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Original Papers.

NOTE ON THE PREPARATION OF SULPHATE OF MANGANESE.

BY HENRY CROFT,
PROFESSOR OF CHEMISTRY, UNIVERSITY, TORONTO.

The new process by F. Mahla for preparing pure manganous sulphate, does not seem to be preferable to the old methods, either as regards economy, practicability, or efficiency. In preparing considerable quantities, the washing out of some pounds of the bulky manganous carbonate would be a tedious operation, and the salt would oxidize.

The same result may be obtained by the old plan, viz.:—heating black oxide (or the residue from the preparation of oxygen), with either sulphuric acid or ferrous sulphate, washing out, which is effected very easily, owing to the density of the residue; precipitating a small portion of the solution with sodium bicarbonate, and boiling this edulcorated precipitate with the remaining solution. We have here only a small quantity of carbonate to edulcorate, and the resulting salt is perfectly pure, if sufficient has been used.

A very small quantity of impurity interferes with the colours of manganous sulphide and other compounds. For lecture experiments, a solution fit for showing those colours can be prepared in a few minutes by partially precipitating the commercial salt with sodium carbonate, boiling and filtering; or by boiling with sodium acetate, and filtering from the ferric oxide.

For greater security, it may be advisable to first peroxidise the solution, by nitric acid or chlorine, &c., &c., but the commercial salt seldom contains iron protoxide.

SYRUPUS FERRI IODIDI.

BY W. B. RUSTON.

Read before the Canadian Pharmaceutical Society, at the Regular Monthly Meeting, May 5th, 1869.

Some three months ago, an article published in the Society's JOURNAL, upon a process for preserving Syr. Ferri Iodidi, led me to make a series of experiments, on account of having myself experienced some little difficulty in making a syrup that would remain, for any lengthened period, without undergoing a change of color.

A brief recital of these may prove of interest to some of the members of the Society who have had trouble in the same quarter. Taking first the formula, as recommended by M. Jeannel, I made a syrup having a pretty good color, although not as bright as it should be: owing, partly, to inability to obtain new honey that was perfectly clear. The syrup has retained its color until the present time; but instead of remaining unchanged in composition, I find that a copious white deposit has formed, and the syrup gives a very decided reaction—much more so than when first made—the tartaric acid giving it a slight acid taste at first. I next added tartaric acid to some syrup of iodide recently made, and also to some syrup which had become discolored, having been made some eight months previous—both syrups being made after the British Pharmacopœia. In each case there was deposited a quantity of garnet colored crystals. These were examined, and found to be tartrate of iron. Upon exposing this syrup to the direct rays of the sun, the tartrate was re-dissolved, and a white, flocculent deposit formed: the syrup exhibited a strong acid reaction, as in the first experiment. Since then I have kept it in a warm place, and it has, for now two months, remained clear; if changed at all, it has become nearer colorless than when first made. Being fully occupied with the duties of business, I have been unable to find time to prove, by analysis, what this similarity of change is,—alike in all the different cases in which the tartaric acid was used,—giving the white precipitate and strong acid reaction in each case; but from experiment, I am convinced that it is produced by the addition of the tartaric acid. I should therefore regard this addition as unjustifiable, as also other suggested additions, such as citric or phosphoric acids.

Further experiments have proved to me that the syrup can be kept without undergoing any change, if attention is given to a few particulars. To arrive at this conclusion, I made a gallon of syrup after the British Pharmacopœia; divided it between three bottles, glass stopped, as cork appears to produce discoloration, on account, probably, of the tannic acid it contains. One bottle was placed in a dark, cool cellar; another stood in a moderately warm place, in the dark; and the third in a warm situation, exposed to the light. The two latter have remained without change for the last three months, while the former has gradually become quite dark in color. It would therefore appear that it is necessary to keep the syrup in a warm situation; and after carefully observing, as well as testing it, for any change, I have concluded that keeping it excluded from, or exposed to light, produces no effect upon the syrup.

As a considerable portion of the iodine appeared to be volatilized by the heat applied in accordance with the directions of the British Pharmacopœia, I last took (as suggested by Mr. A. E. Tanner of the Pharmaceutical Society, England,) the same quantity of iron wire and iodine, and added but two ounces, instead of three, of water, as ordered in the formula of the Pharmacopœia, having the wire so fine as to allow the water to cover the whole when in the flask. The reaction commenced, and progressed without any application of heat, thus avoiding any loss in iodine through volatilization, as well as having the advantage of leaving a larger quantity of the water to dissolve the sugar. The result of this has been most satisfactory, producing a fine bright syrup, which has remained without the least change. I would therefore beg to recommend the last process; and by guarding against the use of corks, and keeping the syrup in a warm, rather than a cool position, I feel satisfied it will retain its color indefinitely.

On the Technical Applications of Dialysis.

BY PROF. CHARLES A. JOY.

A few years ago, Prof. Graham, Director of the Royal Mint in London, discovered that a certain class of substances could be more readily diffused through water than others; he found, for example that salt, sugar, gum, and dried albumen, if placed in different vessels, and covered with water, will all of them be diffused through the water, but not in the same period of time. The salt spreads rapidly; the sugar requires twice the time, the gum four times, and the albumen twenty times longer. He found, as a rule, that substances which crystallize are diffused more rapidly than those which are amorphous. The first class are called crystalloid, and the second class colloid. When they are both in solution we can employ a thin membrane, or a piece of parchment paper, and, as it were, filter or strain the crystalloid through its pores, while the colloid remains behind. This operation is called dialysis, and the contrivance for effecting it, is known as the dialyser.

A sieve, a half barrel, a drum, a glass jar open at both ends, or even porous earthen cells, will serve for the apparatus. By tying a piece of bladder, or of parchment paper, over one end of any of the above pieces of apparatus, and floating it upon water, we have all that is required. If we pour into such a contrivance a solution of albumen and of common salt, and partially sink it into a larger vessel filled with fresh water, the common salt will very rapidly strain through the membrane into the outer water, and leave all of the albumen behind. Even silicic acid, which crystallizes in the form of quartz, can be separated from compounds in this way, provided it has been previously fused with soda. Graham has performed a series of experiments upon a large class of bodies, a recapitulation of which may suggest some practical applications of his simple device.

He discovered that tannic acid diffused through parchment paper two hundred times more slowly than common salt, and finds in this fact an explanation of the reason why it takes tannin so long to penetrate hides so as to convert them into leather. All processes for making leather rapidly will be found to be based upon the facility with which the substances employed pass through membranes, and the agents used are generally composed of crystalline salts. We are not aware of any practical application of Prof. Graham's discovery to the tanning of leather, but it is certainly worthy of the attention of persons engaged in the business.

Gum-arabic diffuses four hundred times more slowly than salt, and hence belongs to the class called colloid.

The method of dialysis can be employed for the detection of arsenic, emetic, corrosive sublimate, or any crystalline poison in the stomach, blood, milk, or any organic compounds. The poisons will pass through the membrane into the outer vessel, and their presence can be shown by the usual tests. The same process can be made available in the case of organic poisons, such as strychnine and morphine, and it is further valuable as a method of original research in seeking for alkaloids in any new plants, and it has even been proposed as the best way for the preparation of alkaloids on a large scale. Many plants contains niter and other mineral salts, which can be separated and detected by dialysis better than in any other way.

Nitrate of sliver, from photographers' waste, when put into the dialyser, passes through to an outer vessel, where it can be precipitated and saved; the albumen and other organic matter will remain in the inner vessel. For this purpose a half barrel, with parchment tied over the bottom, and immersed in a barrel of water, would be a good contrivance.

Great expectations were raised in reference to the separation of sugar from molasses, and its purification by dialysis. Several patents have been taken out for this purpose. At the Paris Exhibition of 1867, Messrs. Carmichel & Co., sugar refiners and distillers, exhibited dialysers for refining sugar, which they called *osmogenes*. Each apparatus contained fifty or sixty frames, forming partitions one quarter of an inch in thickness, and furnished with nettings of strings to support the sheets of parchment paper destined to accomplish the work. The frames with water alternate with those for molasses or sirups. Each frame is provided with an interior opening for the hot water, and another for the syrup, so arranged that each section receives, the one the water, the other the syrup. Both liquids start from a height of three feet, and, after descending to the bottom of the apparatus, return again, at a temperature of 160° to 170° Fahrenheit, and pass out at the top. The water is introduced and regulated according to the extent of purification required.

The inventors of this apparatus claimed for it very important results, and as it was founded upon thorough scientific principles, we see no reason to doubt the truth of their statements. The process is particularly valuable in the manufacture of beet sugar, and for removing potash and lime salts from syrups, but it does not appear to have been generally adopted, probably because it was not well understood.

Mr. Whitelaw took out a patent in England, in 1854, for the removal of salt and niter from salt and corned meats by means of dialysis. It is well known that the brine contains a large proportion of the nutritious constituents of the meat, and if we could remove the salt and evaporate the residue we should have all of the properties of a good soup. It so happens that the savory and valuable constituents of meat are colloids, and will not, therefore, pass through a membrane. The salt, which is added to keep the meat from decay, is crystalline, and, as we have before seen, passes very readily through parchment. Mr. Whitelaw takes advantage of these two facts, and puts the brine into porous jars or bladders, which he suspends in water, that must be renewed three or four times in twenty-four hours. After a few days, the contents of the jars will be found to be fresh and sweet, ready for use as soup, or they can be evaporated down to dryness and converted into meat biscuit. In this country, where such large quantities of corned and salted meats are consumed, the saving of the brine is a matter of much practical importance, particularly as what is thrown away is too often the most nourishing portion of the food.

FILTERING OXYGEN FROM THE AIR.

The same principle of dialysis was successfully applied by Prof. Graham to the concentration of the oxygen in the air. By passing air through the shavings of india-rubber, the rubber retains a portion of the nitrogen, and the quantity of oxygen is increased to forty-one per cent., being twenty per cent more than its usual capacity. An atmosphere with forty-one per cent of oxygen will re-ignite a glowing taper, and, in general, support combustion and respiration in a very active manner. The experiment points out such a simple and cheap way of procuring oxygen from the atmosphere, that it ought to be put to a thorough trial before more money is expended in complicated and costly methods. If, by filtering the air through a membrane, or shavings, or any cheap substances, we can get rid of the nitrogen, we have made a discovery of the highest importance, and the experiments of Graham certainly seem to point out the feasibility of the plan.

Certain physiological phenomena can be very well explained by the doctrine of dialysis; for example, according to Professor Daubeney, of Oxford, gums, starch, oil, or any similar class of bodies secreted in the cells of plants, must be classed among the colloids; they have no tendency to pass through the walls of the cells where they have been elaborated, and consequently arrange themselves into groups. On other hand, the acids and alkalies are crystalloids, and pass freely through the pores of the cells, and are frequently found on the outside, or they pass to the organs of the plant, where they undergo transformation by action of the vital force. The mucous membrane of the stomach may be compared to the parchment of the dialyser—the crystalloid elements are absorbed, while the colloid remain to be subjected to the action of the gastric juice, which, elaborates according to the laws of nutrition.

The action of different kinds of medicines can be explained according to the same law. Those which are crystalloids will diffuse rapidly through the coating of the stomach, while the amorphous medicines will remain, subject to the action of the gastric juice and the laws of digestion.

The application of dialysis in the dry way has been proposed by a French savant. He assumed that substances which fused at different temperatures could be separated by passing them through a porous vessel on the same principle. Such an application would be most valuable in metallurgy, but thus far it has not been reduced to practice. In the manufacture of paper from sea-weed, after the weeds have been boiled in caustic soda, the black liquor is thrown away. It would be well to put the waste liquor into porous cells, suspended in tanks of fresh water, to see if the crystallizable salts of iodine would not pass into the outer vessel, where they could be reclaimed.

We have thus hastily noticed some of the leading applications of dialysis. It is a process so very easy, so simple, and so cheap, that it only needs to be better understood to acquire great popularity.—*Journal of Applied Chemistry.*

On White Gutta Percha.

BY HARRY NAPIER DRAPER, F.C.S.

A paper on "Pure White Gutta-Percha" was contributed to the Norwich Meeting of the Pharmaceutical Confe ce, by Mr. J. Baden Benger. There were some things so remarkable about this paper, that as I was at the time experimenting on gutta-percha, it attracted my attention. I have not, however, until now, had sufficient leisure to make the points which struck me, the subject of a connected note.

Mr. Benger, after justly observing that much of the substance formed in commerce, under the name of "white gutta-percha," is adulterated with oxide of zinc, proposes a process for the manufacture of a really pure product. This consists in dissolving the crude gutta-percha in chloroform, precipitating the filtered solution with spirit of wine, and pressing, drying, and boiling the precipitate in water.

Mr. Benger appears to have been successful; but when it is noted that, according to the data he gives, the production of three ounces of pure gutta-percha requires from five to six pounds of methylated chloroform, and about three pints of spirit of wine, the process does not appear to be very economical, nor is a practical man much reassured on this point by learning that the chloroform and spirit can be recovered; the former by the addition of water and the latter by distilation "at the leisure of the operator."

This process has not even the merit of originality, as it was patented by Dr. Cattell in 1859.

Dr. Cattell at the same time patented other methods of effecting this object. These depended upon the circumstance that when alcohol or pyroxilic spirit is added in small proportion (the specification says one ounce to each gallon), to a solution of gutta-percha in chloroform or sulphide of carbon, the subsidence of the coloring matter is facilitated. But both Dr. Cattell and Mr. Benger seem to have overlooked the fact that the coloring matter of gutta-percha is quite insoluble in benzol, chloroform, and sulphide of carbon, and that the alcohol of the specification acts (if at all), only by diminishing the specific gravity of the solvent, in the cases of the two last named fluids. We set out then with the proposition that all solutions of raw gutta-percha are properly speaking solutions of the pure resin only, and that the coloring matter is simply held in suspension in them. If chloroform be employed, it is possible to effect the separation either by adding benzöl so as to reduce the specific gravity, or by entangling the precipitate in some heavy insoluble powder. Carbonate of lead has thus been proposed for this purpose. But discarding chloroform altogether, on account of its high price and specific gravity, there remains to us the choice between benzöl and sulphide of carbon. This choice is easily made. Sulphide is by far the better solvent of the two; it is quite as cheap as benzöl and is more volatile. This latter is an important advantage.

Many months since, my attention was directed to a solution of gutta-percha in sulphide of carbon, which originally used as a cement, had been put aside and forgotten. The coloring matter had formed a compact deposit at the bottom of the bottle, and the supernatant liquor was of a very pale straw color; in fact, almost colorless. I at once made a new solution and found that in a narrow bottle, the precipitate soon completely subsided. I then poured my solution upon a sheet of glass contained in a wooden frame, and allowed the sulphide to evaporate, which it does with surprising rapidity. The films of gutta-percha thus obtained were so very beautiful and so very tenacious that I showed some of them at one of the evening meetings of the Dublin Chemical Club, and described the method by which they were produced, not doubting but this was new.

The next day, however, it was pointed out to me that I had been anticipated, and that Payen had obtained a like result in the same way.

Payen, however, seems to have adopted the method merely as one of analysis, and instead of allowing the precipitate to subside, filtered the solution. I find that a solution made by dissolving one ounce of raw gutta-percha in a pint of sulphide of carbon, gives a solution from which the clear portion may be decanted at the end of three weeks. Or following Payen it may be slowly filtered through paper under a bell-jar. And if this be supported on a porcelain dish containing mercury, there will be absolutely less evaporation of the solvent than there would be from the same surface of an aqueous fluid exposed to the air. This method of filtration seems to be capable of very general application to volatile fluids.

To form thin films, the solution is evaporated on a plate of glass, but as the layer at the moment of becoming solid, is powerfully contractile, care must be taken to cut it round the edge of the glass, in order to prevent its rupture from end to end.

A film of gutta-percha thus prepared, appears, by reflected light, of a delicate creamy white, and by transmitted light has an opaline semi-transparency. It is remarkably electric, producing when rubbed between the fingers, in the dark, a flash of light. These thin films have already been put to one useful purpose, that of replacing the ground glass of the photographic camera. It is well known to photographers, that in the image formed on ground glass the most luminous and best defined portion is central, the parts outside the centre being more or less hazy. But if for ground glass, a plain glass upon which a thin coating of the gutta-percha solution has been allowed to evaporate, be substituted, the image is found to be equally illuminated at all points. In microscopic photography, the advantage of this will be readily perceived.

Gutta-percha thus prepared is a mechanical mixture of the resin with water, which, as do most other resins, it absorbs from the air during the evaporation of the solvent. That this is the case may be at once proved by warming a glass plate bearing a film. The gutta-percha becomes perfectly transparent and adheres to the glass like a coating of varnish.

I think I may say in conclusion, that if this process be not already employed for the industrial production of white gutta-percha, there is no reason why it should not be. The solvent is cheap, and the manipulation simple, and if the greater part of the sulphide of carbon were removed by distillation, the cost would be reduced to a minimum.—*Chemist and Druggist.*

Rubidium and Lithium in Certain Plants.

BY W. A. WETHERBEE, M. D.

Though the compounds of rubidium have hitherto been discovered only in infinitessamal quantities, they are far more universally diffused than is generally supposed. Rubidium is not only detected in most of the mineral spring waters containing large proportions of the salts of lime, potassa and soda, but also in many of the vegetables containing such salts. For example, the chloride of rubidium (Rb Cl=121) has been found, in very minute proportions, with chloride potassium (K Cl), in the saline waters derived from the root of the common beet, and it has also been found in the ashes of coffee, tea, and tobacco, and in argols, or crude tartar, which is derived from red grape wines.

Undoubtedly the color of the beet and of red argols is, to a great degree, due to the presence of this compound, and it may yet also be shown that it is present in many other plants, the infusions of which are colored red or brown. In some of these plants, the quantity of the metallic salt is so extremely small that it can only be detected by spectral analysis, the two intensely red lines of which will be rendered visible by the combustion of one-thirty-thousanth part of a grain. These spectral lines, when once seen, can never be mistaken for those of any other metal; for, besides being of a peculiar red color, and consisting of two lines, they are also of a very low degree of refrangibility, being found at the extreme end of those rays which are the least refracted. The great volatility of this metal and its salts, may possibly account for the fact that many of the vegetable productions mentioned above are rendered comparatively colorless by being heated or boiled in water for a short time.

It should be remarked, however, that chloride of rubidium, when unassociated with other salts, is colorless, and it is only when in combination with certain other salts and organic matter that it produces the characteristic red color. The above remarks, in regard to the red color in plants being derived from their metallic salts, are, however, only theoretical, and experiments have not yet been carried far enough to establish the proof of their authenticity.

There are only two methods by which the salts of rubidium can be distinguished in organic combination from those of potassium, and these are, by the difference in the solubility of their chlorides, and by spectral analysis, by which latter means the metal rubidium was first discovered.

The salts of the metal lithium, though hitherto discovered only in very small quantities, and in only four or five native minerals, are, nevertheless, widely diffused, in minute proportions, in many spring waters, in Artesian wells which have been sunk to a great depth, especially through a stratum of carbonate of lime, and in many plants, among which are the ashes of several varieties of sea weed, those of the grape vine, tobacco, and of numerous others which grow upon peculiar granite soils in Germany and elsewhere. They have also been detected in the ashes of milk, blood, and muscular tissue, in the latter, three of which they probably are derived from certain vegetables upon which the animal has fed.

The forms in which this metal is chiefly found as an ingredient in plants are, chiefly, the oxide (Li O=15), and the chloride (Li Cl=42). Some of the carbonated mineral waters of Bohemia contain carbonate of lithia (LiO, CO^2=37), but it has not been discovered in this form in any organized body. By the spectral analysis, one-seventy-millionth part of a grain of this metal may be discovered. It is known by a single brilliant red line, while, as already stated, ribidium is detected by two lines.

No doubt many of the plants containing the salts of this metal, as well as those of rubidium, owe much of their ther-peutic virtue to the presence of these salts. The various compounds of lithium have recently come into use as medicinal agents, particularly in the treatment of diseases of the kidneys and bladder, and in certain morbid conditions of other functions of the system; and the facility with which it assimilates with vegetable and animal life, renders it the quicker in action, and less necessary to be administered in large doses than any other therapeutic substances.

Again, when many of the common salts, as, for example, several of the phosphates, which form ingredients in our daily food, are brought in contact with the lithium compounds, the latter are precipitated, and thus retained for a considerable time in the system, so that in this manner all their virtues are brought to bear. So popular has lithium become, in its various combinations, among the medical faculty, that it is now incorporated into some of the artificial waters which are sold in drug stores and saloons, and though these beverages do not, by their taste, reveal the presence of any of these salts, they are contained in sufficient quantities to be readily detected by any one of the usual tests by which they are known to chemists. One of the most common of these is by soaking the wick of a spirit lamp in these waters, and drying it, and then igniting it with alcohol, when it will burn with a red flame.—*Journal of Applied Chemistry.*

Salts of Strychnine separated by means of Phenic Acid.

M. Paul Bert submits a property of phenic acid to the attention of chemists, under the impression that it may have some industrial value, or be useful in medico-legal practice. He states that if a dilute solution of hydrochlorate of strychnine be shaken with a few drops of phenic acid, and the emulsion obtained be carefully filtered, the filtrate will be found to be divested of its poisonous properties, the whole of the strychnine being contained in the portion remaining in the filter. M. Bert has assured himself that strichnine may be thus removed with equal facility from putrefied animal matters. If the emulsion obtained by the agitation of phenic acid with the dilute solution of strychnine be treated with ether, the former is removed, whilst the limpid solution is found to contain the whole of the strychnine. M. Bert has not extended his experiments to many alkaloids, but leaves the determination of the value of the process to other chemists.—*Chemist and Druggist.*

On the Inflaming Point of Vapors.

Various fluids occurring in the trade volatilize, as is well known, at ordinary temperatures, forming explosive mixtures with atmospheric air; others give off vapors at a somewhat higher, but still comparatively low temperature.

W. R. Hutton, of Glasgow, has recently determined the degree of heat at which the vapors of a number of liquids catch fire from a burning candle, when it is approached to the surface of the fluid at a distance of 1·5 in. or 0·5 inch. The results of these experiments are recorded in the subjoined table:

		Inflaming point in degrees of Fah.	
	Specific weight.	At a distance of 1·5 in.	At a dist. of 0·5 in.
Sulphuric ether	0·747	below 53°	--
Bisulphide of carbon	1·270	" 53°	--
Petroleum benzine	0·706	" 55°	—
Benzole from coal tar, 90 per cent.	0·861	" 74°	71°
Crude paraffin oil	0·849	" 74°	72°
Crude naphtha	0·884	" 78°	74°
Whiskey	0·940	" —	85°
Wood naphtha	0·840	" 87.8°	81°
Crude parrafin oil	0·891	" 89°	84.2°
Crude naphtha	0·881	" 90°	86°
Dutch gin	0·930	" —	90°
Wood spirit	0·827	" 96·8°	84·2°
Illuminating naphtha	0·859	" 100°	91°
Wine spirit	0·817	" 104°	73°
Whiskey, 15 overproof	0·893	" 109°	83°
" 11 overproof	0·905	" 110°	84·2°
Kerosene	0·801	" 118°	110°
Light oil from coal tar	0·920	" 119°	109°
Spirit from resin	0·922	" 122°	105·8°
Turpentine	0·875	" 130°	119°
Sherry wine	0·993	" —	130°
Port wine	1·003	" --	130°
Refined paraffine oil	0·809	" 134°	123°
" "	0·814	" 138·2°	127°
Fusel oil	0·850	" 140°	129·2°
Oil from resin	0·987	above 212°	--
Heavy tar oil	0·950	" 212°	—

From this table it may be seen at a glance that the specific weight has, on the average, no influence on the temperature at which the generation of vapors takes place. The cause of this property may be inferred from the fact that the fluids in question consist of mixtures of various compounds, of which the lighter generally escape first. This is the case with the two kinds of crude naphtha and the illuminating naphtha, from which the benzole had been separated by distillation. The crude naphtha of the specific gravity of nearly 0·89, contained considerable portions of tarry substances and napthaline, but it nevertheless took fire at a lower degree of heat than refined naphtha, the specific weight of which did not exceed 0.86. That a liquid which contains but a small amount of a very volatile fluid, may be dangerous, is seen, for instance, in the experiment with the light oil from coal tar. This oil inflames by the light of a candle at 119° Fah. when approached to it within a distance of one and a half inches. When compared with the great inflammability of bisulphide of carbon or benzole, the tar oil may be considered as of little danger, but it is just as dangerous when it is taken into consideration that the great inflammability of bisulphide of carbon is well known, while the tar oil is looked upon as being comparative harmless. In the preceding case, the liquid portion, which generated inflammable gases at 119° Fah., did not amount to two per cent of the whole, and after their separation, vapors were not given off below 179.5° Fah.

Hydrogen and its Analogues.

On the 20th of Foburary, Dr. William Odling, F. R. S., delivered another of his course of ten experimental lectures at the Royal Institution, upon "Hydrogen and its Analogues."

On this occasion he gave attention principally to the combinations of hydrogen. He burnt a jet of pure hydrogen in a jar of chlorine gas; the flame increased in brilliancy, and the product of combustion was hydrochloric acid gas; Next he filled an inverted Florence flask with hydrogen, and, after lighting the gas at the mouth of the flask, he lowered it over a jet of chlorine issuing from a fine glass tube; the chlorine was then seen to burn inside the flask of hydrogen. Both the foregoing experiments show the surface nature of chemical action, for all flames are nothing but shells, the luminous layer being where the two gases come in contact; it does not matter which gas formes the jet or which forms the exterior envelope, as in any case the flame will be produced. A jet of hydrogen was next burnt in a large glass jas full of common air, and the union of the hydrogen with oxygen of the air produced water-gas or steam, which was condensed upon the cold sides of the large glass vessel. The same experiment was shown with pure oxygen in the place of common air, which is oxygen diluted with hydrogen.

Dr. Odling afterwards filled a glass globe with a running stream of coal gas, and, by means of a little piece of tube piercing the bottom of the globe, a jet of common air was admitted into the sphere; this jet was then lighted, so that the common air was seen burning in the middle of the atmosphere of coal gas, this being a reversal of the household experiment wherein jets of coal gas are made to burn in common air. As before stated, it does not matter which gas is outside the other, and the slow combination of the two forms a shell of luminous chemical action. If the two gases are well mixed together, and well lighted, combination takes place at once and they go off with a bang, which is the reason why a large mixture of coal gas with the air of a room may cause an explosion when a light is introduced; no explosion can take place unless the two gases be mixed before they are ignited.

When one volume of hydrogen unites with one volume of chlorine, two volumes of hydrochloric acid gas are produced, so there is no alteration in bulk. But when hydrogen unites with oxygen steam is first produced and then water; in the latter case there is great alteration in volume, and there is some alteration even in the transformation into steam, for two volumes of hydrogen uniting with one of oxygen produce only two volumes of steam. To show this by experiment, it was necessary that the vessel wherein the two gases united should be kept at such a high temperature that the steam produced could not be condensed into water. This was effected by first mixing two volumes of hydrogen with one of oxygen, in a large tube closed at its upper end, and inverted over mercury.

To maintain the requisite temperature a second and larger tube was inverted over the first; and the space between the two was kept full of the transparent vapor of boiling aniline, for aniline boils, at 180 deg. Centigrade—a temperature much higher than that of boiling water. The mixed gases in the inner hot tube were then fired by an electrical spark; they combined with an explosion after which the mercury instantly rose in the tube, and showed that the transparent steam or water-gas produced occupied only two-thirds of the space which had been taken up by the two gases while uncombined. After showing how hydrogen will decompose vapor of tetrachloride of carbon, under the action of heat, by uniting with the chlorine to form hydrochloric acid, the lecturer showed how the ignition of a mixture of hydrogen with nitrous oxide or laughing gas will set up decomposition, resulting in oxide of hydrogen and nitrous gas.

Dr. Odling next took a jar of chlorine gas, and shook up in its interior a little of the most volatile spirit which can be distilled from petroleum. When this mixture of gas and vapor was ignited the hydrogen united with the chlorine, producing at the same time a deep red light and volumes of black smoke.

Another very neat experiment exhibited by Dr. Odling was the cumbustion of oxygen and ammonia. Some strong liquid ammonia was placed in the bottom of a glass flask, and a stream of oxygen was directed upon the surface of the liquid by means of a glass tube passing down the neck of the bottle, till it just touched the surface of the ammoniacal solution. Upon dropping a light into the flask the mixed oxygen and ammoniacal gases caught fire, and burnt brilliantly upon the surface of the liquid. Substances rich in hydrogen and carbon, such as wood and tallow, will usually burn vividly in oxygen or common air; but when the exterior gas is highly hydrogenous, the substances easy to burn therein much usually] be rich in oxygen. Chlorate of potash, which is very rich in oxygen is incombustible in common air; but when Dr. Odling made some chlorate of potash red hot in a metal spoon, and immersed it in a glass jar filled with coal gas, the chlorate of potash burnt away brilliantly.

In this summary the best of a very large number of experiments have been described, and the whole of them were expeditiously performed by Dr. Odling in less then one hour, accompanied by very clear explanations of the principles involved.—*London Daily Telegraph.*

Tobacco.

The following statement of the relative consumption of tobacco by the male population of the different countries, has been kindly furnished by a friend.

It is said that the annual consumption of the weed in ounces per head is nearly as follows:—

In Great Britain	60 to 70	oz.
France	80	"
Belgium	150 to 160	"
Holland	130	"
Denmark	120	"
Norway	100	"
Sweden	70	"
Russia	40	"
Austria	110	"
Sardinia	40	"
Tuscany	30 to 40	"
Papal States	30	"
Spain	70 to 80	"
Portugal	50 to 60	"
United States	120	"

Zolleverein...the largest quantity per head.
—*The Probe.*

CANADIAN PHARMACEUTICAL SOCIETY.

PRESIDENT, - - - WM. ELLIOT, Esq.

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

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

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

The JOURNAL *is furnished* FREE *to all members.*

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

HENRY J. ROSE, *Secretary.*

CANADIAN MEDICINAL PLANTS.

PRIZES.

PRIZES are offered for collections of indigenous medical substances of vegetable origin, as follows:—

1ST PRIZE—FIFTEEN DOLLARS—a copy of *Griffith's Medical Botany*, and *Certificate.*
2D PRIZE—TEN DOLLARS—a copy of *Wood's Class-Book of Botany.*
3D PRIZE—FIVE DOLLARS—a copy of *Wood's Class-Book of Botany*, and *Certificate.*

Conditions of competition to be—

1st. *Competitors to have been engaged in the drug trade, and for not more than three years, and to be members of the Pharmaceutical Society previous to 1869.*

2. *Specimens to be forwarded (carriage paid) to the Secretary of the Society, Toronto, by 1st September, 1869, with a sealed letter, enclosing the address of the competitor, a certificate from his employer that the collection has been made by the competitor solely within a year; that he has been engaged in the drug trade during that time, and that he has not been more than three years so engaged at the date of this notice.*

3. *Each specimen is to be carefully prepared ready for sale or use, and packed in a paper bag. On each shall be written legibly, the common and scientific names, the date and locality of collection, and a private mark, which shall also be put on the outside of the letter accompanying the collection.*

4. *Three judges shall determine the order of merit; they shall be at liberty to withhold any or all of the Prizes, if the collections do not warrant an award, and to select such specimens as they may deem meritorious for the Museum of the Society, which specimens will have the name of the collector put upon them.*

5. *The points of competition to be number of specimens, condition, correctness of naming, and general excellence; quantity a secondary consideration.*

Collections to which Prizes are awarded wil be sent to the Provincial Exhibition at the expense of the Society; and any Prizes secured there, shall be for the benefit of the collector.

Address—Collections,
Canadian Pharmaceutical Society,
H. J. ROSE, *Secretary,*
September 15th, 1868. *Toronto.*

THE CANADIAN
Pharmaceutical Journal.
E. B. SHUTTLEWORTH, EDITOR.

TORONTO, ONT., MAY, 1869

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

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

All communications connected with the paper to be addressed, post-paid,
"EDITOR CANADIAN PHARMACEUTICAL JOURNAL, TORONTO."

BY an arrangement with the Printing Committee, we shall be enabled to devote a portion of our time, during the day, to the furtherance of the interests of this JOURNAL. Heretofore, our duties in the Laboratory have precluded anything but the employment of "midnight oil" for the accomplishment of our editorial duties. We have, however, found this means of illumination inadequate to the purpose of sustaining so thriving a concern as our paper promises to be, and, moreover, not over conducive to health. "All work and no play makes Jack a dull boy," and as we have no desire to experience this result ourselves, much less to inflict its consequences on our readers, we have adopted our present course.

We hope, by this arrangement, to make the JOURNAL of greater value to the community, and shall spare no effort in doing our best to this end. We would ask the co-operation of members of the Society, in extending our circulation, and communicating interesting facts, which may come under their observation. Thus aided we are certain of success.

THE BOTANICAL PRIZES.

It is now full time for our young friends to bestir themselves in regard to these prizes. The last traces of a dreary winter have disappeared, and on every hand the welcome signs of spring are to be found. Every day brings forth new accessions of opening buds and leaves, as Nature once more resumes her cheerful garb of green. Although there is but little to collect at this season, there is much to observe. Even by those who are not pre-inclined to botanical study, the rapid changes and speedy development of vegetation at this time are remarked with interest. The tender shoot, just peeping from the ground, in a few days takes on the semblance of a stately plant; while opening spring flowers, blooming fresh to-day, are, by to-morrow, withered and fallen. Our young friends must note these changes, and the order of their occurrence; the locality of the plant, and their times of springing up and flowering. Nothing can be more delightful than a walk, note-book in hand, to gather specimens, instruction, and health in the green woods.

We regret exceedingly that R. W. Elliot, Esq., the donor of the prizes, is absent in Europe, as it is probable that he would give definite directions regarding the specimens which should be collected at this time. However, if those who intend to compete will refer to the May number of the JOURNAL for 1868, they will find an excellent paper, written by Mr. Elliot, appropriate to the season.

We trust that a large number of apprentices will enter the lists, and are quite sure that even the unsuccessful candidates will be a thousand times repaid for the time or trouble they may expend. The American *Journal of Pharmacy*, in noticing the conditions attending the prizes, says:—"This method of competition is calculated to be of great benefit to the students, as in order to name their specimens they must learn the plant yielding them, and by connecting the two in the mind they become more thoroughly acquainted with their history and character. This method is well worthy of adoption by all our colleges of pharmacy."

We notice in the last number of the *Pharmaceutical Journal* (England), the announcement of a botanical prize, offered by the home Society, for the best Herbarium, collected in any part of the United Kingdom, between May, 1869, and June, 1870. The prize takes the form of a "Silver Council Medal;" and should there be more than one collection worthy of award, a second prize, consisting of a bronze medal, and also certificates of merit, will be given at the discretion of the Council. The collections are to consist of flowering plants and ferns, arranged according to the natural system of De Condolle, or any other natural method in use. Some work on British botany must be followed (such as that of Babington or Bentham), and the name of each plant, its habitat, and the date of collection, to be stated on the paper in which it is preserved. Associates, registered apprentices, or students of the Society, only, are allowed to compete; nor must the age of the competitor exceed twenty-one years.

Our apprentices in Canada have at least equal chance with those of Great Britain; and in this instance the advantages of larger and more numerous prizes are a trifle in our favor. We hope, when the day of adjudication comes, that for good preservation, accurate naming, and full collections, our Juniors may bear away the palm.

POISONS.

The interpretation of this word has been the source of no little trouble and perplexity to the druggists of England since the passing of the Pharmacy Bill. By a clause of that enactment, it is rendered unlawful for any person whatever to sell any of the poisons, or their preparations, enumerated in the first part of an attached schedule, without affixing a label distinctly marked "Poison" on the package containing such substance. It so happens that opium and its preparations are included in the category, and here has arisen the principal difficulty. The well-known popular remedy, paregoric, is undeniably a preparation of opium, and as such is distinctly enumerated in the British Pharmacopœia. It has been justly asserted that to affix a poison label on such a comparatively harmless article would not only be prejudicial in alarming patients about taking a useful medicine, but would also familiarize the public mind with a very significant word, and thus detract from its cautionary value.

We all know the effect of this word when attached to an ounce of arsenic, or a bottle of strychnine; and when surmounted with the piratical skull and cross bones, standing with a deathly whiteness from a black ground, it is certainly calculated to strike terror to the heart of even the most determined suicide. What, then, shall we say when we see this appalling emblem attached to a bottle of paregoric which stands in a familiar corner of the cupboard, and is dispensed by the hand of a mother for the ailments of the household? Do we start back to see an infant take poison by the spoonful? There is little cause for alarm; the label is of no significance, and the word "Poison" has become a dead-letter.

In this way the British public have reasoned, the druggists have been perplexed, and the framers of the Pharmacy Act harrassed with inquiries. The result has been that a number of "case-raising points" have been prepared by the Council of the Pharmaceutical Society, and submitted to the opinion of the Privy Council of Great Britain. The following answer has been received:

Medical Department of the Privy Council Office,
6th March, 1869.

The Secretary of the Pharmaceutical Society,
17 Bloomsbury Square, W.C.

SIR,—I have laid before the Lords of Her Majesty's Council the statement prepared for that purpose by the Solicitors of the Pharmaceutical Society, and put into my hands by the President of the Society, on the subject of a difficulty which the Society feels in applying the language of the Pharmacy Act, and particularly of its Schedule A, to the case of such pharmaceutical compounds as contain some scheduled "poison" in extremely small and practically non-poisonous quantity.

My Lords having given their best consideration to the subject, are of opinion that the "preparation" of a poison in the Pharmacy Act, 1868, means a compound which, like the poison of which it is a preparation, is in itself deadly or dangerous, and that it does not mean a compound which is in itself perfectly harmless, although into its composition may enter a poison, or the preparation of a poison, which taken alone would be dangerous or deadly. My Lords apprehend that questions of fact must be dealt with as they arise; for it is possible to take so much of a compound perfectly harmless if taken in reasonable quantities (*e. g.* carbonate of soda), as to destroy life, and it is possible that a particular paregoric lozenge might contain a deadly amount of poison; but it seems to their Lordship that, for general purposes, and as matter of legal interpretation, these extreme and barely supposable cases may be disregarded, and that the Pharmaceutical Society may safely act upon the test given above.

My Lords, however, are advised that it is not feasible to define the precise proportion of poison in any preparation which may bring it within the Act.

I am, Sir, your obedient servant,
JOHN SIMON.

We are glad that this vexed question is so far settled; not only as regards the English druggists, but ourselves also, as a similar wording to that of the act of Great Britain occurs in the proposed Pharmacy Bill of Ontario, and we have now an opportunity of having the matter rectified before further legislation takes place.

EDITORIAL SUMMARY.

PRESERVATION OF HERBS.—A writer in the *Pharmaceutical Journal* (Eng.) recommends for this purpose the addition of ten per cent. of spirit to the recently powdered herb, the damp powder being at once put into wide-mouthed stoppered bottles. This plan is said to answer thoroughly. It was found that leaves of digitalis, prese served in the ordinary way, at the end of a year after gathering became comparatively inert, but by the above treatment their virtue was unimpaired.

CATHARISM.—This is a new scientific term intended to define the influence exerted by chemically clean surfaces. Charles Tomlinson, F.R.S., F.C.S., has recently delivered a lecture on the subject, before the Chemical Society, London, in which he endeavours to attribute various phenomena which have heretofore puzzled philosophers to this influence. He reviews the experiments of Oersted, Schönbein and Liebig on the liberation of gases or salts from solution, by contact with certain bodies. For instance, Oersted remarked that dilute hydrochloric acid could be dropped on a solution of carbonated alkali, causing only momentary effervescence, and the two liquids might remain undisturbed for hours without further appearance of gas, but the moment a solid was introduced, such as a platinum wire, a glass rod, the finger, or any minute speck of solid matter, such a solid not only became instantly covered with gas, but discharged gas briskly from its surface. Oersted was unable to account for this. Again, Schönbein found that gas was given off abundantly where copper, brass, iron, or silver wire were put in a very dilute solution of nitrous acid, and that the escape of gas was far too copious to be accounted for by chemical action; moreover, a bit of pine wood acted with as much energy as brass wire, but if the wood was boiled no effect was produced. Schönbein thought this was on account of the wood being deprived of air, by boiling, and that solids act by carrying down air, into which the gas expands, and when deprived of air they are inoperative.

Mr. Tomlinson explains these and kindred phenomena, by his new principle of catharism. He says,—

When bodies act as nuclei in separating gas, or salt, or vapour from solution, it is because the gas, or the salt, or the vapour has a stronger adhesion to, or attraction for, the surface of the nucleus, than the liquid portion of the solution has for such surface. If the nucleus be chemically clean, there is no appreciable difference between the adhesion of the gas and such surface, and the liquid that holds the gas in solution. Hence there will be no separation of gas, because the solution adheres perfectly and as a whole to a catharized surface.

Bodies that are exposed to the air, and to the products of respiration and of ordinary combustion, that are handled, or wiped with a cloth, contract more or less of a greasy film, which lessens the attraction between the liquid portion of a solution and such surface, while the attraction between the gas, etc., of such solution remains the same as before. Hence there is a separation of gas, etc., from solution, since gas or salt, or vapour will adhere perfectly to a greasy surface, and the attraction between such a surface and a gas is so strong as, in some cases, to produce chemical decomposition, as when chloride of nitrogen is touched with an oily or greasy surface.

The dust of a room, which is constantly floating in the air, is more or less contaminated with a greasy or organic matter, and acts as a nucleus. If such dust be collected on a filter, and washed with a solution of caustic potash, rinsed with water and dried out of contract with air, it ceases to act as a nucleus.

A nucleus, then, may be defined as a body that has a stronger adhesion for the gas, or the salt, or the vapour of a solution, than for the liquid that holds it in solution.

I believe this new prin[illegible] of catharism is sufficient to generalize and account for, in a scientific manner, the numerous facts already introduced to your notice. When Liebig shook a bottle half full of a carbonated mineral water, the gas was liberated by coming into contact with the unclean sides of the vessel. When he struck his hand on a glass containing sparkling Moselle or other gaseous wine, he not only precipitated some of the unclean dust of the air upon it, but he also shook the wine against the unclean sides of the glass. If a bottle of soda water be gently poured into a catharized glass, not a single bubble will become attached to the sides. If water in a similarly clean glass, containing a clean glass rod, or wire, be put under the receiver of an air-pump, and the air be exhausted, not a single bubble of air will attach itself to the sides of the vessel, or to the glass rod, or to the wire. When Schönbein found a bit of pine wood, by long boiling, inactive in liberating gas from solution, it was not that the boiling had driven the air out of the wood, but that the boiling had catharized the wood. There is not a greater mistake than to suppose the air to have an influence in setting gas, or salt, or vapour free from solution. When air appears to act it is merely as a carrier of some unclean mote or speck of dust that is floating in it. And this explains the fact noticed by Löwel and others, that supersaturated saline solutions can be kept longest without crystallising in narrow necked vessels, the time being long in proportion to the narrowness, so that if the mouth of a vessel be contracted to a capillary bore, the solution can be kept as in a close vessel. I have found that highly charged supersaturated saline solutions in wide-mouthed flasks can be opened in a garden or a field in the country where the air is free from the dust and motes of a room, and be kept open for a long time without crystallising, and when crystallisation does take place, a nucleus is to be found in the shape of a small fly or other unclean object."

Svapnia and Sweet Quinine.—Both these preparations are deservedly coming into use, and are fast growing in favor with the medical faculty. The intensely bitter taste of ordinary sulphate of Quinine has been a great drawback to its employment—some patients being completely unable to conquer their repugnance to it. This persistent bitterness has been overcome, or disguised, in the above preparation, but the virtues of the quinine remain unimpaired. With regard to "Svapnia"—which, by the way, is pronounced Esz-vap'-nia—we have merely to say that it is an improved and purified form of opium, and as such is sure of a steady demand. It is simply opium deprived of inert and injurious matter, and of uniform and reliable strength. This is all that is required, and, even now, Svapnia bids fair to become a solid rival of the famous "liquor" of Battley.

Chloroform, and a New Method of Administering it. By A. M. Rosebrugh, M.D., Toronto.

This is the title of a pamphlet which has just reached us, containing the substance of a paper read before the Medical Section of the Canadian Institute in November last. The subject is treated in a very concise yet thorough manner, and the portion relating to the administration of chloroform is worthy of the attention of all medical men, as marked advantages of precision and simplicity may be secured by pursuing the author's method of administering this sometimes dangerous anesthetic.

CANADIAN PHARMACEUTICAL SOCIETY.

The regular monthly meeting was held at the usual place on the 5th inst. Mr. Shapter occupied the chair.

Minutes of last meeting was read and adopted, and the following were elected members of the Society:—

PRINCIPALS.

Gordon Servis,..............Iroquois.
M. Wilson,..................Madoc.
F. A. Gemmell,..... ....Sarnia.
Paul Zoellner, ...Tavistock.

ASSISTANT.

E. Miller, ...Dresden.

The question of the qualifications, if any, requisite for membership in the Society, was again discussed; some advocated the requirement of a fair knowledge of the business of a Pharmacist, in a proposed candidate. The question was decided by the adoption of the following, which Mr. Shuttleworth gave as a notice of motion:

"That Article II of the Constitution, regarding admission of members, be amended, and that applications shall in future be endorsed by a member of the Society."

The report of the Printing Committee was then read, as follows:—

REPORT OF PRINTING COMMITTEE.

The year having expired in which the Printing Committee undertook to conduct the publishing of the Pharmaceutical Journal, they deem it their duty to report to the Society the result; and as the term of their appointment has expired, it becomes their duty to explain to the Society the financial position, and to ask that they may be relieved from further responsibility in the matter; and that a new Committee be appointed to take their place. The Journal thus far has not paid its expenses, but the appropriation made by the Society, viz., three-fourths the amount of subscription of country members has not all been used; and they feel so far gratified with the result; they would also state, that the guarantee fund subscribed by city members last year will not be available for the coming year (unless re-subscribed); so that for the next year the undertaking will have to depend upon the Society for its success.

We may here mention, that the Committee have made one change in conducting the Journal that will entail a somewhat larger expenditure for the coming than for the past year. Mr. Shuttleworth, who gave a considerable time to the editorial department, gratuitously, found it impossible to continue it without trespassing too much on his other engagements, has therefore to ask some compensation for the future. The Committee therefore deemed it advisable to dispense with the services of Mr. Trout, who received three hundred dollars, for the financial management, and place both departments in charge of Mr. Shuttleworth, at a salary of five hundred dollars per annum, which they considered would be more economical than having one person for each department. The Committee would therefore recommend, that a resolution be offered, placing the whole of the country fees at the disposal of the new Committee, so that there may be no embarassment in publishing the Journal, which they think is all important to the prosperity of the Society.

All of which is respectfully submitted.

Wm. H. Dunspaugh,
Chairman of Printing Committee.

Financial Statement.

Receipts.

Advertisements	$502 80
Subscriptions	92 48
Papers sold	12 40
Balance paid from appropriation by Society	357 62
	$965 30

Expenditure.

Printing, Robertson & Cook	$560 75
J. M. Trout, salary	300 00
Com. on advertisements	35 00
Exchanges	21 88
Postage	38 75
Stationery	5 79
Protest on draft	3 13
	$965 30

Outstanding for advertisements	$110 08
No. of members receiving Journal	281
" subscribers not belonging to Society	83

On motion, the report was adopted.

Mr. Shapter having vacated the chair, which was taken by Mr. J. L. Howarth, moved a vote of thanks to Mr. Shuttleworth, for his valuable services during the past year; and, in doing so, spoke in complimentary terms of the talent and time which Mr. S. had gratuitously devoted to the Journal project during the first year of its existence, stating how much the present success of the Journal was due to his efforts. His remarks were fully endorsed by the meeting, and the motion acknowledged by Mr. Shuttleworth.

It was then moved by the Treasurer, and seconded by the Secretary, That in accordance with the report of the Printing Committee the entire amount of the subscriptions of non-residents be placed at the disposal of the Printing Committee for the ensuing year. —Carried.

It was then moved that the Printing Committee be dissolved, and the following appointed for the ensuing year:—

Mr. R. W. Elliot.
" W. H. Dunspaugh.
" J. T. Shapter.
" J. L. Howarth.
" H. P. Brumell.
" N. C. Love.
" C. E. Hooper.—Carried.

The paper for the evening was then called for, and Mr. Ruston read a useful paper on Syr. Ferri Iodidi, which was placed in the hands of the Editor, and received a warm expression of thanks, after which the meeting adjourned.

H. J. Rose, *Secretary.*

Correspondence.

New Form of Heating Apparatus for Pharmaceutical Purposes.

To the Editor of the Canadian Pharmaceutical Journal.

DEAR SIR,—I send you a description of a heating apparatus, devised by myself, which I have found to answer admirably, both from its simplicity, and also from the facility with which a constant and easy regulated heat can be obtained, for any length of time, at a trifling expense, as compared with that of alcohol, which we have to use during the summer, when fires are not in use.

Take a common coal oil lamp, with the common B, burner; have a double drum made from two copper tubes, about 8 inches long—the one, 1½ inches in diameter, the other 2 to 2¼ diameter—the smaller one placed inside the larger; the space between them closed, and all well soldered, so as to be watertight. A suitable copper vessel, or tin with copper bottom, say 7 inches wide by 6 inches deep, or any convenient size, to act as a water or steam bath, is to be attached to the top of the drum, by three small tubes inserted in the end, and passing through the bottom of the large vessel, leaving a space of half or five-eighths of an inch between the bottom of the vessel and the top of the drum. The apparatus may be supported on a tripod, or any other way, high enough to allow the lamp to be placed with the conical top of the burner inside the tube or drum—the smaller tube having been left to project half an inch below the outer one, so that it may go down clear to the inside of the burner. Having filled the drum by pouring water into the large vessel, allowing it to rise from one-fourth to one-half an inch in depth, place the lighted lamp in its place, and in a very short time the water will boil strongly—in mine, 20 oz. boil in ten minutes.

The lamp must be carefully trimmed, and it is well to try it with a glass chimney, to ensure a nice flame; for if it be uneven, and the least point of flame touches the tube, the apparatus will smoke.

The flame can be regulated by turning it up until it is seen to smoke a little, and then lowering it to ensure its burning clear.

This gives, as will be seen, a great heating surface, and by confining the steam by having the vessel containing the matter to be heated made to fit very close into the mouth of the other, a heat much above that of boiling water can be obtained. By leaving it open, and regulating the flame of the lamp, any desired temperature, within certain limits, can be insured; whether for infusions or decoctions. Ointments can be nicely made in a common earthen bowl set over the vessel, and it is also handy for a glass retort.

I remain,
Yours respectfully,
THOS. CARRE.

Meaford, April 10th, 1869.

COD-LIVER OIL.

CAROLS OF COCKAYNE, BY HENRY S. LEIGH.

On the bleak shores of Norway, I've lately been told,
Large numbers of cod-fish are found,
And the animals' livers are afterwards sold
At so many "pfennings" per pound;
From which is extracted, with infinite toil,
A villainous fluid called cod-liver oil.

Now, I don't mind a powder, a pill, or a draught—
Though I mingle the former with jam,—
And many's the mixture I've cheerfully quaff'd,
And the pill I have gulp'd like a lamb.
But then I envelop my pills in tin-foil,
And I can't do the same with my cod-liver oil!

In the course of my lifetime I've swallowed enough
To have floated a ship of the line,
And it's purely the fault of this horrible stuff
That I've ceased to enjoy ginger wine.
For how can you wonder to see me recoil
From a liquor I mix'd with my cod-liver oil?

There are few deeds of daring from which I should quail—
There are few things I'd tremble to do;
But there's one kind of tonic that makes me turn pale,
And quite spoils my appetite, too:
But you see, just at present, I've got none to spoil,
So I don't mind alluding to cod-liver oil!

Impurities of Chloroform.*

Pure chloroform is neutral to test-paper; its specific gravity is 1·49 to 1·5, and it boils at 1·40 F. If dropped into distilled water, it collects at the bottom in transparent globules. When it is mixed with an equal volume of officinal sulphuric acid in a glass-stoppered bottle, no heat is evolved; and after standing for twenty-four hours, only a faint yellow colour is imparted to the acid. On evaporating three or four drachms of pure chloroform, from a porcelain plate, no pungency or empyreuma is observed, but a slightly aromatic odour; and the plate is covered with a film of moisture without odour or taste.

The most common impurities and adulterations of chloroform are: alcohol; ether; chlorinated pyrogenous oils; hydrochloric and hypochlorous acids; chlorine, and Dutch liquid.

Alcohol and ether reduce the specific gravity of chloroform below the normal standard; and the impure liquid when dropped into distilled water, falls to the bottom in milky globules (Mialhe) A solution of bichromate of potassa in sulphuric acid becomes green, on the addition of chloroform containing alcohol (Procter); and almond oil is rendered milky by the admixture of chloroform having 5 or 6 per cent. of this impurity. (Soubeiran). Albumen (white of egg) is coagulated by chloroform, if alcohol is present. Chloroform that contains alcohol or ether is diminished in volume by agitation with water; and when potassium or sodium is thrown into the adulterated article, sharp, acrid fumes are evolved. Ether may also be recognized by its smell; and by tinging drops of chloroform dull-red, which have been added to an aqueous solution of iodine (Berchon).

Chlorinated pyrogenous oils are detected by shaking together equal volumes of the impure article and pure, strong sulphuric acid; a brown coloration is produced. These impurities result, most frequently, from the use of methylated, instead of rectified spirits, in the preparation of chloroform.

Hypochlorus acid and chlorine are recognized by their odour and bleaching power.

Hydrochloric acid is detected by its acid reaction, and after its extraction with water, by the ordinary tests.

The presence of Dutch liquid is revealed by the addition of an alcoholic solution of potassa; volatile chloride of acetyl is evolved, of a disagreeable odour.

* From "Chloroform, and a New Method of Administering it." By A. M. Rosebrugh, M.D., Toronto.

Denton on the Origin of Petroleum.

Professor Denton says that petroleum is not a *coal* oil, but a *coral* oil. Among his arguments in support of this theory are the following.—It is rarely met with in a coal district. Not even a *smell* of it has Prof. D. perceived in any of the coal mines which he has visited. If it is from coal it should never be found in rocks older than the coal measures. The contrary is true. "In this country nearly all the oil hitherto obtained has been from beds that lie below the coal measures, and sometimes at great depth below them. On Oil Creek, in Pennsylvania, it is found by boring in shales and sandstones, sometimes to a depth of one thousand feet; these beds belonging to the Chemung group of the Devonian formation, and many hundred feet below the coal measures. At Enniskillen, in Canada West, where the oil has at one time came up in springs, and overflowed, leaving a thick bed of asphaltum covering the ground for an acre, the limestone in which borings are made contains characteristic fossils of the Hamilton group of the Devonian formation. The oil wells in Western Kentucky, and in some parts of Tennessee, are in the Trenton limestone—that is, in the lower Silurian formation. The same oil floats on the surface of a limestone quarry near Chicago, the limestone belonging to the Niagara group of the Silurian formation; showing conclusively that it has no necessary connection with coal."

The immense quantity of free oil forbids the belief that it could have been produced from sea plants. It would require large subterranean lakes of it, to pour out the thousands of barrels which some wells have daily yielded. The sea-weeds of the Silurian and Devonian times contained so little bituminous matter that their impressions do not even darken the light-coloured shales in which they are found.

Against the theory that it has been distilled from bituminous shales may be said, that for this strong heat is required; and generally, where it is found in greatest abundance, there is the least appearance of igneous action.

Professor D. has in his possession numerous specimens of fossil coral from Devonian and Silurian rocks, the honeycomb cells of which are filled with this oil. He has seen the same from different parts of the country. We quote a portion of his conclusion: "I have found it repeatedly in these corals, and in no other part of the rock invariably accompanying the corals, and never connected with any other fossil; these corals frequently in the centre of limestone blocks. Reefs of such coral would furnish oil in quantities sufficient to account for the immense deposits that have been discovered. Preserved by them in compact bodies, the oil taking up at least half the space of the coral reef, we can readily suppose that when the cells were crushed by the superincumbent weight of rock, or during upheavals and subsidences, cavities and crevities in the earth's interior would be filled by it. It is, then, an animal production, and not a vegetable one."—*American Exchange.*

Baron Liebig "on a New Method of Bread-Making."

Baron Liebig has just made some important researches on a new method of bread-making. He remarks on the stationary character of this art, which remains to the present day much in the same state in which it was thousands of years ago. He dwells upon the sanitary importance of the mineral constituents of grain, and the necessity of a sufficient abundant supply of them in bread. These are best found in certain kinds of black and brown bread, which are therefore, more wholesome than the white bread that is nevertheless preferred by most people (especially by the lower orders) on account of its better appearance and superior palatableness. The problem has hence arisen, how to provide a beautiful white bread which shall contain all the essential mineral constituents of black bread. These mineral constituents (phosphate of potash, lime, magnesia and iron) are introduced into the bread by the use of the baking-powder invented by Professor Horsford, of Cambridge, in North America. This baking-powder consists of two powders—the one acid, the other alkaline. The acid powder is phosphoric acid in combination with lime and magnesia; the alkaline powder is bicarbonate of soda. Two measures made of tinned iron, the larger one for the acid powder and the smaller one for the alkali, are employed. When bread is required to be made, every pound of flour is mixed with a measure of the acid powder and a measure of the alkali powder, and sufficient water added to make dough, which is presently made into loaves and baked. In one and a half to two hours bread may be made by this process. The chemical change which takes place will be easily intelligible; carbonic acid is generated and phosphate of the alkali is formed at the same time. The essential feature in Horsford's invention is the economical getting of phosphoric acid in the shape of a dry white powder. This is done by taking bones, burning them, and then treating the well-burnt bone-earth (which consists of phosphate of lime and magnesia) with a certain quantity of sulphuric acid, so as to remove two-thirds of the lime and leave a soluble superphosphate of lime. The sulphate of lime which results from the action of the sulphuric acid is seperated from the rest by filtration, and the solution subsequently concentrated by evaporation, and when it becomes very concentrated, mixed with a certain quantity of flour, and dried up. The mixture of flour with the superphosphate admits of being reduced to the finest powder, and constitutes the acid powder just referred to. It will be observed that the alkali-powder contains soda, whereas potash is required in order to furnish the right kind of mineral salts. Liebig proposes to rectify this defect by using a certain quantity of chloride of potassium along with the alkali. Chloride of potassium is now tolerably cheap, owing to the finding of immense quantities of it at Strassfurt. Baron Liebig in order, as he says, to avoid being bothered, has appointed Herr Zimmer, of Mannheim, and Herr Marquart, of Bonn, his agents for his new baking powder; and those interested may if they like, get it from them.—*British Medical Journal*, Jan. 2, 1869.

Magnesium Light.

Late scientific intelligence from England expresses the belief that magnesium, by new processes of manufacture about to be introduced, will be brought down to a shilling an ounce retail. At this price its use in lamps, in the shape of ribbon of the thickness of heavy paper and a tenth of an inch wide, will be decidedly economical. The supply of magnesium ores and other compounds is unlimited. Dolomite, one of the commonest rocks in the Southern States, and extending in a vast range through New Jersey, New York, Western Massachusetts and Vermont into Canada, contains 45·65 parts of carbonate of lime.

From the magnesium carbonate the chloride is prepared, and from that the metal is eliminated; or the chloride of magnesium can be obtained direct from sea water, and then reduced to metal by the usual process. It is estimated that a ton of sea water contains two pounds of the metal. The sources of supply are thus shown to abound all about us; and the only question involved in the use of the metal for illuminating purposes is that of the cost, and that question, as we learn, is on the point of being satisfactorily answered.

As our readers may not understand the working of the magnesium light, we will explain that the metal, in the form of a thin ribbon, weighing but little more, for its bulk, than a delicate wood shaving or a strip of writing paper, is coiled about a drum, and fed by simple clockwork in the flame of a small alcohol lamp. The heat of the flame ignites the metal, and it burns slowly and regularly with the purest imaginable white light equal to seventy-four stearine candles and upwards, according to the size of the ribbon. As it has the essential characteristic (the actinic power) of the solar rays, photographs are easily taken by it. It is, in fact, an imitation of daylight, and therefore specially adapted to the eyes; whereas, the ordinary gas is known to be highly injurious to those organs.

So soon as magnesium can be furnished cheaply enough, Yankee ingenuity may be trusted to invent some still cheaper apparatus for burning it up. It takes but little faith to look with confidence to the introduction of the magnesium light (unless a better one can be introduced) as a common substitute for gas. That man is not rash who would predict that at some day, perhaps not far off, gas will become as obsolete as rush-lights now are in civilized communities.—*N. Y. Jour. of Commerce.*

Ambergris.

This singular substance is one among those derived from animal sources that are employed in the perfumer's art, and although its origin would seem to preclude its use by the fastidious, the same objection would equally apply to musk, the product of the civet cat or musk deer, which if not an excretion is a secretion intended probably, as is the offensive liquid ejected by the skunk, as a means of defense. Ambergris, or "gray amber" as its name denotes, is simply and only a portion of the excreta of the sperm whale, *Physeter macrocephalus*, resulting from disease. It is considered generally to be a result of morbid secretion of the whale's liver and is probably produced also by other oceanic mammalia. It is usually found floating on the surface of the sea in those parts of the ocean most frequented by the spermaceti whale; a small barren island off the coast of Yucatan, having received its name of Ambergris from the quantity of that substance found on its shores.

Whale fishers look for it in the intestines of the whale, and its value is so great that whalemen pursue with eagerness the sickly cetaceæ although they promise a scant return of oil. It is amorphous, or in roundish pieces frequently formed in layers, of a grayish color—whence its name—with streaks of whitish yellow, brown, or black. It has a waxy texture and when warmed emits a pungent odor. It is for this quality it is so highly esteemed. It has been sold for its weight in gold. It is very scarce and seldom appears except as "essence of amber" or "extrait d'ambre," forms of perfumery having this material for their base and bearing a very high price.

Its discovery is not at all new. It is pretty certain it was known as a rare perfume in the fifteenth century, for Sinbad the sailor, being wrecked somewhere in the Indian Ocean, says:

"Here is also a fountain of pitch and bitumen that runs to the sea, which the fishes swallow, and then vomit it up again, turned into ambergris."

Piesse in his "Art of Perfumery" does not rank the perfuming value of this substance highly; for he says: "A modern compiler, speaking of ambergris, says 'it smells like dried cow dung.' Never having smelled this substance we cannot say whether the simile be correct; but we certainly consider that its perfume is most incredibly overrated; nor can we forget that Homberg found that a vessel, in which he had made a long digestion of the human fæces, had acquired a very strong and perfect smell of ambergris, insomuch that anyone would have thought that a great quantity of essence of ambergris had been made in it. The odor was so strong that the vessel was obliged to be moved out of the laboratory."

We cannot agree with Homberg, for when first, some twenty years ago (and recollections of scents are among the most tenacious), we tested some fragments just brought in by a whaling ship, we very much admired the aroma, but—we are also partial to musk.

It is generally found in small quantities of only a few pounds or perhaps ounces in weight, but large masses have been discovered, one weighing 174 lbs. having been purchased in the East Indies by the Dutch, and a mass of 237 lbs. being obtained by the French East India Company. Lately, however we read that Captain Timothy C. Spaulding, of the bark *Elizabeth* of New Bedford, while coming southwest of Madagascar, struck a very large sperm whale. On opening the whale they had the good luck to discover 285 pounds of ambergris—worth on the spot $20,000

Another New Bedford ship, the *Herald*, lately brought home 71 lbs. of this substance that sold for $97 per lb.—*Scientific American.*

Nervous Headache.—Two drops of sulphuric ether on sugar, will frequently give ease in less than half an hour.

Destructive Explosion of Picrate of Potass in Paris.

An explosion of a most disastrous character occurred in Paris, on Tuesday, the 16th March, in the laboratory of M. Fontaine, manufacturing chemist, the successor of Messrs. Robiquet and Pelletier. It appears, from what is known on the subject, that a quantity, equal to about 56 lbs., of picrate of Potass was being packed for transmission to Toulon, to be used in charging marine torpedoes, when, from some unknown cause, an explosion took place which destroyed the premises, and caused also destruction of human life, instantly killing all those who were present, and who might have explained the particular circumstances of the case.

The explosive compound which occasioned this great calamity was a salt of picric acid, which has been frequently been used as a dye, imparting a yellow color to silk or wool without requiring any mordant or previous preparation of the fabric to be dyed.

It has long been known that the salts of picric acid are explosive, the acid itself being a compound having a similar constitution to gun-cotton, and being usually made by the action of nitric acid on carbolic acid. Some years ago a factory in Berlin was destroyed, and three men killed, by the explosion of 40 lbs. of picrate of soda. This salt is said to explode with four times the force of gunpowder

The application of salts of picric acid for the production of the implements of war appears to have been of recent date, and the terrific nature of the explosion which has now occurred in Paris fully justifies the opinion formed of their applicability for that purpose. It is stated that a few pounds of picrate of potash, enclosed in a torpedo, explodes with sufficient violence te destroy an iron-clad frigate. The order that was being executed by M. Fontaine was received from the Minister of Marine; and it is surprising that the Government, knowing the dangerous nature of the material, should have allowed such an order to be executed in Paris, where an accident could hardly fail to prove fatal to many persons. The victims on this occasion were M. Fontaine's son, M. Bal, a chemist, and two other persons employed in the establishment, but besides these, most of whom were literally blown to atoms, there were several other persons more or less seriously injured, and a great deal of property destroyed or damaged.

Metallic Uranium.

Metallic Uranium has lately been prepared in the pure condition by Peligot (*Comptes Rendus*, tome 67, p. 507).

One of the least-expected properties of this metal is its high specific gravity. In his earlier experiments Peligot obtained it in the form of powder; later he succeeded in producing it in small globules, fused at a high temperature. In this state it is white in color, somewhat ductile, though almost as hard as steel. By means of a file small fragments may be separated, which burn in the air with vivid lustre. At ordinary tempratures the metal, after a time, assumes a bronze color, sometimes the color of bluish steel.

The specimens exhibited in the Paris Exposition of 1867 were made by Mr. Valenciennes, according to the following process.

A mixture of 75 grammes of *protochloride of uranium*, 150 grammes of exsiccated *chloride of potassium*, and 50 grammes of *sodium*, cut into small pieces, are placed into a porcelain crucible, and covered with a stratum of chloride of potassium. The crucible is placed in a graphite pot or crucible, the space between the two being filled with perfectly dry powdered charcoal, after which the whole is heated in a draught furnace heated with charcoal. The reaction takes place regularly at red heat, after which the heat is immediately increased, to bring the metal to fuse without volatilizing any flux. In the black slag thus resulting, which is very dense, the metallic uranium is contained, and must be freed by washing.

In this process all influence of moisture must be avoided most carefully; even moist air, owing to its decomposing action on the protochloride, which becomes the oxide, in which state it is unfit for reduction to metal; besides, the metal while cooling must be carefully protected from air.

The density of this metal varies from 18·33 to 18·40; hence uranium is one of the very densest metals, remarkable in so far as its chemical properties place it in near relation to the earth metals.

Weight of the Brain.

At a meeting of the Vienna Society for Psychiatria and Forensic Psychology, prosector Dr. Meynert gave some statistics on the weight of the brain. His deductions from the weight of 351 brains, as well as those of Parchappe from 284, prove that the influen - of psychoses is much greater than age on the weight of this organ. For example, during the physiologically blooming age of the brain's weight (30—40 years in males), a mean of only 1,317 grammes was given, because brains of the later stages of psychoses were mingled with the others weighed; on the other hand, in the primary stage of psychoses, without regard to age, a mean of 1,329 grammes was given for conditions of depression and 1,359 for mania. Furthermore, the reduction of weight was always equal to the duration of the disease. It was also found to depend upon the intensity of the latter, as paralytic idiocy was characterized by a great reduction of weight. Meynert also found that insane brains had more cerebellum, proportionally, then sane; and that insane females had more than insane males.—*Medical Press and Circular.*

The Use of Zinc in the Reduction of Gold Ores.

M. D'Heureuse has been for some time experimenting in the use of zinc as a substitute for quicksilver in gold mining. According to the *Scientific Review*, he now finds that in the amalgamation process only ab ut half the gold is extracted from the rock. Melted zinc appears to take up all the gold, allows slag and rubbish to float at its surface, requires little heat to keep it melted, and from its volatile nature can be distilled in a retort to separate the gold and re-collect the zinc itself. The mode of operating is simply to introduce gradually the gold-bearing rock, in a pulverized state, into a bath of melted zinc. This metal immediately attacks and dissolves nearly every particle of gold, while the *debris* rise to the surface of the bath, and can be skimmed off. When sulphurets are present, the rock must be previously roasted. Surely nothing can be more economical and effective than this when plenty of zinc ore is at hand.

New Process for the Preparation of Phosphorus.

M. Aubertin communicates to the *Moniteur Scientifique* a process for the preparation of phosphorus, based on the fact that silica in presence of carbon displaces and reduces phosphoric acid combined with earthy bases, silicates of these bodies being formed. The author submits to the action of a strong furnace silica and fossil phosphate of lime, in such proportions that the silica shall preponderate over the lime, but yet not be in such excess that an infusible silicate be formed. To augment the fusibility of the silicate produced, a little alumina and magnesia may be added, if enough is not present, inasmuch as the silicates with several bases are more fusible than others; to effect this, clay is of great service. The escaping gases mixed with vapor of phosphorous may be condensed by any suitable contrivance, or be burned, and the immediate production of phosphoric acid be effected.

New Direct Vision Spectroscope.

At the soiree of the Royal Society, Mr. Browning exhibited a direct vision spectroscope, small enough to be carried in the pocket, yet so powerful, that it shows the D lines widely separated. The instrument contained ten prisms; four of these were of the great specific gravity 4·5. This is the densest glass that has been made for optical use in England. Although it contains a great quantity of lead, it seems to preserve a good surface. But in Mr. Browning's arrangement of the prisms, the oxidizable surfaces are so completely protected from the action of the atmosphere, that the spectroscope might be used in a chemical laboratary.

Measurement and Weights.

A well proportioned man,

Measuring 6 ft.	should weigh	...175 lbs.
" 5 " 11 in.,	"	...170 "
" 5 " 10 "	"	...165 "
" 5 " 9 "	"	...160 "
" 5 " 8 "	"	...155 "
" 5 " 7 "	"	...150 "
" 5 " 6 "	"	...145 "
" 5 " 5 "	"	...140 "
" 5 " 4 "	"	...135 "
" 5 " 3 "	"	...130 "
" 5 " 2 "	"	...125 "
" 5 " 1 "	"	...120 "
" 5 "		115 "

This table has been estimated from the measurement and weight of two thousand six hundred and fifty healthful persons (2,650). The averages (not the actual figures) are given, and the curious fact appears that for every inch in height above five up to 6 feet, a healthy person ought to weigh an additional five pounds.

In weighing, an allowance of one-seventeenth should be made for clothing; thus a person weighing 170 pounds should be put down at 160, when denuded.—*The Probe.*

Sugar from Pumpkins.

We condense the following from a Southern cotemporary for the benefit of our readers:

During late years, several more or less successful attempts have been made to introduce into the United States, sugar-producing plants to replace the cane. The beet root and sorghum are among the number, but one of the most valuable, which is cultivated in every cornfield in the Middle States as a side product, has been quite neglected. This plant is no other than the common pumpkin, the *Cucurbita pepo* of botanists. Its period of harvesting lasts longer than that of the beet, it is easier preserved and its refuse is just as valuable for the feeding of stock. Pumpkins weigh from 50 to 60 pounds; they furnish about 4 per cent of sugar, their contents in juice is 80 per cent. This juice indicates from 10 to 11 on Baumé's areometer.

The sugar obtained from pumpkins is of a good grain and color. Before refining, it has a slight flavor of melon. The sirup is of a very dark green color, nearly black, and taste like cane sugar.

In Hungary, since the year 1837, several manufactories for making sugar from pumpkins have been in operation. The treatment of this fruit is perfectly identical with that of the beet root, and the machinery used for the purpose the same.—*Scientific American.*

Neutral Carbonate of Ammonia.

It has been generally supposed that this salt could not be obtained in a solid form, but E. Divers has recently succeeded in preparing it by dissolving commercial sesquicarbonate of ammonia in aqua ammonia and ammoniacal gas; also, by passing ammoniacal gas through the solution of the commercial carbonate and cooling the mixture, the new salt will crystallize out. The simple carbonate of ammonia forms silky crystals, easily soluble in water, soluble in 70 volumes of alcohol, and very soluble in the air.

The mean of several analyses gave:—

Carbonic Acid	38·60
Ammonia	29·82
Water	31·58
	100·00

Corresponding to the formula NH^4O,CO^2+HO.—*Journal of Applied Chemistry.*

Syrup of Orgeat.

We have often been desired to give a formula for making a good syrup of orgeat, as the article commonly sold by druggists and others at the soda fountain is very inferior. We have recently seen a very fine syrup, and have been favored with the recipe for making it. Take of the kernels of sweet almonds 1 pound; of bitter almonds, 2 drachms; deprive them of the skin; beat them in a mortar to a paste, and add barley water, 1 qt.; strain and add white sugar, 3 lbs. orange flower water, one tablespoonful, and brandy, 1 half pint. The barley water is made by washing 2 ounces of barley to clear it of extraneous matter, then boiling it in half a pint of water for five minutes, rejecting the resulting liquid. It is then boiled in two quarts of water, until it is reduced to one quart, and strained.—*Jour. of Applied Chemistry.*

Preparation of Podophyllin.

The *Journal de Pharmacie d'Anvers* gives the following recipe for the preparation of podophyllin:—Boil the root of *podophyllum peltatum* with lime, and precipitate the lime from the filtered decoction with double sulphate of iron and zinc; evaporate the filtrate to a syrupy consistence, treat the latter with alcohol, and filter again; evaporate the alcoholic solution, and re-dissolve in boiling water. On cooling a deposit of podophyllin is obtained.—*Chemist and Druggist.*

FLUID CAVITIES IN MINERALS.—"Proc. Roy Soc," No. 109, contains an important paper by Messrs. Sorby and Butler, on fluid cavities in rubies, sapphires, diamonds, etc. A specimen of sapphire, of which they speak, exhibits a remarkable cavity, containing a fluid which appears to be liquid carbonic acid. They said of this fluid, "Though the expansion below 30° (Cent.) was very great, compared with that of any other known substances, except liquid carbonic acid and nitrous oxide, when the temperature rose above 30° (C.), it was so very extraordinary, that it was not until after having preformed the experiment over and over again that M. Sorby felt confidence in the results." They found the expansion 780 times as much as that of water would be, 69 times as much as air and permanent gases. Above 32° (C.) the fluid quite filled the cavity, so that its further expansion could not be asertained.

THE LAND LEECH, *Trochata subviridis.*—Some interesting correspondence has been published in "Land and Water," proving that the above leech is a native of this country, as Dr. Gray affirmed in 1850. Some specimens sent by a correspondent, were recently examined by Mr. Henry Lee, who identified them with the *Trochata subviridis* of Dubochet. He showed them to Dr. Baird and the Rev. W. Houghton, by whom the identification was confirmed. When Dr. Baird put some of them into strong spirits, the colour left them, and gave a fine green hue to the fluid. Mr. Houghton shows that Dubochet considered them entirely terrestrial, while Moquin Tandon asserts that he kept them alive in water for more than fifteen days. Mr. Houghton says that neither of the individuals sent to him seemed at all at home when placed in water.

PRESCRIBING IN CHEAP PERIODICALS.—A most dangerous practice prevails of publishing in some of the cheap literature of the day various receipts for the cure of minor ailments, and it is one that is certainly upon the increase. Many of the prescriptions so given are absurd, and even dangerous; and this is not to be wondered at if we consider that the writer is often very deficient in all real knowledge of medicine, and that he is assisted by the errors of the printer, to whom the symbols of quantities are so many hieroglyphics. Our attention has been called to the following prescription, for instance: "Syr. of poppies, one ounce and a half; syr. of squills, half an ounce; of tincture of digitalis, thirty drops; a teaspoonful to be given to a child frequently." We can quite imagine a fractious baby being dosed into the effectual quietness of death by such a mixture.—*Lancet.*

TO CLEAN VERY DIRTY BRASS.—Rub some bichromate of potass fine, pour over it about twice the bulk of sulphuric acid, and mix this with an equal quantity of water. The dirtiest brass is cleaned in a trice. Wash immediately in plenty of water, wipe it, and rub perfectly dry and polish with powdered rottenstone.

CONGESTIVE HEADACHE.—Characterized by pallor of the countenance, dull eyes, dilated pupils, cold extremities, soft and feeble pulse. Give the fluid extract of belladonna, twenty drops to four ounces of water; teaspoonful every two hours.—*University Journal.*

CHILBLAINS.—One of the best remedies, is the free application of the strong tincture of capsicum.

TOOTHACHE. A small piece of cotton wool, saturated with ammonia, and inserted into the cavity of a decayed and aching tooth, is said to afford instantaneous relief.

Notes and Queries.

T. C. asks regarding SYR. FERRI IODIDI:—"Is there any objection to pouring the iodide, without filtering, into the syrup, and allowing it to clarify by subsidence; it seems to me to keep better. I tried the addition of tartaric acid, but it caused the syrup to change color. I refer to syrup made with sugar."

We see no objection to the omission of filtration, except non-compliance with the officinal directions. You are doubtless aware that the quantity of iron specified is much larger than is required for combination with the iodine; 28 parts of iron suffice for 126 parts of iodine, while the proportion ordered in the P. B. is 1 to 2, so that by using the unfiltered iodide, you have a large excess of metallic iron present, which, you rightly surmise, tends to preserve the syrup unchanged. We should prefer to filter the solution, and immerse in the syrup a strip of bright iron. Regarding the latter part of your note, we refer you to a paper on the subject in our present issue.

X. Y. Z.—COLOGNE WATER.—The following form is said to have been given by one of the Farinas, and was published as genuine in a German paper, a few years ago:—

Benzoin		2 oz.
Ol. Lavander		4 "
" Rosemary		2 "
" Neroli.		
" Lemon	a. a.	10½ oz.
" Aurantii.		
" Limetta.		
" Bergamot	a. a.	21 oz.
Tinct. Flor. Geranii rosei.		q. s.
S. V. R.		9 gals.

Add the ingredients to the spirit in the above order, and macerate for two weeks.

Constant Reader.—STAINS ON GLASS.—These may be removed by applying a mixture of hydrofluoric acid 1 part; water 5 parts. The dilute acid should be applied by a tuft of cotton wool attached to the end of a stick; otherwise, the fingers might sustain injury. After the expiration of four or five minutes, wash well with water. Scratches in lenses, or spectacle glasses, may be rendered unobservable by this treatment.

WHOLESALE PRICES CURRENT.—MAY, 1869.

Drugs, Medicines, &c.	$ c.	$ c.
Acid, Acetic, fort	0 12 @	0 15
" Benzoic, pure	0 28	0 35
" Citric	0 85	0 90
" Muriatic	0 05	0 07
" Nitric	0 11½	0 15
" Oxalic do	0 26	0 32
" Sulphuric	0 04½	0 07
" Tartaric, pulv.	0 40	0 45
Ammon., carb. casks	0 17	0 19
" " jars	0 18	0 20
" Liquor, 880	0 18	0 25
" Muriate	0 12½	0 15
" Nitrate	0 45	0 60
Æther, Acetic	0 45	0 50
" Nitrous	0 22	0 25
" Sulphuric	0 48	0 55
Antim. Crude, pulv.	0 10	0 12
" Tart. "	0 50	0 60
Alcohol, 95%	1 67½	2 00
Arrowroot, Jamaica	0 21	0 22
" Bermuda	0 60	0 65
Alum	0 02½	0 03½
Balsam, Canada	0 32	0 40
" Copaiba	0 75	0 80
" Peru	2 90	3 00
" Tolu	1 20	1 40
Bark, Bayberry, pulv.	0 20	0 25
" Canella	0 17	0 20
" Peruvian, yel. pulv	0 40	0 45
" " red "	1 50	1 60
" Slippery Elm, g. b.	0 18	0 20
" " flour, pkt's	0 28	0 32
" Sassafras	0 15	0 18
Berries, Cubebs, ground	0 30	0 40
" Juniper	0 06	0 10
Beans, Tonquin	0 60	1 10
" Vanilla	6 50	7 50
Bismuth, Alb.	6 20	6 40
" Carb.	6 20	6 40
Camphor, Crude	0 46	0 50
" Refined	0 60	0 68
Cantharides	0 90	1 00
" Powdered	1 00	1 10
Charcoal, Animal	0 04	0 06
" Wood, pow'd.	0 12	0 15
Chiretta	0 55	0 65
Chloroform	1 40	1 50
Cochineal, S. G	0 90	1 15
" Black	1 30	1 75
Colocynth, Pulv.	0 50	0 80
Collodion	0 55	0 60
Elaterium oz.	4 50	5 00
Ergot	0 96	1 00
Extract, Belladonna	2 00	2 20
" Colocynth, Co.	1 25	1 75
" Gentian	0 50	0 60
" Hemlock, Ang.	1 12	1 25
" Henbane, "	2 40	2 60
" Jalap	5 00	5 50
" Mandrake	1 75	2 00
" Nux Vomic...oz	0 60	0 70
" Opium "	Variable.	
" Rhubarb	7 50	—
" Sarsap. Hon. Co'	1 00	1 20
" " Jam. Co'	3 25	3 70
" Taraxicum, Ang	0 70	0 80
Flowers, Arnica	0 26	0 35
" Chamomile	0 36	0 45
Gum, Aloes, Barb. extra	1 00	1 10
" " " good	0 50	0 55
" " Cape	0 15	0 20
" " " pow'd	0 25	0 30
" " Socot.	0 80	0 90
" " " pulv.	0 90	1 00
" Arabic, white	0 42	0 65
" " " pow'd	0 57	0 65
" " sorts	0 34	0 37
" " " pow'd	0 50	0 60
" " com. Gedda	0 13	0 16
" Assafœtida	0 32	0 40
" British or Dextrine	0 13	0 15
" Benzoin	0 48	0 55
" Catechu	0 15	0 20
" " pow'd	0 25	0 30
" Euphorb, pulv.	0 32	0 40
" Gamboge	1 40	1 60
" Guaiacum	0 32	0 50
" Myrrh	0 48	0 60
" Sang Dracon	0 60	0 70
" Scammony, pow'd	5 60	—
" " Virg. "	14 50	—
" Shellac, orange	0 31	0 35

Drugs, Medicines, &c. *Continued.*	$ c.	$ c.
Gum, Shellac, liver	0 24 @	0 28
" Storax	0 65	0 75
" Tragacanth, flake.	0 70	1 00
" " common	0 30	0 35
Galls	0 32	0 37
Gelatine, Cox's, 6d.	1 10	1 20
Glycerine, com.	0 35	0 40
" Vienna	0 40	0 45
" Price's	0 65	0 75
Honey, Canada, best	0 16	0 20
" Lower Canada	0 12½	0 13
Iron, Carb. Precip.	0 20	0 25
" " Sacchar.	0 40	0 45
" Citrate Ammon.	0 90	1 00
" " & Quinine oz.	0 43	0 48
" " & Strychnine "	0 17	0 25
" Sulphate, pure	0 08	0 10
Iodine, good	4 50	5 00
" Resublimed	5 60	6 00
Jalapin oz.	1 50	2 00
Kreosote	1 60	2 50
Leaves, Buchu	0 30	0 50
" Foxglove	0 25	0 30
" Henbane	0 35	0 40
" Senna, Alex.	0 30	0 60
" " E. I.	0 12½	0 20
" " Tinnevilly	0 20	0 30
" Uva Ursi	0 15	0 20
Lime, Carbolate brl.	5 50	-
" Chloride	0 04½	0 06
" Sulphate	0 08	0 12½
Lint, Taylor's best	1 12½	1 25
Lead, Acetate	0 14	0 17
Leptandrin oz.	0 65	-
Liq. Bismuthi	0 50	0 75
" Opii, Battley's	7 60	9 00
Lye, Concentrated	0 00	2 00
Liquorice, Solazzi	0 40	0 45
" Cassano	0 30	0 40
" Other brands	0 14	0 25
Liquorice, Refined	0 35 @	0 45
" " Hessin's doz	2 00	
Magnesia, Carb. 1 oz.	0 22	0 25
" " 4 "	0 17	0 20
" Calcined	0 65	0 75
" Citrate...gran.	0 40	0 50
Mercury	0 65	0 75
" Bichlor	0 70	0 80
" Biniodid oz.	0 25	0 35
" Chloride	0 90	1 00
" C. Chalk	0 45	0 60
" Nit. Oxyd	0 90	1 00
Morphia, Acet.	--	—
" Mur. } about	8 00	-
" Sulph.	—	-
Musk, Pure grain oz.	22 00	
" Canton	1 75	2 00
Oil, Almonds, sweet	0 48	0 55
" " bitter	14 00	15 00
" Aniseed	4 00	4 50
" Bergamot, super.	6 50	7 00
" Carraway	4 00	4 20
" Cassia	3 00	3 20
" Castor, E. I.	0 17	0 20
" " Crystal	0 22	0 25
" " Italian	0 26	0 28
" Citronella	1 65	2 00
" Cloves, Ang.	1 00	1 10
" Cod Liver	1 40	1 50
" Croton	2 50	3 00
" Geranium, pure, oz.	2 00	2 20
" Juniper Wood	0 90	1 00
" " Berries	6 00	7 00
" Lavand, Ang.	20 00	22 00
" " Exot.	1 40	1 60
" Lemon, super.	3 20	3 60
" " ord.	2 70	2 80
" Orange	3 00	3 20
" Origanum	0 65	0 75
" Peppermint, Ang.	16 00	17 00
" " Amer.	5 00	5 50
" Rose, virgin	7 75	8 00
" " good	5 00	5 50
" Sassafras	1 30	1 40
" Wintergreen	5 80	6 50
" Wormwood, pure	5 80	59
Ointment, blue	0 65	0 70
Opium, Turkey, about	12 50	—
" " pulv.	14 80	—
Orange Peel, opt.	0 65	0 75
" " good	0 12½	0 20
Pill, Blue, Mass	0 70	0 75

Drugs, Medicines, &c. *Continued.*	$ c.	$ c.
Potash, Bi-chrom.	0 15 @	0 20
" Bi-tart.	0 25	0 28
" Carbonate	0 16	0 20
" Chlorate	0 40	0 45
" Nitrate	8 50	9 00
Potassium, Bromide	1 75	2 00
" Cyanide	0 70	0 75
" Iodide	3 80	4 50
" Sulphuret	0 25	0 35
Pepsin, Boudault's oz.	1 65	1 80
" Houghton's, doz	8 00	9 00
" Morson's oz.	0 85	1 10
Phosphorus	0 75	0 85
Podophyllin	0 60	0 75
Quinine, Pelletier's	1 70	--
" Howard's	1 75	1 80
" " 100 oz. case	0 00	—
" " 25 oz. tin	0 00	—
Root, Colomba	0 14	0 20
" Curcuma, grd.	0 12½	0 17
" Dandelion	0 25	0 35
" Elecampane	0 14	0 17
" Gentian	0 08	0 12½
" " pulv.	0 15	0 20
" Hellebore, pulv.	0 20	0 25
" Ipecac "	2 40	2 60
" Jalap, Vera Cruz	1 55	2 —
" " Tampico	0 90	1 —
" Liquorice, select	0 13	0 17
" " pow'd	0 12½	0 16
" Mandrake, "	0 20	0 25
" Orris "	0 20	0 25
" Rhubarb, Turky	5 25	5 50
" " E. I., China	1 50	1 75
" " " pulv.	1 60	1 85
" " " " 2nd	1 30	1 50
" " French	0 75	—
" Sarsap., Hond.	0 45	0 50
" " Jam.	0 75	0 80
" Squills	0 10	0 15½
" Senega	0 40	0 50
" Spigelia	0 35	0 40
Sal., Epsom	3 00	4 00
" Rochelle	0 30	0 35
" Soda	0 02	0 03
Seed, Anise	0 16	0 30
" Canary	0 06½	0 07
" Cardamon	2 10	3 00
" Fenugreek, gr'd	0 10	0 15
" Hemp	0 06	0 07
" Mustard, white	0 14	0 16
Saffron, Amer.	1 25	1 50
" Spanish	14 00	16 00
Santonine	11 50	12 50
Sago	0 07½	0 09
Silver, Nitrate, cash	14 90	16 50
Soap, Castile, mottled	0 12½	0 14
Soda Ash	0 03	0 04
" Bicarb. Newcastle	4 00	5 00
" " Howard's	0 14	0 16
" Caustic	0 04½	0 05
Spirits Ammon., arom	0 25	0 35
Strychnine, Crystals	2 65	3 00
Sulphur, Precip.	0 10	0 12½
" Sublimed	0 4	0 05
" Roll	0 03	0 04½
Tamarinds	0 15	0 20
Tapioca	0 20	0 23
Veratria oz.	0 25	0 30
Vinegar, Wine, pure	0 55	0 60
Verdigris	0 35	0 40
" Pow'd	0 45	0 50
Wax, White, pure	0 85	0 90
Zinc, Chloride oz.	0 20	0 25
" Sulphate, pure	0 10	0 15
" " com.	0 06	0 10
DYESTUFFS.		
Annatto	0 40 @	0 60
Analine, Magenta, cryst.	Variable.	
" " liquid	2 50	—
Argols, ground	0 15	0 25
Blue Vitriol, pure	0 08	0 10
Camwood, pure	0 06½	0 09
Copperas, green	0 01½	0 02½
Cudbear	0 16	0 25
Fustic, Cuban	0 03	0 04
Indigo, Bengal	2 40	2 50
" Madras	1 15	1 20
" Extract	0 28	0 35
Japonica	0 05½	0 06½
Lacdye, pow'd	0 35	0 40
Logwood	0 02½	0 03

Dyestuffs—*Continued*	$ c.	$ c.
Logwood, Camp	0 02½ @	03½
" Extract	0 12	12½
" " 1lb bxs	0 14½	—
" " ½lb "	0 15½	—
Madder, best Dutch	0 17	0 18
" " French	0 00	0 00
Quercitron	0 04	0 05
Sumac	0 06½	0 08
Tin, Muriate	0 10½	0 12½
Redwood	0 05	0 06
SPICES.		
Allspice	0 08½ @	0 10
Cassia	0 41	0 45
Cloves	0 13	0 14
Cayenne	0 18	0 25
Ginger, E. I.	0 12	0 14
" Jam.	0 28	0 30
Mace	0 78	0 90
Mustard, com.	0 20	0 25
" D. S.	0 40	0 45
Nutmegs	0 45	0 75
Pepper, Black	0 11½	0 12½
" White	0 20	0 22
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
" Red	0 08	0 10
Green, Brunswick	0 07	0 10
" Chrome	0 20	0 25
" Paris	0 20	0 35
" Magnesia	0 20	0 25
Litharge	0 08	0 09
Pink, Rose	0 12½	0 15
Red Lead	0 07½	0 08
" Venetian	0 02½	0 02½
Sienna, B. & G.	0 10	0 15
Umber, "	0 07	0 10
Vermillion, English	0 90	1 00
" American	0 25	0 35
Whiting	0 85	1 25
White Lead, dry, gen.	0 07½	0 09
" " " No. 1	0 06½	0 08
" " " No. 2	0 05½	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 32	0 37½
Red, Venetian	0 07	0 10
Patent Dryers, 1lb tins	0 14½	0 16
Putty	0 03½	0 04½
Yellow Ochre	0 08	0 12
White Lead, gen. 25lb tins	2 35	—
" " No. 1	2 10	—
" " No. 2	1 90	—
" " No. 3	1 65	—
" " Com.	1 30	—
White Zinc, Snow	3 00	3 50
NAVAL STORES.		
Black Pitch	4 50 @	5 50
Rosin, Strained	3 75	4 50
" Clear, pale	6 50	10 00
Spirits Turpentine	0 65	0 70
Tar Wood	4 00	5 00
OILS.		
Cod	0 65 @	0 70
Lard, extra	1 25	—
" No. 1	1 12½	—
" No. 2	1 05	—
Linseed, Raw	0 76	0 82
" Boiled	0 81	0 87
Olive, Common	1 35	1 60
" Salad	1 85	2 30
" " Pints, cases	4 25	4 50
" " Quarts	3 60	3 75
Seal Oil, Pale	0 87½	0 90
" Straw	0 75	0 80
Sesame Salad	2 40	1 75
Sperm, genuine	2 40	—
Whale, refined	0 95	1 00