professor Mussner, I may venture to affirm.

In order to correctly understand the significance of meat diet and extract of meat, it is necessary to turn one's attention to the difference of the component parts of meat and those of vegetable foods. Meat contains in its albuminates the chief requirements for the renovation of the muscular tissues, and for the preservation of lasting muscular action. Those constituents of the meat which are soluble in boiling water take no part in the formation and renovation of the muscular tissues. But by their effect on the nerves they exercise a most decided influence on muscular work, wherein meat differs from all other animal and vegetable food.

By the use of meat we consequently obtain two effects, the one, effect on the nerves, perfecting and strengthening, the other muscular action. The price of other articles of food, even of those containing a considerable amount of muscle-forming material, is much lower than that of meat, and is not in proportion to the contents of muscle-forming substance. According to calculations made in my own household, we obtain in one 100 lb. of butchers' meat (67 lb. muscle, 12½ lb. bones, 8½ lb. fat, 3 lb. membrane) 13·9 lb. albuminates. In 100 lb. cheese there are from 26 lb. to 30 lb. albuminates, and likewise is the liver and brain richer in albuminates than the same weight of butchers' meat. The blood of animals is richer still in albuminates in proportion to its price. Nevertheless, nobody thinks of placing blood, liver, or cheese fully on a par with butchers' meat.

Vegetable albuminates are still lower in price, and from these is produced in the bodies of animals all the muscular food which man consumes. 100 parts of ordinary wheaten flour contains very nearly as much muscular food as 100 parts of fresh meat, but how small is the price of bread as compared to that of meat

This clearly shows that the instinct of man discovered a difference in the effects of his various foods, and that he does not estimate and judge them in proportion to their contents of carbon and nitrogen, or of muscle-forming and heat-producing substances ; but that he pays a higher price for meat because meat contains certain other substances which are totally wanting in other articles of food, and it is these very substances which form the component parts of beef-tea as well as of extract of meat.

These substances, as is well known, impart to meat its peculiar value for nutrition, and form the difference between vegetable and animal diet. The difference between the two, therefore, is not based on the dissimlar nature and facility of assimilation of the albuminates, contained in the animal and vegetable food, but in the fact that meat contains certain elements which are not to found in cheese, in blood, and in vegetables.

I believe that the researches of Pettenkofer and Voit are calculated to throw some light on the effects of the component parts

of extract of meat. In their experiment on the tissue waste of a man in normal condition while abstaining from food, the individual breathing in the apparatus of respiration was left in three instances without food with the exception of water, salt (15 grm.) and a little extract of meat (12½ grm., rather less than half an ounce), and with respect to the results obtained the two experimentalists says, "The state of health during the privation of food for thirty-six hours was a completely normal one, and according to the assurance of the fasting man, he could have borne it longer." This fact explains, I believe, the physiological importance of the soluble parts of meat or extract of meat; they do not serve for the renovation of the machine but they maintain it by their effects on the nerves during temporary disturbances, even when deprived of food, in normal action, and it cannot be doubted that it is this effect which is paid for by the higher price of meat.

London navvies who were sent out during the Crimean war to construct the railway at Balaclava, and who, according to the report of Dr. Baudin, created by the extraordinary amount of work they performed the greatest atonishment among the English and French soldiers, consumed daily in there food from 150 to 159 grms. albuminates.

The agricultural labourer in Upper Bavaria consumes in his farinaceous food, according to the experience and calculations of Professor Dr. H. Ranke, 153 grammes, therefore almost the same quantity of albuminates as the English navvy, but how extremely different are the working capabilities of the English and Bavarian labourer in reference to the energy of work, *i.e.*, the amount of work accomplished within a given time, and this difference is attained by the English navvy consuming more than one-half of the albuminates in the shape of meat, whilst the Bavarian eats meat only on six days of the year. A few slices of bread and butter with milk at breakfast give nutriment enough for a child; an adult, however, has very different work to perform, and he therefore increases the effect of his food by a cup of tea or coffee. It is stated in Frankfort-on-Maine as a well-known fact that old Mayer Anselm Rothschild, the founder of the eminent firm, never despatched any important business at night without having previously taken a cup of strong black coffee; and it may be supposed that the celebrated financier derived some advantage from the effect of the coffee on his decisions, for he was not the man to spend a farthing for anything which would not have given him a return.

When the meat by boiling has been freed from its soluble parts, the remainder, or more correctly the albuminates in such residue, have no greater nutritive value than the gluten of wheaten flour, which remains after the manufacturing of starch. Both the meat albuminates and the gluten are chemically and in their physiological effect identical things.

If, to meat exhausted in this way, the extracted parts are readded in the shape of beef-tea or extract of meat, it is eagerly eaten by dogs who despise it without such addition ; in fact, all component parts of meat are thereby reunited which are contained in roast meat.

Now, as vegetable albuminates are identical with albuminates contained in the flesh of animals, it will be easily perceived that if we add to our vegetable food, being rich in vegetable albuminates, for instance to bread, peas, beans, or even potatoes and rice, the soluble parts of meat such as are combined in extract of meat, we thereby impart the peculiar nutritive value to it which distinguishes meat in our estimation from other food.

Dr. Gerhard Rohlfs, well-known by his travels in Morocco, says, in reference to the effect of extract of meat, in a letter addressed to me : "As regards extract of meat, it has proved, particnlarly to us travellers in Africa, one of the greatest blessings. On my travels through the great desert from Tripolis to the Tschad Lake, it was my daily food. Being without my meat, I took it in the morning spread upon biscuits, and this was not only very palatable, but it proved a complete substitute for meat diet. In the evening, I made beef-tea, adding a good portion to rice, lentils, or kuskuss, or whatever I happened to possess in the shape of vegetables. I have become so accustomed to the extract of meat that I am still obliged to keep it constantly in my house."

It will be well understood, therefore, that by the addition of extract of meat to our food, we neither economize carbon for the maintenance of the temperature, nor nitrogen for the sustenance of the organs of our body, and that it therefore cannot be called "food in the ordinary sense," but we thereby increase its working capabilities and its capacity to resist exterior injurious disturbances—*i.e.*, to maintain health under unfavourable circumstances. Thus an addition of extract of meat to vegetable food forms the only mean to make up for a want of meat.

All this taken together gives to these substances, to which also belong tea and coffee, a very high value in the alimentation of our populations, the last and true object of which is the production of working power for mental and bodily work ; and it becomes perfectly intelligible why the great historain Macaulay devoted very properly, in his celebrated work, an entire chapter to the introduction of coffee into England as being to some extent connected with modern life.

For our object it is tolerably indifferent with what name is designated the effect of the so-called "nervous stimulants."

A few years since agriculturists still considered gypsum, lime, and bone meal to be stimulants for the growth of plants ; now we know perfectly well that they are nutritive substances for plants. In modern life men on the whole preform more muscular and brain work than formerly, and the average duration of life of individuals has not decreased but increased, and nobody who takes a comprehensive

survey of life can doubt that coffee and tea contribute largely to this end, and that extract of meat properly used is a really good and a most useful thing.

In conclusion, it may be mentioned that I have given my ideas on this subject in two treatises, both of which appeared in English scientific journals; the one "On the Nutritive Value of Different Sorts of Food," in the *Lancet*, January, February and March 1869; the other in the London *Pharmaceutical Journal*, "The Source of Muscular Power," September and October 1870: and I think that no English physician wishing to criticize my opinions should be allowed to ignore these two treatises of mine.

EUCALYPTS OF AUSTRALIA.*

BY CHRISTIAN HOFFMANN,

Of the Geological Survey of Canada, and late Phytologic Chemist to the State Gardens, Melbourne, Australia.

(*Continued from page* 346.)

II.—The Bark of the Eucalypts.*

The bark of some of these trees is remarkable for its hardness, notably so that of the so-called iron-bark tree (*Eucalyptus Leucoxylon*, Fred. Mueller), which is particularly thick and rugged, and studded with deposits of a dark thick gum-resin: others are thick and bulky, of a lax and what might be termed fibrous texture; this especially holds good with regard to that of the so-called stringy-bark tree (*Eucalyptus obliqua*, L'Heritier), which is removed in large sheets and employed for roofing purposes in the interior, affording a cool and effectual shelter from the sun and rain. The aborigines are very dexterous in the art of separating it from the tree and flattening it for the purpose alluded to. Some species throw off their outer bark in longitudinal strips, which hanging down from the stems and branches, present a very singular appearance. Amongst a variety of material upon which I experimented with the view of ascertaining their applicability to paper making, were the barks of a number

*As an appendix to the preceding section, the author has given a number of valuable tables, which, for want of space we are compelled to omit. The tables embrace those giving the percentage of potash obtainable from the leaves, branches, bark, and trunkwood of the various Eucalypts. There are also two tables giving the result of destructive distillation, and determining the amount of charcoal, tar, wood vinegar, and wood spirit to be obtained from these woods.—Ed. Can. Pharm. Jour.

of species of Eucalypts. From my samples of paper it was inferred that the barks of *Eucalyptus obliqua*, L'Her., *Eucalyptus rostrata*, Schl., *Eucalyptus amygdalina*, Lab., *Eucalyptus globulus*, Lab., *Eucalyptus goniocalyx*, F. M., *Eucalyptus corymbosa*, Sm., *Eucalyptus Leucoxylon*, F. M., *Eucalyptus longifolia*, Link., and *Eucalyptus Stuartiana*, F. M., were all well adapted for the manufacture of packing paper, mill and paste boards; that of the *E. globulus* possibly also for printing paper; and that of the *E. obliqua* also for printing and even for writing paper. From this it may be inferred that they are not unlikely to meet with applications in this branch of industry.

The barks of many of the species are remarkable for their astringent qualities, and upon examination were found to contain appreciable quantities of tannin. From my determinations the following have been selected, which may serve to show the probable value of the barks as tanning materials

TABLE.—Showing the percentage of Tannic and Gallic acids in the barks of some species of Eucalypts.

Systematic Name.	Vernacular Name.	Locality.	Tannic Acid.	Gallic Acid.
Eucalyptus Stuartiana.	Mountain Ash.	Gippsland.	4.6	0.7
" longifolia.	Woollybutt.	"	8.3	2.8
" corymbosa.	Bloodwood tree.	"	2.7	0.8

III.—GUM-RESINS OF THE EUCALYPTS.

These are produced in greater or lesser quantities by all the species of this genus; from this circumstance the Eucalypts are almost universally called by the Colonists "Gum trees."

These substances occur within the trunks of trees of all sizes, in flattened cavities in the otherwise solid wood, which often lie parallel to the rings of growth. In such places the deposition of the gum-resin, which is at first a viscid liquid, becomes gradually inspissated, and subsequently hard and brittle. The liquid gum-resin may be obtained by making incisions in the stems of growing trees; they are very viscid treacle-like fluids, not differing in chemical composition from those which have undergone indurations, save that they contain more water; the indurated looses from 15 to 20, and the liquid gum-resin about 65 per cent. at a temberature of 212° F. When thus dried they are exceedingly friable and easily pulverised.

In their general characteristics, these gum-resins resemble each other very closely. In the solid form they present the appearance of small angular masses, not unfrequently intermixed with particles

of wood. The prevailing color is dark red-brown, in some cases dull with olive and yellowish tints, in others bright ruby colored and transparent; black and opaque pieces are also very commonly interspersed through each of the varieties described. In the mouth they are tough, adhere to the teeth, and color the saliva red; their taste is intensely astringent, with a slight bitter flavor; in this respect, however, there is some dissimilarity.

The gum-resin from *Eucalyptus resinifera* is that which is known under the name of Botany Bay Kino; it is for all medicinal purposes considered equal to Kino: that from *Eucalyptus rostrata* is preferred to others as a therapeutic, and as an astringent is particularly administered in Europe and India in cases of chronic diarrhœa. The solvent action of water upon these gum-resins differs according to the species operated on. The aqueous solutions give an acid reaction; in these solutions acetate of lead gives copious gelatinous precipitates; solution of gelatin causes precipitates, which however do not in any case appear to be so abundant as might have been anticipated from the intense astringent taste of these gum-resins. Ferric salts give precipitates of various shades of green and black; mineral a[illegible]s produce bulky flocculent deposits.

These bodies, so far as I am aware, have hitherto been but very cursorily examined; they offer an interesting field for chemical investigation.

IV.—Essential Oils from the Eucalypts.

To Baron Von Mueller is due the credit of having been the first to draw attention to this important subject, important, whether regarded from a scientific point of view, or one of industrial importance, as will be conceded on becoming acquainted with their valuable properties. At his suggestion, Messrs. Bosisto and Johnson entered upon the preparation of the essential oils from a number of species of the genus; in each case determining the yield, etc., etc., the material upon which their experiments were conducted having been supplied by Baron Von Mueller, all uncertainty regarding the true botanical name of the trees from which the samples were obtained has been removed. The supply of material from which these oils are prepared, is almost unlimited: the plants furnishing it constituting the great bulk of the forest vegetation of the country. Speaking of Victoria alone, the area in that colony occupied by forest trees and scrubs has been estimated at 73,000 square miles, of which 71,500 square miles are occupied by Eucalypti of various species; and wherever these trees are felled for timber (this more especially applies to *Eucalyptus globulus*, the timber of which is always in great demand), the foliage which otherwise is wasted, would be available in great abundance for the extraction of the oil.

Mr. Jas. Bosisto, with a praiseworthy spirit of enterprise, entered

upon the preparation of these oils on a large scale, with what success (commercially speaking) I am, however, not prepared to state. The similarity in the general properties of these oils is so great that it may suffice to make some general allusions to them here, referring the reader for fuller information to the short descriptive account of each of the various oils given under their respective headings further on. They are all soluble in all proportions in turpentine, both fat and drying oils, benzine, naphtha, ether, chloroform, and absolute alcohol. Spirits of wine dissolves them pretty freely; and water on being agitated with an excess takes up in most instances about 1 per cent. by weight.

Inasmuch as they all possess medicinal properties, they will no doubt ultimately meet with extensive application in medicine.

As solvents for a great variety of resinous substances, they are all more or less excellent; amongst other resins dissolved by them, is, singular to say, the fossil Kaurie gum (*Dammara Australis*) of New Zealand, a resin, the exportation of which, in large quantities has hitherto been retarded in consequence of the difficulty experienced in bringing it into perfect solution. From this it will be seen that these oils are well adapted for the preparation of varnishes and lackers.

For illuminating purposes they are equally valuable. In all cases they burn with a brilliant flame, almost equal, and in some cases even superior, to that from the best American kerosene, whilst the odor, if any, produced by their combustion, is more agreeable, and, unlike it, they leave no stain upon paper or clothing. Notwithstanding that the quantity of oil obtained from each species was determined with considerable accuracy, the results cannot be regarded as absolutely constant under all circumstances; great variations will be perceptible in the producing powers of oil-bearing trees, due to differences in age (experiments proved that a much larger yield was obtained from the more perfectly matured leaf than from those of younger growth), in the localities where grown, whether in high or low, moist or dry ground, in the time of the year when the leaves were gathered, and in climatic influences generally.

The apparatus. employed by me, when preparing any of the Eucalyptine oils, was the ordinary still, inside of which was placed a strong wire-net basket, about two or three inches less in diameter than the still, and having legs so as to raise it about an inch from the bottom. By this arrangement the material operated upon was prevented from coming into direct contact with the surface of the still. The leaves having been introduced into the basket, water was poured on, the still adjusted as for an ordinary distillation, and direct heat applied. The oil passes over and condenses with the aqueous vapour, and from the watery portion of the distillate is separated by mechanical means. When steam is at command the above method can, it is needless to say, be greatly improved upon.

As previously stated, the *Eucalyptus globulus* is perhaps the species best known outside Australia, from the fact of its having been introduced into Europe, etc., and has therefore been most handy for investigation. It is consequently the oil from this tree which has received most attention, and in alluding to it further on, mention will be made of the experiments of M. Cloëz, who has studied its chemical properties.

GLYCERINE, ITS APPLICATIONS AND COMMERCIAL QUALITY.

A paper bearing a similar title to the above, was read before the Liverpool Chemists' Association, by Mr. Alfred H. Mason, and is published in the *Chemist & Druggist*. The first portion of the paper relates to the modes by which glycerine may be obtained, and also to some of the chemical properties and reactions of this substance. The writer then passes on to consider the numerous purposes to which glycerine has been applied.

As may be imagined, glycerine being a production in which so many wonderful properties are combined, its applications and uses are now manifold, and it appears remarkable that whilst so many sources of impure glycerine have long been known to exist, hundreds of tons being thrown away annually, it is but of late years that it has been utilized, and now the demand for use in pharmacy, arts, etc., is with difficulty supplied.

In the beginning of 1844 Mr. Thomas De La Rue, being engaged in some experiments requiring the use of syrupy substances, procured from the Apothecaries' Hall, London, some glycerine, some of which he applied to a burn and an irritation of the skin. The experience thus obtained of its properties of soothing and keeping moist, led to its introduction into the Hospital for Skin Diseases, where it soon came into extensive use, and from this time it gained considerable favor with the medical profession, being even suggested as a substitute for cod liver oil, or at any rate a vehicle to render that medicine more palatable. But the question of purity arose, most of the samples at that time being found contaminated with lead, even in those samples which were sold as "pure and free from lead;" but since the introduction of Mr. Wilson's process these contaminations need not be, and are rarely met with, so that now glycerine daily becomes more and more made use of in pharmacy and in the surgery.

It must be borne in mind that in applying glycerine externally and internally it should be previously diluted. Glycerine has a strong affinity for moisture, it takes it from the skin and thus gives rise to

a sense of burning. Dilution with water will mitigate this, and in most cases prevent it. In pharmaceutical preparations glycerine may be used as a preservative agent, and to economize the use of alcohol; its more important medicinal value is as a vehicle for the preparation of a great variety of remedies for both internal and external use. The therapeutic effects of some medicines are considerably modified by its use. Solutions in glycerine are practically found in the case of astringents to be much less active than solutions in water. Its usefulness as an application to the surface of the skin when dry and irritable, is testified by the fact that almost every pharmacist now-a-days has his speciality in the shape of glycerine lotion, glycerine cream, etc., and in the demand for the various manufactures of glycerine soaps. Mr. F. A. Sarg of Vienna claims to be the introducer of these things, and he deserves praise for the perfection to which he has brought his glycerine toilet requisites; they really contain glycerine in very fair proportions.

Glycerine is largely used for cosmetics and perfumery, for keeping clay moist for modelling purposes, for preventing mustard from drying up; it is also useful as a lubricating material for some kinds of machinery, more especially watch and chronometer works, because it is not altered by contact with air, does not become thick at a low temperature, and does not attack such metals as copper, brass, etc. It is used in making copying inks. It is an excellent solvent for many substances, including the tar-colours (aniline blue, cyanine, aniline violet) and alizarine. In order to render paper soft and pliable glycerine is added to the pulp; it enters largely into the manufacture of weavers' glue or dressing (which is composed of dextrine 5 parts, glycerine 12 parts, sulphate of alumina 1 part, and water 30 parts), by the use of this mixture the weaving of muslins need not be, as was formerly the case, carried on in damp darkened cellars, but may be performed in well-aired and well-lighted rooms. Santi uses glycerine for the compasses on board screw-steamers, in order to protect the inner compass box against the vibrations caused by the motion of the propeller. A mixture of finely powdered litharge and *anhydrous* glycerine, made into paste, forms a rapidly hardening cement, especially useful as a cover for the corks or bungs of vessels containing such fluids as benzol, essential oils, etc., the cement being impermeable to these liquids. Glycerine, on account of its strong antiseptic powers, has been used successfully as an agent for preserving animal and vegetable substances. For mounting botanical and zoological specimens, as a substitute for alcohol, glycerine has been found preferable, as not being liable to evaporation, not combustible, and preserving the natural colors of the preparations more perfectly. Glycerine is largely used in the process of calico-printing; it is also used under patent process in preparing paper for dry printing; when added to confectioners' wares, preserved fruits, and chocolates, it serves to preserve them from becoming dry—it

serves a similar purpose in the manufacture of tobacco and snuff. The water in gas-meters is liable to freeze in winter, or to evaporate too rapidly in summer—the addition of glycerine prevents these evils. Dr. Pohl and Pasteur have made many experiments with glycerine to apply it for sweetening certain wines which had become sour; and it has been successfully established that glycerine gives the wine a certain mildness and reviving flavor, so that it may be of great service in time of a bad year's growth.

Quality, as it exists in commerce.—Many impurities are necessarily found in crude glycerine, according to the process of manufacture, or the quality of water used in manufacturing. For industrial purposes, these impurities are not objectionable or disadvantageous if only present in moderate proportions; for medicinal use of course it is absolutely necessary that pure glycerine should be used, and the glycerine purified by Wilson's process manufactured by Price's Patent Candle Company is undoubtedly superior to any other I have examined. The fact that continental manufacturers now offer medicinal glycerine *à la* Price, inodorous, etc., would tend to substantiate this statement; and it occurred to me that it might be interesting to know how these various manufactures compare with Price's,—hence the ultimate object of this paper.

I have selected nine samples to report upon, and these represent English and continental manufactures.

The various chemical reagents shown, with the results, in the tabular form below, have been applied in the usual way, standard solutions being added to the specimen of glycerine (the glycerine previously diluted with an equal bulk of water), excepting the argentic nitrate. One part of solution was added to four parts of undiluted glycerine, and mixture allowed to stand twenty-four hours. The specific gravity was taken at 60° F. with Baumé's hydrometer; and several were taken by weight, and found to correspond. The odour is easily ascertained by rubbing a little on the back of the hand: the peculiar mousey smell with some samples is easily detected, and this becomes more intense by heating a little of the glycerine in a test-tube.

Glycerine mixed with an equal volume of rectified sulphuric acid should not produce effervescence or coloration if sufficiently pure for medicinal use.

By adding absolute alcohol and concentrated sulphuric acid, to glycerine, on heating a fruity smell is set free, more or less intense owing to the presence of butyric or formic acid; the peculiar pine-apple odour is very strong in some samples, showing the formation of butyric ether.

For detecting sugar and glucose in glycerine.—To five drops of the glycerine to be tested, add 100 to 120 drops of water, one drop of pure nitric acid, and three or four centigrammes of ammonium molybdate; boil the mixture, and in less than two minutes it will assume an intense bluish-green color if any sugar or glucose is present.

Sample.	Specific Gravity Hydrometer.	Color.	Odor.	Odor when treated.	Sulphuric Acid.	Argentic Nitrate.	Ammonium Oxalate.	Potass Ferrocyanid	Ammon. Hydrosulph.	Barium Chloride.	Litmus.	For Butyric Acid.	For Sugar.
A	31°B.	None.	None.	Very faint	No change.	No change.	No. change.	No cha'ge	No change.	No cha'ge	No cha'ge	Slight smell.	None
B	30°B.	do.	do.	Slight mousey smell.	Slight discolorat'n.	do.	do.	do	do.	do.	do.	Present.	do.
C	30°B.	do.	Slight.	do.	do.	Slight tinge.	Slightly turbid.	do	do.	do.	do.	do.	do.
D	30°B.	do.	do.	do.	No change.	do.	do.	do	do.	do.	do.	do.	do.
E	31°B.	do.	Very faint.	do.	Slight tinge.	Faint opalescence.	No change.	do	do.	do.	do.	do.	do.
F	29°B.	do.	Fatty.	do.	do.	Slightly tinge.	Slightly turbid.	do	do.	do.	do.	do.	do.
G	28°B.	Slightly tinged.	do.	Disagreeable fatty.	do.	More tinged.	do.	do	do.	do.	do.	do.	do.
H	28½°B.	do.	Mousey.	More mousey.	Discoloration.	No change.	No change.	do	do.	do.	do.	do.	do.
I	28°B.	Brown.	Strong & fatty.	Strong & fatty, very offensive.	Intense discoloration and disagreeable odor.	Flocculent deposit.	Great deposit.	do	Discoloration and black deposit.	Deposit.	Red.	Plenty and disagreeable fatty smell.	do.

In the foregoing table, A represents Price's patent glycerine; B, C, D, E, F, were sold by continental manufacturers as double distilled white glycerine. *à la* Price, inodorous, guaranteed to stand the nitrate of silver test (sp. gr. 30° to 31° B); G and H as refined glycerine (28° B sp. gr.); and I a sample of concentrated *crude* glycerine from Hamburg, as exported for manufacturing purposes, A, B, and H have been exposed to strong sunlinght in closed vessels for two days. A was unchanged, but B and H had the mousey odor developed very fully, but without discoloration.

It will be observed that there are *slight* impurities in B, C, D, E, F, but I think none to prevent their being used in pharmacy and medicine when not intended for internal administration.

I consider that pure medicinal glycerine should not be affected by nitrate of silver, sulphuric acid, oxalate of ammonia, or exposure to sunlight, and should be perfectly free from smell after this treatment.

A PROTECTED SOLUTION OF FERROUS NITRATE (LIQUOR FERRI-PROTOXIDI.*

BY ROBERT W. GARDNER.

Take of—

Protosulphate Iron (pure crystals)..... ..	1300 grains.
Water of Ammonia (s. g. ·960)	fl. ℥iij.
Nitric Acid (s. g. 1.393)	fl. ℥j.
Granulated White Sugar.....	q. s.
Oil Sassafras.....	m. iij.
Alcohol	fl. ℥ss.
Water.....	q. s.

Dissolve the sulphate iron and two ounces of sugar in one pint of water; add the water of ammonia, gradually stirring with a glass rod; pour this on a paper filter, and wash with sweetened water (2 oz. sugar to Oj water), until free from sulphate ammonia; let the magma drain until the droppings cease, and transfer filter and precipitate to a large mortar; add 4 oz. Troy sugar, 2 fl. oz. water, and work with the pestle until well mixed.

To the ounce of nitric acid add 3 fl. oz. water, and mix. Add to this gradually (stirring constantly), and toward the last drop by drop, until the green color of the ferrous oxide begins to change to a brown, being very careful that this change *begins only*. Having

* Re-printed from the Proceedings of the American Pharmaceutical Association, 1872.

graduated a bottle to hold two pints, place sugar 28 oz. Troy in it, and filter the liquid through paper upon this, adding water, if necessary, through the filter to bring the measure of the whole to two pints.

Dissolve the oil sassafras in the alcohol, and add to the liquid; finally, fifteen drops nitric acid; shake thoroughly until dissolved, and if not perfectly clear, filter through paper.

The object of the last addition of the nitric acid being to prevent the deposition of iron and to keep it permanently in solution, if after standing the solution becomes cloudy, a few drops more should be added and the whole filtered, no more, however, being used than sufficient for this purpose.

When carefully prepared this solution is nearly white, perfectly clear, shows the reaction of a proto salt with ferridcyanide potassium, and yields a copious precipitate of black ferrous sulphide with sulphide ammonium. The above tests were applied to a sample which had been made six months subject to almost daily use, and consequently exposed to the action of atmospheric air; and in fact, from my experience, I may say that I have kept it without visible change for years. It contains a little over ten grains anhydrous protoxide in an ounce. Ammonia being an imperfect precipitant of the ferrous oxide, the quantity of protosulphate of iron is purposely made a little in excess of forty grains to the ounce, corresponding to 10·359 grains FeO.

I have prepared this solution combined with quassia by adding of a concentrated tincture one drachm to an ounce, distinguishing the two solutions by the respective titles "sweet" and "bitter." Quassia, containing no tannin, seems pecularly adapted to combination with iron salts, and is also a very efficient tonic.

The stable character of this preparation, the wonderful facility with which it is assimilated, the fact that it is readily borne by the most irritable stomach, either child or adult, and that it does not constipate the bowels, renders it a most valuable assimulative preparation of iron.

The dose will vary from one-half to a teaspoonful for adults, five to twenty drops for children. It is found necessary in some instances to begin with very small doses and gradually increase.

It is, of course, incompatible with the alkalies and their carbonates, and should never be diluted except at the moment it is taken.

It has been advantageously combined with sulphate quinia, the sulphate being suspended in it. It should be taken three times a day, after meals.

(Bergen) Jersey City, N. J.

AMMONIACUM.

An inquiry of some interest has been started by Mr. D. Hanbury into the original source of ammoniacum. Dioscorides, in the first century, describes it as coming from "the parts about Cyrene," and near the temple of Ammon, from which it may have derived its name. Some ammoniacum still reaches this country at times from Morocco, and is probably of the same botanical origin as that first described by Dioscorides and others. This gum, however, is very inferior to, and indeed differs from the ordinary Persian ammoniacum, so much so, that certain writers, Pereira, Guibourt, and others, have concluded that the ammoniacum referred to in earlier times was not the same as we know, or that it had been erroneously attributed to Africa. Mr. Hanbury, however, has discovered that a better quality, more nearly corresponding to the usual ammoniacum, is obtained in Morocco, and that it is both consumed in the Empire and finds its way to Egypt and Arabia. This traffic he believes to have been very ancient, and as London brokers now call the Moroccan product "ammoniacum," there does not seem to be any matter for astonishment that the ancient writers should have confused the two gums. In Jackson's account of the Empire of Morocco he describes a sort of ammoniacum produced by a giant fennel called *Feshook*. The gum exudes from the stem in consequence of the puncture of a beetle, and, falling to the ground, becomes contaminated with earth, for which reason it does not suit the London market; but it is used in all parts of the country for cataplasms and fumigations. Following up Mr. Hanbury's inquiries, Mr. John Moss has made a chemical examination of the African ammoniacum, and shows the results in the following table, which, for comparison, he places side by side with an analysis of Persian ammoniacum by Hagen:—

African Ammoniacum. (Moss.)		*Persian Amoniacum.* (Hagen,)	
Resin	67.76	Resin	68.6
Gum	9.014	Gum	19.3
Water and Volatile Oil	4.29	Gluten	5.4
Bassorin and insoluble matter	18.85	Extractive	1.6
		Sand	2.3
		Volatile Oil and Water	2.8
	99.914		100.0

—*Chemist and Druggist.*

BLEACHING SPONGE.*

As several formulæ have been published which have been somewhat deficient in detail for the use of your readers, I send you one more minute in particular that will, on use, be found to bleach sponge to any shade from delicate straw color to a snowy white, the latter requiring only a longer immersion in the liquids or a repetition of the process. The texture of the sponge is not impaired by its use unless the sponge is negligently allowed to remain in the solutions for too long a period.

Having made the sponges free from sand and calcareous matter by gently beating them, wash them in water, squeeze as dry as possible, and then place a few at a time in a solution of *permanganate of potassa*, made by dissolving 180 grains of salt in five pints of water, and pouring a portion of the solution into a suitable glazed vessel. Let them remain a few moments until they have acquired a dark mahogany-brown color, when they are to be squeezed by hand to free them from the solution. They are then dropped, a few at a time, into the bleaching solution made as follows:

Hyposulphite of soda 10 ounces; water, 68 ounces. When dissolved add muriatic acid, 5 ounces.

This solution should be made a day or more before being wanted for use, in order that the sulphur, which is precipitated by the addition of the acid, may be easily separated. This solution is poured off from the sulphur, and, if necessary, strained through a piece of muslin into a glazed vessel. [This portion of the process should be done in the open air or under a hood, where the offensive vapors of of sulphurous acid are removed.] The sponges are allowed to remain in the solution for a few moments, occasionally squeezing them with the hand in order to allow the fluids to thoroughly permeate them, then squeezed out and washed in several waters to rid them of the sulphurous odors. After several washings they may, *if necessary*, be completely deodorized by a *very weak* solution of *bicarbonate of soda* (say 100 grains in five pints of water), and then washed through two or three more waters to free it from traces of alkali. [Much caution should be used in using this alkaline solution, lest it should neutralize the bleaching effect of the previous solutions.] When the sponges are *nearly dry*, immerse them in a solution of glycerine in water, of the strength of a half ounce of glycerine in the pint; squeeze them by hand and let them dry in the air, but not exposed to *direct* sunlight. This will leave them beautifully white and soft to the touch.

*American Druggists Circular.

PHOSPHORESCENT MIXTURES.*

Phosporscent tubes have been sold in France and Germany for several years, but the method of their preparation has not been divulged. Dr. Seelhorst, of Nuremburg, has been experimenting on the subject, and very considerately makes public the best way to secure mixtures that will afford all the colors of the rainbow, and are capable of use in imitation of flowers, insects, and objects of natual history. After the powders are prepared, they can be stirred into melted paraffin; and, by means of a brush, any pattern or design may be put upon glass. By protecting the glass in a frame, the powder will retain the property of glowing for a year or more. The putting of phosphorescent mixtures upon glass in the form of flowers is capable of a very beautiful application, and one that has been very extensively practised. With proper care and study, a landscape could be drawn on glass which, after exposure to the sunlight, would shine in the dark and form a picture of considerable duration. The use of the paraffin is to protect the powders from the action of moisture and prevent decomposition. As a general rule, it is better to hermetically seal the mixtures in flat bottles, when they will retain their good properties for years. The following colors can be obtained very readily :—

Green.—Hyposulphite of strontia, heated for fifteen minutes over a Berzelius lamp and for five minutes over a blast lamp until it is fused, yields a yellowish-green color after exposure to the sunlight. The same color can be obtained by taking equal parts of carbonate of strontia and *lac sulphuris*, heat gently for five minutes, then strongly for 25 minutes over a Bunsen burner, and finally five minutes over a blast. It is granular, and yields a fine green color, darker than the preceding.

Blue.—Sulphate of strontia is prepared by precipitating with sulphuric acid from chloride of strontium. The precipitate is dried, heated in a current of hydrogen gas, then over a Bunsen burner for 10 minutes, and from 15 to to 20 miuntes over a blast lamp. The product sometimes yields a yellow phosphorescent light, and when this is the case, it is necessary to give it another turn over the blast lamp.

Yellow.—Sulphate of baryta 6 parts, charcoal 1 part, fused over a blast lamp, at first afforded no light, but after 24 hours gave an orange yellow light.

It may not be generally known that magnesium light will suffice to bring out all the effect of phosphorescence nearly as well as sunlight.

*Scientific American.

Editorial.

Throughout the entire period during which the Society has been organized, there has not been a circumstance connected with its affairs, which has caused so much annoyance, or regret, as that which is referred to in a communication published on another page. Although we cannot extend a shade of sympathy to those, who, in the face of repeated requests, have wilfully withheld from the payment of their lawful dues, we feel more than sorry that such a disgraceful means of coercion should have been employed.

We should have much preferred to have passed over this matter without remark, but, as it has become the theme of discussion in some of the public prints, we cannot, in justice to the Council and College, remain silent, and allow to go uncontradicted the statements which have been promulgated by the despicable creature who assumes the authority of the college. We would, therefore, deny that a detective was in any way employed by the College, nor are we aware of any individual member of the Council, who, until after the time that Mason's felonious missives had been received, had the slightest knowledge of their being sent. Personally, we had not the most remote idea of the proceeding, until the President —who, until then had been as ignorant as ourself—handed us a letter from a correspondent who enclosed one of Mason's letters which he had received.

The Registrar, in an official communication to the Hamilton *Times*, denies that the Council or College had anything to do with the employment of any detective, and, least of all, of Mason. The question given in our correspondent's letter may then be asked: "From whom did Mason receive his information?" We have been told, that at the request of Mason's lawyer, the Registrar furnished a list of those who were keeping open shop in violation of the Act, and that this was given entirely on the Registrar's own responsibility, without consultation with the Council, or other official advice. It is quite possible that the Registrar could not legally withhold this information, but of this we have no certain knowledge. It was, at all events, a step somewhat rashly taken, but

we have no doubt the patience of the Registrar was somewhat exhausted, as he affirms that every person in arrears had been notified of the fact, at least three times, and yet failed or refused to comply with the law.

We think, with our correspondent, that it would be much better if the Registrar took these prosecutions into his own hands, and that any fines resulting therefrom, were included in the revenue of the College. It would be infinitely more respectable, and we have no doubt that the income arising therefrom would fully cover the expenses incurred in carrying the law into force. We would commend this suggestion to the new Council, so that these duties may be included and understood at the time of the Registrar's appointment.

THE WEIGHTS AND MEASURES ACT, 1873.

At this time it would be almost useless to discuss the expediency of changes in the standards of weight and measurement. The Government has seen fit to make certain alterations, and it only remains for us to fall into the new order of things with as good a grace as possible. We cannot, however, forbear expressing our regret that the imperial standard of measurement should have been selected in preference to the more perfect and simple system which has been already extended to our coinage, and which has been found so generally convenient and acceptable. The decimal system possesses advantages, which, in these labor-saving times, neither legislators nor people can afford to ignore. On the other hand, the imperial system has very little to recommend it over the mode of measurement, according to the wine standard which is, at present, employed in Canada, as well as the United States. The reasons which the promoters of the Weights and Measures Act of 1873 have assigned as justifying the change, are; first, that trade in liquids, between this country and Great Britain, would be facilitated; and, again, that the introduction of the Act would pave the way for the future adoption of the metrical system. In regard to the first of these reasons, it is true that by adopting the system in use in Great Britain, calculations in regard to the bulk of liquids would be no longer necessary, but, at the same time, while our transactions with the mother country would be facilitated, those with the United

States would be hampered, in like degree, and, perhaps, to an equal extent. As to the way being paved towards the introduction of the metrical system, we cannot see that the transition would be rendered appreciably easier. The litre, which is the standard measure of capacity, does not correspond to any denomination of the imperial measures. It is equal to ·2202443 of an imperial gallon, and the increasing and decreasing measures will, of course, be represented by the same figures with different positions of the decimal point. Again, the imperial gallon is equivalent to 4·543358 litres. It is obvious that no simple rule will suffice for the intermutation of these numbers, and, at the same time, afford anything like correct results; and calculations with such unwieldly figures are neccessarily troublesome. We are of opinion, that, instead of serving as a means of introducing the metrical mode, this change will tend to retard its adoption, as frequent alterations of the standard are decidedly inconvenient and deservedly unpopular.

Leaving this aspect of the subject we shall review those points of the new Act which will be interesting to the class of readers we represent, omitting those matters which pertain to the measurement of length, and superficies.

The standard of weight has not been changed, the avoirdupois system being retained; we have, however, a new designation for the hundred weight of 100 pounds, which may, hereafter be described as a "Cental." Troy weight is likewise retained for the estimation of the weight of gold, platina, silver and precious stones. The various weights used must be legibly marked with the denomination which they represent, and it is proposed that the Avoirdupois and Troy weights be constructed of different material, so that they may be more easily distinguished. This matter is, however, left to the discretion of the Governor in Council. As we have before said, the standard of capacity for liquids is the imperial gallon, containing ten pounds of distilled water, measured at 62° F., and with a barometrical pressure of 30 inches; one-fourth of this measure is termed quart; and one-eighth, a pint. There is no further subdivision named, so that for the smaller measures of ounces and drachms we shall have no legal standard.

It is provided that wine measure may be used until sufficient time has expired to provide new vessels, and that in case of a special understanding between vendor and purchaser it may also be em-

ployed. The ratio or proportion which the two standards are to bear to one another is decided to be that twelve wine gallons shall be equal to ten imperial gallons. This proportion is not absolutely correct. Taking the weight of one wine gallon of distilled water, measured at 62° F., and a pressure of 30 inches, to be 8·331111 pounds, that of 12 gallons will be 99·97332 lbs, being ·02668 lbs short of the weight of 10 gals. imperial, measured at a like temperature and pressure. The new system will be applied in the collection of Excise and Customs duties. This is legalized in the 15th section of the Act, wherein it is stated that such duties as are now charged on the wine gallon shall be charged on the imperial gallon in proportion to the greater capacity of that measure, "that is to say, the duties shall be charged and collected in the proportion of six cents on the imperial gallon for five cents now charged and collected on the wine gallon." It will be seen that this ratio is based on the proportionate capacity of the two gallons, as determined by the Act, and is consequently in error.[1] The difference in the amount of Excise duty on spirit, over that at present collected, will be about 3 cents on every hundred gallons of spirit of a strength of 165 degrees on Sykes' scale.

The standard of capacity for dry measure has been altered, and the imperial bushel, containing eight imperial gallons, takes the place of the Winchester measure; one and thirty-one thousands of the latter equal one bushel of the standard measure. A table of the weights of one imperial bushel of various commodities is appended, and may be usefully transcribed. It is to be understood that the weight of these articles rather than the measure is, in commercial transactions, to be regarded :—

Wheat	60 pounds.	Flax Seed	50 pounds.
Indian Corn	56 do.	Hemp Seed	44 do.
Rye	56 do.	Blue Grass Seed	14 do.
Peas	60 do.	Castor Beans	40 do.
Barley	48 do.	Salt	56 do.
Oats	32 do.	Dried Apples	22 do.
Beans	60 do.	Dried Peaches	33 do.
Clover Seed	60 do.	Malt	36 do.
Timothy Seed	48 do.	Potatoes, Turnips, Beets, and such like.	60 do.
Buckwheat	48 do.		

The verification of weights and measurs is provided for by reference to standands, of which three primary sets are to be made. From these, secondary sets, for the use of inspectors, are to be furnished to the department.

The entire control and inspection of weights and measures is placed in charge of the department of Inland Revenue, and the act provides for the creation of necessary offices to ensure effectual working. The inspectors are armed with full power to enter all places where weights or measures are used, and to inspect, condemn, or destroy, as the case may be. Heavy penalties are atttached for using uncertain weights, balances, &c.; for refusing to produce weights, &c.; for counterfeiting the stamp of the inspector, or altering, any balance, weight or measure; for making false weights, and other matters with which we trust our readers will never have experience.

All former acts relating to the subject appear to be repealed, or will be repealed when the new act comes into force. This event will be announced by proclamation as soon as the necessary standards, and other preliminary arrangements, have been prefected.

ELECTION OF COUNCIL.

Members of the College are reminded of the election which takes place on Wednesday, July 2nd. Nominations may be made at any time between the 2nd and 16th of June, but it is indispensible that the Registrar receive the nomination papers on, or before, the latter date, so that sufficient time be allowed to fulfil all the requirements of the law in regard to the details of the manner of election. On the 24th of June, the Registrar will send to each person entitled to vote, a list of those nominated, so that the choice decided upon may be designated, and the voting paper returned before the day of election. On the occasion of the last election, a number of voting papers were sent in, or rather, were not received until after the expiration of the allotted time, and, consequently, the wishes of the senders could not be regarded.

From a copy of the amended by-laws, printed in this number of the journal, it will be seen that some alterations have been made as to those who are eligible for election. The present requirement is, "that the person reside, or carry on business as a druggist, in the Province of Ontario." Persons who are in receipt of any emolument in the gift of the Council may be nominated and elected, but cannot hold a seat in the Council while deriving any pecuniary

benefits from the College. This decision has been interpreted as not applying to the fees received by Examiners, and of course, has no bearing on the ordinary travelling expenses of Councillors.

A clause has been inserted in the by-laws, whereby those who are nominated may decline the nomination, provided notice to such effect is sent to the Registrar within seven days from the date at which the time allowed for nomination expires.

It is to be regretted that the short time at disposal will not allow of any decision being made by the Council in reference to the division of the Province into electoral districts. From what we have been able to learn, the plan suggested in last month's journal appears to meet with general approval, as affording a satisfactory method for the adjustment of an equitable system of representation. It will be well for members to consider the advisability of their adopting this plan in the selection of candidates for election. To this end the classification of counties, made in our last number, may be consulted with advantage; and though, at this late stage, the change in the system of election cannot be officially announced, it is manifestly the wish of the Council that an alteration should be made. As the case stands at present, the thirteen candidates who receive the greatest number of votes will be elected, no matter how they may be distributed throughout the Province, but if, in designating their choice, members would bear in mind the various divisions into which the Province may be advantageously divided, the allotment of Councillors would be much more satisfactorily accomplished.

Editorial Summary.

A New Basis for Suppositories and Pessaries.—(W. Martindale, F.C.S., *Phar. Jour. and Trans.*)—In a paper read before the Pharmaceutical Society of Great Britain, the author comments upon the use of soaps, oil of theobroma, a mixture of glycerine and gelatine, and other substances which have been employed as bases for suppositories. There are disadvantages attending the use of each, and, after various experiments, it was concluded that a mixture of equal parts of Stearic and Oleic Acids, answered a better

purpose, and was generally superior, to any of the vehicles which have, heretofore, been recommended. The peculiar advantages of the mixture are stated to be: 1st.—That the compound has a low fusing point, and thus readily melts at the temperature of the body. This low melting point facilitates the manufacture of the suppository, as the heat of a warm mortar is sufficient for liquefaction, and the compound as quickly cools, so that a suppository may be extemporised in a few minutes. It was found that the heat of the hand would melt the mixture, and that there would be no danger of its remaining in the solid condition in the body. 2nd.—The suppositories leave the mould without any difficulty. The property of contraction on cooling, which is strongly manifested by Stearic Acid, renders this mixture superior to some others. The contraction is equal to about eleven per cent. 3rd.—The basis has the advantage of being a solvent of such alkaloids as pure Morphia and Atropia, and of being itself readily absorbed by the epidermis and mucous membrane, at least as far as the Oleic Acid is concerned. 4th.—On account of the partial crystallization of some of the Stearic Acid, the Suppositories are firm, and can be placed in their position without difficulty, not being elastic, brittle, or yielding in any way. This is a decided advantage over the gelatine composition. 5th.—The proportions of the ingredients can be varied to suit summer or winter temperatures. 6th.—The price of the composition is not above that of Oil of Theobroma, the material which is now most generally employed. The author exhibited specimens of Suppositories which had been medicated with Tannin, Peroxide of Mercury, and Morphia. Similar compositions had been tried at some of the hospitals, and found to work very satisfactorily.

Tinct. Aurantii Recentis.—(C. Symes, Ph. D. in *Phar. Jour. and Trans.*)—A method of preparation yielding a very superior article consists in macerating for 48 hours, 5 ounces of fresh peel of bitter orange, in 3 ounces of distilled water; 17 ounces of rectified spirits are added, and the maceration continued for a week longer. The rationale of the process is this: That the rectified spirit, while it is the best solvent of the essential oil, tends to harden the texture of the peel as to seal from its action the oil in the containing vesicles. Water has the opposite effect, and the previous maceration softens

and breaks up the peel, so that the spirit penetrates it thoroughly. This process, as also a similar one for tincture of lemon peel, is recommended to the consideration of the compilers of the Pharmacopœial Appendix, shortly to be issued.

DETECTION OF WATER IN ESSENTIAL OILS—(G. Leuchs, *Jour. pr. Chem.* in *Jour. Chem. Society.*)—The auther found that all essential oils obtained by distillation with water contained that fluid, even though they appeared quite clear. By mixing such oils with several times their volume of petroleum benzole a turbidity is produced, which may be regarded as characteristic of the presence of water. Water was detected in oils of lavender, cloves, spike, cinnamon, rosemary, sassafras, juniper, lemon, bergamot, and gaultheria. The oils of turpentine, cedar, rue, and amber exhibited no turbidity when treated with benzole.

Correspondence.

To the Editor of Canadian Pharmaceutical Journal.

DEAR SIR,—Two days since I received a letter from that eminent man "Whiskey Detective Mason" informing me that he was instructed by the College of Pharmacy to proceed against me for not being properly registered; it is a fact that a day or two before I received his letter I only had paid my fee for the year, but having been absent from the Province the best part of a year, I forgot all about it, and inasmuch as I have not received a copy of the Journal *for a year* I had nothing to remind me of my neglect of payment.

What I should like to know is: 1st. How did Mason obtain his knowledge. 2nd. Did the Registrar permit him to inspect the books, and if so by what authority he allowed a non-member of the College to meddle with its affairs. 3rd. Would it not be better, as in England, for the Registrar himself to proceed against defaulters and persons not qualified, the fines arising from such proceedings to be paid to College fund. It certainly would look more respectable to the Society than employing men of Mason's stamp.

Yours faithfully,

Brampton, May 5th, 1873. J. D. L. AMBROSSE.

NOTE.—The reason that our correspondent did not receive a copy of the Journal for nearly a year was simply because he was not entitled to it. By a decision of the Council the Journal was ordered to be discontinued to those in arrears.—EDITOR.

BY-LAWS OF THE ONTARIO COLLEGE OF PHARMACY.

I.—The officers of the College shall consist of a President, Vice-President, Registrar, who shall act as Secretary, a Treasurer, and two Auditors.

II.—It shall be the duty of the President, when present, to take the chair at any meeting of the College, or of the Council. He shall regulate the order thereof,—shall decide as to what question is in order, but an appeal may be made from his decisions to the members present, and he shall receive and put motions, which must be in writing, except motions for adjournment. In his absence the Vice-President shall take the chair, and in the absence of both, the members present may appoint one of their number to act in their place.

REGISTRAR'S DUTY.

III.—The Registrar shall be required to furnish his own bond of six hundred dollars, and two securities of three hundred dollars each for the proper disposal of the moneys coming into his hands. It shall be his duty to pay over all moneys in his hands to the Treasurer once a week at least. He shall keep a record of all proceedings, attend to all correspondence, and in all respects act as Secretary, and do all that the Act requires from the Registrar. The remuneration he shall receive shall be four hundred dollars per annum, the first year to date from the first day of March of this year, 1871.

TREASURER'S DUTY.

IV.—It shall be the duty of the Treasurer to take charge of all moneys belonging to the College, and in disbursing them, all orders presented for payment must be signed by the Secretary, and countersigned by the President, or in his absence by the Vice-President. All moneys received by him shall be deposited in a chartered bank, in the name of the Ontario College of Pharmacy, and shall be withdrawn only on order (or cheque) of the Treasurer, countersigned by the President, or in his absence by the Vice-President. He shall be required to give his own bond for two thousand dollars, and bonds of two securities of one thousand dollars each. His compensation shall be one hundred dollars per annum, to date from the 1st of July.

BONDS AND SECURITIES.

V.—The President shall have charge of all bonds and securities given for the proper discharge of official duties. And it shall be the duty of the President and Vice-President to ascertain the safety of the securities.

APPOINTMENT OF AUDITORS.

VI.—The Auditors shall be appointed from members of the Council, who shall examine all accounts connected with the College, and all books belonging to the Registrar and Treasurer, and report on them at the meetings of the Council in February and August of each year.

REGISTRAR AND TREASURER'S ACCOUNT.

VII.—The Registrar and the Treasurer shall be required to present full and detailed accounts, duly audited, at the meetings of the Council in February and August of every year.

MEMBERS AND ASSOCIATES' MONTHLY MEETINGS.

VIII.—The members and associates of the College may hold monthly meetings in the city of Toronto, on the first Friday of the month at 8

o'clock, p.m., for the purpose of discussing scientific matters connected with the objects of the College. Notice of holding such meetings shall be posted at the stores of H. Miller, Lyman Brothers & Co., Elliott & Co., and H. J. Rose, all of Toronto. Notice shall be given also in the JOURNAL. Members may invite friends to the meeting.

NOTIFICATION OF MEETINGS.

IX.—Should the President deem it advisable to call at any time a meeting of the Council, he may do so by giving two weeks' notice of said meeting to the members of said Council. And should any five members of the Council desire a meeting, the President, or in his absence, the Vice-President, shall, on being notified in writing, call such meeting, giving such notice as before stated. At all meetings of the Council five shall constitute a quorum. The objects of the meeting to be given in the notices.

MEETINGS OF THE COLLEGE AND COUNCIL.

X.—All meetings of the College and of the Council shall be held in the city of Toronto, and at such place in the city as the President may appoint.

ELECTION OF COUNCIL.

XI.—The mode of election for the Council shall be as follows:—One month previous to the election every member of the College entitled to vote shall have the power of sending to the Registrar a nomination of not more than thirteen names, who must be members in full standing, such nominations to be received by the Registrar not later than fifteen days previous to the election. The Registrar's duty shall then be to notify the parties nominated requesting them to reply as to whether or not it is their intention to stand for election; should no answer be received from them within seven days the Registrar shall assume they intend to be candidates. The Registrar shall then send the names of the candidates to each member of the College entitled to vote, who shall designate his choice, not exceeding thirteen persons, on a voting paper prepared by the said Registrar; and such paper must be mailed, so as to be received by the Registrar not later than noon on the day of election.

ELECTION OF OFFICERS.

XII.—The mode of election of officers of the Council may be by ballot or open vote, as the Council at each election may decide; provided, however, that if three members request a ballot, it shall be held in that way.

REMUNERATION OF MEMBERS.

XIII.—The remuneration of members of the Council at their semi-annual and other meetings shall be as follows:

RATE OF MILEAGE.

For every mile of travel, coming and returning ..... 4c.
For every day or part of a day while in Session.....$2.00

To be paid by the Treasurer, on certificate of the President or Vice-President and Secretary.

REMUNERATION OF EXAMINERS.

XIV.—The remuneration of examiners shall be, for each of them, 4 cents per mile travelling expenses. $5.00 for each Session. In case the number of candidates exceeds five a further sum of one dollar shall be given to each member of the examining board for each candidate.

ASSOCIATES' FEE.

XV.—The fee which shall be charged to associates or others who may present themselves for examination, shall be four dollars, payable as mentioned in section 13 of Pharmacy Act; but in case of the rejection of the candidate, no fee shall be charged for the next examination.

ORDER OF BUSINESS.

XVI.—At the meetings of the Council the following shall be the order of business:

1.—After the chair has been taken, the minutes of the previous meeting shall be read, and if approved, certified by the chairman.

2.—Business arising out of the minutes to be attended to.

3.—Reports of Committees shall be received and considered.

4.—Auditors' reports shall be received.

5.—Communications shall be read and considered.

6.—New business may be brought forward.

MEETINGS OF THE COUNCIL.

XVII.—All meetings of the Council shall be open to the members and associates of the College, but none but members of the Council may take part in the proceedings.

BY-LAW NOTICES.

XVIII.—Should any member of the Council desire that any by-law be amended or repealed, or desire any new by-law to be added, he must give notice to that effect at a meeting of the Council, and at the next meeting of the Council it shall be the duty of the chairman to bring the matter up for discussion; or any three members of the Council agreeing to desire such amendment, repeal, or addition, they may give notice of the same to the Registrar one month before the next meeting of Council, and it shall then be the duty of the Registrar to notify all the members of the Council of such intention, stating the proposed alteration or addition; such notification to be mailed to each member at least two weeks before the date of assembly of Council.

XIX.—No person shall be eligible to membership in the Council unless he either reside or do carry on business as a druggist in the Province of Ontario, and no person shall be allowed to hold a seat in the Council who is in receipt of any emolument in the gift of the Council whether as salary or from a contract or from any other source excepting the payment of expenses of Councillors and examiners, as provided for by By-laws XIII and XIV.

Practical Formulæ

Chlorodyne.—Chloroform ..... ½ fluid ounce.
Sulphuric ether.....90 minims.
Oil of peppermint..... 8 drops.
Resin of cannabis indica. 8 "
Tincture of capsicum..... 2 "

Mix, shake occasionally, and allow it to stand a few days. Then dissolve with heat.

Muriate of morphia..... 16 grains,
in Water..... 2 drachms,
and when cold, add of,
Scheele's hydrocyanic acid, U.S.P. 65 miniums.
Perchloric acid.. ..... 1 fluid drachm.
Molasses..... 2 fluid ounces.

Add this carefully to the first mixture and increase the whole to four fluid ounces by the addition of molasses.—*Druggists Circular.*

Florida Water.—As in the case of Eau de Colonge, different makers use different formulæ for this. The following is probably the best:—

Oil of lavender... ..... 2 fluid drachms.
Oil of bergamot..... 2 " "
Oil of lemon..... 2 " "
Oil of neroli..... 1 " drachm.
Tincture of turmeric..... 1 " "
Oil of balm..... .....30 drops.
Attar of roses.....10 "
Deodorized alcohol..... 2 pints.

Mix.—*Ibid.*

Ointment for Neuralgia.—Albumen of egg ..... 1 drachm.
Oil of peppermint..... 2 ounces.
Rhigolene..... 4 ounces.
Collodion.....
Chloroform, of each..... 1 ounce

Mix and agitate occasionally during twenty-four hours.

Marine Glue.—This cementing material was patented in 1842, by Mr. Jeffery, of England. It is made by dissolving 1 pound Caoutchouc, cut into small pieces, by means of a wet knife, in gallons of Wood Naphtha. The solution of the gum should aided by frequent stirring, and will usually occupy ten or twelve

days. Two pounds of Shellac are now melted in an iron ladle, and one pound of the solution is stirred in, and the glue is poured out to cool upon slabs. Wood joined by this glue will separate in the substance of the wood itself rather than the joint. Its cementing qualities are unsurpassed, and it possesses the additional advantage of resisting the influence of water.

New Methods for detecting Arsenic in Acids.—Pour on pure tin crystals, stannous chloride 4-6 cc. pure chlorhydric acid of 1.12 sp.g., shake until solution takes place, and add carefully, 2–3 cc. of the sulphuric acid to be examined, gently agitating. In the presence of arsenic the solution assumes a yellowish, then a brownish, and finally a dark grayish-brown, troubled color. 1.500,000 of arsenious acid may be detected. A very delicate test for sulphurons and arsenious acid in hydrochloric acid, given in the German pharmacopœia, is worth mentioning. In a test tube are placed a few small pieces of pure zinc, to which is added hydrochloric acid previously diluted with two parts of water, so that about one-tenth of the tube is filled. In the upper part of the latter is introduced some cotton moistened with solution of subacetate of lead, and the mouth of the tube is covered with some filtering paper dipped in solution of nitrate of silver. In case sulphurous and arsenious acid are present, the cotton as well as the filtering paper becomes blackened after the evolution of hydrogen gas has lasted about half an hour. The test is so delicate that $\frac{1}{3}$ milligramme of arsenious acid (1-480 grain) can be detected in 1,000 grammes (two pounds) of acidum hydrochloric by the silver paper becoming distinctly colored.

Testing Cochineal.—A good process was published by the late Dr. Penny, of Glasgow. It consists in exhausting a gramme of cochineal with fifty grammes of potash solution, and this extract is further diluted with one hundred grammes of water. The solution thus obtained is mixed with graduated solution of ferricyanide of potassium (one gramme of salt to 200 grammes of water) till its color changes to a dark brown. A solution of bleaching powder of known strength can also be used for the same purpose. The best method consists in dyeing equal surfaces of flannel in a bath composed as follows:—

For Scarlet Tints.

Water	1250	grams.
Cream of Tartar	2	"
Tin Composition	2	"
Cochineal	1	"

For Crimson Tints.

Water	1250	grams.
Cream of Tartar	0.75	"
Alum	1.60	"
Cochineal		"

The pieces are then washed and dried, and by a comparison of the relative intensity of shade the value of cochineal is determined.—*Dr. C. Calvertin in Pharm. Jour.*

Hair Dye.—Take of Pyrogallic acid ¼ ounce; hot distilled water 1½ fluid ounce; dissolve, and when the solution has cooled gradually add of alcohol ½ fluid ounce. There are various formulæ containing nitrate of silver, each of which is considered the best by its patrons. Here is one with two liquids :—Best sulphuret of potassium, 3 drachms; distilled water, 2 fluid ounces; liquor of potash, 1½ fluid drachm; agitate together, and after rest decant the clear solution. This is solution No. I. Then for solution No II. take of Crystallized nitrate of silver, 1½ drachm; distilled water, 2 fluid ounces. Mix.—*Am. Drug. Circular.*

Red Branding Ink.—Cinnabar, 7 parts; carbonate of magnesia, 4 parts; turpentine, 1 part; linseed oil, 6 parts; rub down thoroughly till well mixed.—*Am. Drug. Circular.*

Varieties.

On the Presence of Amylic Alcohol in Chloroform.—In the *Union Pharmaceutique* attention is drawn, by M. Hardy, to the presence of amylic alcohol in chloroform. By the process usually employed to rectify chloroform, namely, that of fractional distillation, the amylic alcohol is found to accumulate in the less volatile proportions, and when large quantities are distilled the evidence of its presence becomes very decided in respect to smell. The author is inclined to attribute the presence of this alcohol in chloroform to the contaminated ethylic alcohol used, but he hints at the possibility that it is a secondary product in the reaction by which chloroform is produced. Comparative experiments were made with rectified and unrectified cloroform, by evaporating a quantity of each on bibulous paper. Neither specimen left any stain, but the second left a persistent odor of amylic alcohol, which was not to be detected in the case of the first. Mr. Hardy attributes the nauseous odor which remains on the compresses which have been employed in the medicinal application of cloroform, to the presence of small quantities of amylic alcohol above referred to.—*Phila. Med. & Sury. Rep.*

DRUGS, MEDICINES, &c.	$ c.	$ c.
Acid, Acetic, fort	0 14 @	0 15
Benzoic, pure	0 25	0 35
Citric	1 60	1 70
Muriatic	0 05	0 06
Nitric	0 11½	0 15
Oxalic	0 32	0 35
Sulphuric	0 03¾	0 07
Tartaric, pulv	0 50	0 50
Ammon, carb. casks	0 23	0 24
" jars	0 23	0 24
Liquor, 880	0 25	0 28
Muriate	0 12½	0 15
Nitrate	0 45	0 60
Æther, Acetic	0 45	0 50
Nitrous	0 35	0 37
Sulphuric	0 50	0 50
Antim. Crude, pulv	0 13	0 17
Tart "	0 65	0 70
Alcohol, 95 per ct.....Cash	1 60	1 72
Arrowroot, Jamaica	0 16	0 22
Bermuda	0 50	0 65
Alum	0 02¾	0 03½
Balsam, Canada	0 45	0 50
Copaiba	0 80	0 85
Peru	3 80	4 00
Tolu	0 90	1 00
Bark, Bayberry, pulv	0 20	0 22
Canella	0 17	0 20
Peruvian, yel. pulv	0 42	0 50
" red "	2 10	2 20
Slippery Elm, g. b	0 15	0 20
" flour, packets	0 28	0 32
Sassafras	0 15	0 20
Berries, Cubebs, ground	0 20	0 25
Juniper	0 06	0 10
Beans, Tonquin	0 62	1 10
Vanilla	21 00	28 00
Bismuth, Alb	3 60	4 00
Carb	3 65	4 00
Camphor, Crude	0 38	0 40
Refined	0 45	0 50
Cantharides	2 80	3 00
Powdered	2 85	3 10
Charcoal, Animal	0 04	0 06
Wood, powdered	0 10	0 15
Chiretta	0 20	0 30
Chloroform	1 25	1 65
Cochineal, S. G	0 80	0 95
Black	1 10	1 20
Colocynth, pulv	0 50	0 60
Clolodion	0 95	1 00
Elaterium.....oz	5 80	5 90
Ergot	0 50	0 60
Extract Belladonna	2 00	2 25
Colocynth, Co	1 25	1 75
Gentian	0 50	0 60
Hemlock, Ang	0 85	0 95
Henbane, "	2 10	2 40
Jalap	5 00	5 50
Mandrake	1 75	2 00
Nux Vomic.....oz	0 40	0 50
Opium.....oz	1 50	
Rhubarb	5 00	5 50
Sarsap. Hon. Co	1 00	1 20
" Jam. Co	4 00	4 50
Taraxicum, Ang	0 70	0 80
Flowers, Arnica	0 25	0 35
Chamomile	0 32	0 40
Gum, Aloes, Barb. extra	0 70	0 80
" " good	0 40	0 50
" Cape	0 16	0 20
" " powdered	0 20	0 30
Socot	1 05	1 35
" " pulv	1 00	0 00
Arabic, White	0 70	0 75
" powdered	0 60	2 75
" sorts	0 28	0 30
" " powdered	0 42	0 50
" com. Gedda	0 13	0 16
Assafœtida	0 35	0 42
British or Dextrine	0 13	0 15
Benzoin	0 35	0 75
Catechu	0 12	0 15
" powdered	0 25	0 30
Euphorb, pulv	0 35	0 40
Gamboge	1 40	1 50
Guaiacum	0 35	1 00
Myrrh	0 50	0 70

DRUGS, MEDICINES, &c.—*Contd.*	$ c.	$ c.
Sang Dracon	0 60	0 70
Scammony, powdered	6 50	6 75
" Virg. "	14 50	—
Shellac, Orange	0 55	0 60
Gum, Shellac, liver	0 45	0 50
Storax	0 40	0 45
Tragacanth, flake	1 10	1 40
" common	0 53	0 65
Galls	0 28	0 32
Gelatine, Cox's 6d	1 15	1 20
Glycerine, common	0 30	0 35
Vienna	0 32	0 40
Prices	0 60	0 75
Honey, Canada, best	0 15	0 17
Lower Canada	0 14	0 16
Iron, Carb. Precip	0 20	0 25
" Sacchar	0 40	0 55
Citrate Ammon	1 50	1 50
" & Quinine, oz	0 55	0 60
" & Strychine "	0 17	0 25
Sulphate, pure	0 08	0 10
Iodine, good	8 75	9 00
Resublimed	9 50	—
Jalapin	1 25	1 50
Kreosote	2 40	2 50
Leaves, Buchu	0 22	0 30
Foxglove	0 25	0 30
Henbane	0 35	0 40
Senna, Alex	0 27	0 60
" E. I.	0 14	0 20
" Tinnevilly	0 20	0 30
Uva Ursi	0 15	0 17
Lime, Carbolate.....brl	5 50	—
Chloride	0 06	0 07
Sulphate	0 08	0 12½
Lead, Acetate	0 14	0 15
Leptandrin.....oz.	0 60	—
Liq. Bismuth	0 50	0 75
Lye, Concentrated	1 75	2 00
Liquorice, Solazzi	0 50	0 55
Cassano	0 23	0 40
Other brands	0 14	0 25
Liquorice, Refined	0 35	0 45
Magnesia, Carb..... 1 oz.	0 20	0 25
" ..... 4 oz.	0 17	0 20
Calcined	0 65	0 75
Citrate.....gran.	0 50	0 55
Mercury	1 30	1 35
Bichlor	1 15	1 20
Chloride	1 35	—
C. Chalk	0 65	—
Nit. Oxyd	1 50	—
Morphia Acet	4 45	4 60
Mur.	4 45	4 60
Sulph	4 60	4 75
Musk, pure grain.....oz	23 00	—
Canton	0 90	1 20
Oil, Amonds, sweet	0 42	0 50
" bitter	14 00	15 00
Aniseed	4 00	4 25
Bergamot, super	6 25	6 50
Carraway	4 00	4 20
Cassia	2 80	2 90
Castor, E. I	0 15	0 15
Crystal	0 22	0 25
Italian	0 26	0 28
Citronella	1 35	1 50
Cloves, Ang	1 75	2 00
Cod Liver	1 25	1 50
Croton	1 75	2 00
Juniper Wood	0 80	1 00
Berries	6 00	7 00
Lavand, Ang.....oz.	0 90	1 00
Exotic	1 40	1 60
Lemon, super	5 00	5 50
ord	3 20	3 40
Orange	4 00	4 25
Origanum	0 65	0 75
Peppermint Ang	13 00	14 40
" Amer	3 50	3 75
Rose, Virgin	8 50	8 75
" good	6 80	7 00
Sassafras	1 00	1 20
Wintergreen	6 00	6 50
Wormwood, pure	4 00	6 50
Ointment, blue	0 90	1 00
Opium, Turkey	7 50	7 75
pulv	10 25	10 50

DRUGS, MEDICINES, &c.—*Cont'd*	$ c.	$ c
Orange Peel, opt.	0 30	0 36
" good	0 12½	0 20
Pill, Blue, Mass.	1 00	1 00
Potash, Bi.chrom	0 23	0 27
Bi-tart	0 33	0 35
Carbonate	0 14	0 20
Chlorate	0 65	0 70
Nitrate	10 50	11 00
Potassium, Bromide	11 5	1 40
Cyanide	0 75	0 80
Iodide	8 50	9 00
Sulphuret	0 25	0 35
Pepsin, Boudault's oz	1 50	—
Houghton's doz.	8 00	9 00
Morson's oz.	0 85	1 10
Phosphorus	0 95	1 00
Podophyllin	0 50	0 60
Quinine, Pelletier's	—	2 45
Howard's	2 45	—
" 100 oz. case.	2 40	—
" 25 oz. tin.	2 40	—
Root, Colombo	0 13	0 20
Curcuma, grd	0 12½	0 17
Dandelion	0 17	0 20
Elecampane	0 16	0 17
Gentian	0 10	0 12½
" pulv	0 15	0 20
Hellebore, pulv.	0 17	0 20
Ipecac, "	1 70	1 80
Jalap, Vera Cruz	1 00	1 25
" Tampico	0 70	1 00
Liquorice, select	0 12	0 13
" powdered	0 15	0 20
Mandrake "	0 20	0 25
Orris, "	0 20	0 25
Rhubarb, Turkey	2 50	2 75
" E. I.	1 10	1 20
" " pulv	1 20	1 30
" " 2nd	0 90	1 00
" French	0 75	—
Sarsap., Hond	0 40	0 45
" Jam	0 88	0 90
Squills	0 10	0 15½
Senega	1 35	1 50
Spigelia	0 40	0 45
Sal., Epsom	2 25	3 00
Rochelle	0 32	0 35
Soda	0 02½	0 03
Seed, Anise	0 13	0 16
Canary	0 05	0 06
Cardamon	2 85	2 95
Fenugreek, g'd	0 09	0 10
Hemp	0 06½	—
Mustard, white	0 14	0 16
Saffron, American	1 15	1 50
Spanish	15 00	17 00
Santonine	8 25	9 00
Sago	0 08	0 09
Silver, Nitrate Cash	14 85	16 50
Soap Castile, mottled	0 11	0 14
Soda Ash	0 04	0 05
Bicarb. Newcastle	—	6 50
" Howard's	0 14	0 16
Caustic	0 06½	0 06½
Spirits Ammon., arom	0 35	0 35
Strychnine, Crystals	2 60	2 70
Sulphur, Precip	0 10	0 12½
Sublimed	0 03½	0 05
Roll	0 03	0 04½
Vinegar, Wine, pure	0 55	0 60
Verdigris	0 35	0 40
Wax, White, pure	0 75	0 80
Zinc. Chloride oz	0 10	0 15
Sulphate, pure	0 10	0 15
" common	0 06	0 10
DYESTUFFS.		
Annatto	0 35 @	0 60
Analine, Magenta, cryst	3 00	4 00
liquid	2 00	—
Argols, ground	0 15	0 25
Blue Vitrol, pure	0 10	0 10
Camwood	0 06	0 09
Copperas, Green	0 01½	0 02½
Cudbear	0 16	0 25
Fustic, Cuban	0 02½	0 04
Indigo, Bengal	2 40	2 50
Madras	0 95	1 10
Extract	0 30	0 35

DYESTUFFS—*Continued.*		
Japonica	0 06½	0 06½
Lacdye, powdered	0 33	0 38
Logwood	0 02	0 03
Logwood, Camp	0 02	0 3½
Extract	0 10	0 14
" 1 lb. bxs.	0 14	—
" ½ lb. "	0 15	—
Madder, best Dutch	0 16	0 17
2nd quality	0 14	0 16
Quercitron	0 03	0 05
Sumac	0 06	0 08
Tin, Muriate	0 10½	0 12½
Redwood	0 05	0 06
SPICES.		
Allspice	0 11½@	0 12
Cassia	0 39	0 40
Cloves	0 21	0 22
Cayenne	0 30	0 35
Ginger, E. I.	0 16	0 17
Jam	0 20	0 30
Mace	1 75	1 75
Mustard, com	0 20	0 25
Nutmegs	1 15	1 20
Pepper, Black	0 22½	0 23
White	0 48	0 50
PAINTS, DRY.		
Black, Lamp, com	0 07 @	0 08
" refined	0 25	0 30
Blue, Celestial	0 08	0 12
Prussian	0 65	0 75
Brown, Vandyke	0 10	0 12½
Chalk, White	0 01	0 01½
Green, Brunswick	0 07	0 10
Chrome	0 16	0 25
Paris	0 30	0 35
Magnesia	0 20	0 25
Litharge	0 07	0 09
Pink, Rose	0 12½	0 15
Red Lead	0 07	0 08
Venetian	0 02½	0 03½
Sienna, B. & G.	0 10	0 15
Umber	0 07	0 10
Vermillion, English	1 30	1 35
American	0 25	0 35
Whiting	0 85	0 90
White Lead, dry, gen.	0 08	0 09
" " No. 1	0 07	0 08
" " No. 2	0 05	0 07
Yellow Chrome	0 12½	0 35
" Ochre	0 02½	0 03½
Zinc White, Star	0 10	0 12
COLORS, IN OIL.		
Blue Paint	0 12 @	0 15
Fire Proof Paint	0 06	0 08
Green, Paris	0 30	0 37½
Red, Venetian	0 07	0 10
Patent Dryers, 1 lb tins	0 11	0 12
Putty	0 03¾	0 04½
Yellow Ochre	0 08	0 12
White Lead, gen. 25 lb. tins	2 50	—
" No. 1	2 25	—
" No. 2	2 00	—
" No. 3	1 75	—
" com	1 30	—
White Zinc, Snow	2 75	3 25
NAVAL STORES.		
Black Pitch	5 00 @	5 25
Rosin, Strained	5 50	—
Clear, pale	7 80	—
Spirits Turpentine	0 65	0 70
Tar Wood	5 00	5 25
OILS.		
Cod	0 63 @	0 65
Lard, extra	0 90	—
No. 1	0 80	0 85
No. 2	0 75	0 90
Linseed, Raw	0 76	0 80
Boiled	0 81	0 85
Olive, Common	1 10	1 20
Salad	1 80	2 30
" Pints, cases	4 20	4 40
" Quarts	3 25	3 50
Seal Oil, Pale	0 75	0 80
Straw	0 70	0 75
Sesame Salad	1 30	1 35
Sperm, genuine	2 20	2 40
Whale refined	0 90	0 95