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Selected Papers.

On the Aniline or Coal-Tar Colours.

BY W. H. PERKIN, F.R.S.

Continued.

The first apparatus used in the manufacture of nitrobenzol, for the preparation of aniline for the mauve dye, consisted of a large cast-iron cylinder fitted with a stirrer and closed with a door, fastened by a cross-bar and screw. This cylinder was capable of holding between thirty and forty gallons. It was provided with two necks, one for the introduction of the benzol and sulphuric acid, which was supplied through a syphon tube; the other for the exit of nitrous fumes. This last was connected with an earthenware worm, to condense any benzol which might be volatilized by the heat of the reaction. The nitrate of sodium was always introduced into the cylinder before the door was fastened up and luted. Until the preparation of nitrobenzol was understood, there was a great amount of uncertainty in its manufacture, and several explosions occurred, but fortunately without causing any injury to the workmen attending the apparatus. These explosions originated generally from the liberation of too much nitric acid from the nitrate of sodium, by the sulphuric acid, before the formation of the nitrobenzol had begun, so that when it started, the chemical action set in with such energy that an explosion ensued. After a few of these unpleasant occurrences, however, sufficient experience was obtained to get the manufacture under control. Apparatus of a much more extensive character has since been substituted for the cylinders.

This apparatus consists of large cast-iron pots, about 4 feet 6 inches deep, and 4 feet 6 inches wide; they are arranged in rows, and provided with stirrers, worked from a shafting by means of bevel wheels. The covers of these vessels are also made of cast-iron, and are in two pieces, of unequal size, provided with a tall rim, and so arranged that cold water may be kept circulating over their surface; this assists in condensing the benzol, which would otherwise distil away by the heat of the reaction. Through the larger half of the cover the spindle of the stirrer passes, and on account of the difficulty of keeping a stuffing-box in order when using the powerful chemicals necessary in this manufacture, a kind of water-joint has been substituted. It is necessary that it should be deep and rather capacious, instead of filling this joint with water, which would absorb the nitrous fumes, and produce an acid solution which would soon destroy the apparatus, the joint is filled with nitrobenzol; a cast-iron tube passes through the lid to carry away nitrous fumes; this is also cooled so as to condense any benzol vapor which may have escaped the cooling action of the lid; small pipes are introduced through another opening for the purpose of supplying the necessary chemicals. Besides these there is a large opening in the smaller half of the lid, for the purpose of introducing any of the products, which may be added in large quantities at a time. At the bottoms of these large vessels are openings for running out the finished product.

The process of preparing nitrobenzol with a mixture of sulphuric acid and nitrate of sodium in place of nitric acid, may be carried on very well in this apparatus, provided sufficient sulphuric acid be employed to produce an acid sulphate of sodium, as this will be found quite fluid at the close of the operation, and can be freely run out at the small outlet. A mixture of strong nitric acid and sulphuric acid is now usually employed for the conversion of benzol into nitrobenzol. In working by this latter method the entire charge of benzol is first introduced through the large opening in the lid; this is then closed and the stirrer set moving; the nitric and sulphuric acids are then cautiously run in through the small pipes, care being taken not to add too much nitric acid, until the red fumes begin to appear. After all the charge of acids has been added, and the reaction has perfectly ceased, the product is drawn off. At first a mixture of sulphuric and nitric acids run out, and then the nitrobenzol, this is collected separately and purified, first by agitation with water, and then rendered perfectly neutral by means of a dilute solution of soda. Should it contain any unconverted benzol, this may be distilled off by means of steam. On the continent manufacturers do not appear to have succeeded well in manufacturing nitrobenzol; when it first became a commercial article, their difficulty appeared to have arisen from the fact that they experimented in earthenware vessels, which are both dangerous and unsuitable, and it was not until information was obtained from England, I believe, that they were able to produce this body at a moderate price.

We will now pass on to the processes for converting nitrobenzol into aniline. I have already mentioned that Zinin was the first who discovered that nitrobenzol could be converted into aniline, or, as he termed it, benzidam. His process consisted in treating an alcoholic solution of nitrobenzol with ammonia and sulphuretted hydrogen; but although the discovery of this process was one of great importance from many points of view, still it was very tedious. Bechamp, however, found that by employing a mixture of acetic acid and finely divided iron instead of ammonia and sulphuretted hydrogen, the nitrobenzol was very rapidly converted into aniline, and this process has been found the best yet proposed for manufacturing aniline in large quantities. Many other reagents have been suggested, as arsenite of sodium, powdered zinc, &c., but none of them have been found so advantageous as iron and acetic acid.

In carrying out Bechamp's process, cylinders like those used for nitrobenzol were originally employed. The cylinder was set in brickwork, and heated by means of a small furnace, iron borings were first introduced, and the door fixed in its place air-tight. One neck was connected to the upper extremity of the cast-iron worm by means of a pipe called an adapter; the second neck being fitted with a syphon-tube, for the introduction of the nitrobenzol and acetic acid. In working on the large scale it is necessary to add the nitrobenzol and acetic acid in small quantities at a time, otherwise the reaction is so violent as to almost burst the apparatus; by working carefully, however, there is no need to fear any difficulties, especially if the stirrer is well used. By the time all the charge has been introduced a quantity of fluid will have distilled over; this is returned into the cylinder and the fire lit, and the aniline distilled off.

The principal change which has taken place in this process consists in using high pressure or superheated steam for the distillation instead of fire, and working the apparatus by means of a steam-engine instead of by hand.

You will observe that the stirrer, which is worked by bevel wheels, has a hollow shaft or spindle, as seen in the section. This is ground to an elbow, connected to the steam main, and held down by a screw, so that when the steam is turned on, it passes through the hollow elbow down the shaft, and then blows out at the bottom among the products; and in this manner the aniline is volatilized, and pass with the steam through the neck, and is condensed by a worm. Aniline thus obtained is generally re-distilled, and sometimes with a little lime or caustic soda, for the purpose of decomposing a body called acetanilide, which is often produced in the manufacture of aniline, especially if the operation is conducted over a fire instead of with steam.

Commercial aniline generally appears of a pale sherry color; when chemically pure it is colorless, but if kept long it becomes quite brown. It possesses a peculiar odor which is slightly vinous when the aniline is pure. It burns with a smoky flame, but is not very inflammable, its boiling point is 182° C. One of its most characteristic reactions is its power of producing a blue or blue-violet coloration with chloride of lime, to which I shall again have occasion to refer. Aniline differs entirely from benzol, and nitrobenzol, being perfectly soluble in dilute acids. This is owing to its being an organic base, and forming compounds with acids. Thus with hydrochloric acid, it forms hydrochlorate of aniline; with sulphuric acid, sulphate of aliine, etc.

We will now, in a very rapid and general way, glance at the chemical changes which take place in connecting benzol with nitrobenzol and aniline.

Benzol, as I have already stated, is a hydrocarbon, *i. e.*, a body composed of hydrogen and carbon only; it is represented by $C^6 H^6$. This is treated with nitric acid, which contains HNO^3

The nitric acts upon the benzol and introduces its nitrogen and parts of its oxygen, at the same time removing hydrogen and forming water.

$$\underbrace{HNO^3}_{\text{Nitric acid.}} + \underbrace{C^6 H^6}_{\text{Benzol.}} = \underbrace{C^6 H^5 NO^2}_{\text{Nitrobenzol.}} + \underbrace{H^2 O}_{\text{Water.}}$$

Nitrobenzol, when treated with iron and acetic acid, is converted into aniline by the influence of hydrogen gas, in what is termed the nascent state, or the peculiar condition in which it is when liberated from a compound.

This hydrogen unites with the oxygen of nitrobenzol and removes it as water, and at the same time two atoms of hydrogen combined with the deoxygenated nitrobenzol, forming aniline.

$$\underbrace{C^6 H^5 NO^2}_{\text{Nitrobenzol.}} + H^6 = \underbrace{C^6 H^7 N}_{\text{Aniline.}} + \underbrace{2H^2O}$$

Having now seen the various operations which require to be performed for the production of aniline from coal-tar, we are prepared for the consderation of its colored derivatives. We will, therefore, commence at once with the first of the coal-tar colors, "the mauve dye." I have already given you the history of its discovery; I will now tell you how it is made.

First of all aniline and sulphuric acid, in proper proportions for the formation of sulphate of aniline, are mixed in a large vat with water, and boiled until perfectly dissolved. Bicromate of potassium is then dissolved in a second large vat. These two solutions, when cold, are mixed in a third and still larger vessel, and allowed to stand one or two days. In this way a large quantity of a fine black precipitate is formed; this is collected upon shallow filters, well washed with water, and then dried. When dry it is a most unpromising sooty-black powder, and contains various products besides the mauve; the most troublesome of these is a brown, resinous product, soluble in most of the solvents of the coloring matter itself.

At first this resinous substance was removed by digestion with coal-tar naptha previously to the extraction of the coloring matter, which was afterward effected with methylated spirits of wine, and the solution thus obtatned when distilled left the mauve a fusible bronze-colored mass.

When digesting the black precipitate with naphtha or strong spirits of wine, the operation had to be performed in closed vessels under pressure or in connection with a condensing arrangement, otherwise large quantities of these valuable solvents would have been lost and great difficulty was experienced in getting apparatus perfectly tight, on account of the "searching" character of these fluids. Substitutes had also to be found for the ordinary materials employed by engineers for making good man-hole joints, and a number of other matters which are apparently of but small importance, but it is remarkable the amount of difficulty and annoyance they caused. The method of extraction has, however, been materially improved upon by substituting dilute methylated spirits of wine for strong, as this weaker spirit dissolves only a small quantity of resinous matter but all the coloring matter, so that the digestion with the coal-tar naphtha is now found unnecessary.

The solution of the coloring matter in dilute spirit is placed in a still and the spirit distilled off, the coloring matter remaining behind in aqueous solution; this precipitated with caustic soda. It is afterward collected on a filter, washed with water, and drained until of a thick pasty consistence, and, if necessary, dried.

The solid mauve dissolves very freely in spirits of wine, forming an intensely colored solution; it is also soluble to a small extent in water, but the aqueous solution on cooling forms a kind of jelly.

The formation of a mauve or aniline purple by the action of bichromate of potassium upon sulphate of aniline is a process of oxidation, and since the publication of the original specification at the Patent Office a great number of patents have been taken out for the preparation of this coloring matter, in which the bichromate has been replaced by other oxidizing agents, as peroxide of lead, permanganate of potassium, peroxide of manganese, chloride of lime, ferrocyanid of potassium, chloride of copper, etc.; but I need not make any special remarks upon these various processes, as experience has shown that bichromate of potassium and a salt of aniline, the reagents first proposed, possessed advantages over all others, and are now nearly universally employed for the preparation of aniline purple. The next best process appears to be that of Dale and Caro, in which chloride of copper is employed.

The affinity of aniline purple for silk or wool is very remarkable; and, if I take some wool, and pass it through a solution of mauve, you will see how rapidly it absorbs it, even from a very dilute solution. Aniline purple is sent into the market in three different conditions—in paste, in solution, and in crystals; but the latter are very rarely employed, as they are very expensive, and do not offer corresponding advantages to the consumer.

The mauve is the most permanent coal-tar purple known especially in respect to its power of resisting the action of light.

I will now endeavor to give you some idea of the approximate amount of the various products, we have considered, obtainable from 100 lbs. of coal; and, for this purpose, I have arranged them in the following table, with their respective weights:—

	Lbs,	Ozs.
Coal	100	0
Coal-tar	10	12
Coal-tar naphtha.	0	$8\frac{1}{3}$
Benzol	0	$2\frac{3}{4}$
Nitrobenzol	0	$4\frac{1}{4}$
Aniline	0	$2\frac{1}{4}$
Mauve	0	$0\frac{1}{4}$

You see the smallness of the amount of coloring matter obtainable from coal to coal-tar; but there is fortunately one thing which to some extent compensates for this, and that is the wonderful intensity of this coloring-matter. I will illustrate this remarkable fact. I have here a large carboy, containing 9 gallons of water, and will now add to this a solution containing 1 grain of mauve, and illuminate the liquid with the magnesium-lamp; and you see the single grain has colored this large bulk of water. A gallon of water contains 70,000 grains; therefore 9 gallons contain 630,000 grains. This solution, then contains only 1 part of mauve to 630,000 of water.

I have now shown you the manifold operations which have to be performed before we can derive the mauve from coal-tar, and have also mentioned a few of the obstacles which had to be overcome before its manufacture on the large scale could be accomplished. We have thus laid the ground-work of our subject; and in our next lecture, I hope to tell you a little more about mauve, and then give an account of the many other coloring-matters of which it may be considered the parent.

Purification of Chloral Hydrate.*

BY DR. F. A. FLUCKIGER.

There is perhaps scarcely a liquid in which chloral hydrate is insoluble at ordinary temperatures; four parts of it dissolve gradually in one part of water, the solution crystallizes at 0° C., but not in well-formed crystals. Alcohoral and either dissolve it to such an extent that it likewise does not crystallize well on evaporating these solvents; absolute alcohol must be excluded, because it combines with chloral.

Chloroform and benzole are well adapted for recrystallization, but the first is too dear, and the last cannot be entirely removed from the crystals. The same holds good for oil of turpentine, from which beautiful tables and laminæ are obtained, if 1 p. chloral hydrate is dissolved in from five to six parts of the oil at from 30 to 40° C., and the solution allowed to cool slowly. Fat oils, which dissolve it readily, are evidently not adapted for this purpose. From petroleum ether, which at a moderate heat dissolves much chloral hydrate, it crystallizes well on cooling, but too rapidly to admit of large prisms being obtained; on a large scale, however, it may be of better service.

Uniformly satisfactory results were obtained with bisulphide of carbon. 45 parts of it dissolve at 15 to 18° C., but 1 p. chloral hydrate; it precipitates ethereal and alcoholic solutions of the latter. But at temperatures below the boiling of bisulphide of carbon, 4 to 5 p. of it are sufficient for dissolving 1 p. chloral hydrate. If allowed to cool slowly, beautiful crystals often an inch in length are obtained, easily collected, and readily freed from the last traces of the solvent by exposing them in thin layers to the air. Thus obtained, chloral hydrate possesses no acid reaction and does not attract moisture. The best prisms begin to fuse at 49° C., larger quantities at 53 to 54° C., the fused mass congrealing again at 34° or at 40° C. if a few crystals had remained unfused. Samples not well crystalized fuse at a lower temperature. The boiling point is 97·5° C. if the entire thermometer is surrounded by the vapors.

Bisulphide of carbon is cheap. Some loss is unvoidable; impurities in the mother-liquor increase gradually to such an extent that a rectification of the bisulphide over corrosive sublimate becomes necessary. With the last portions of the solvent a little chloral hydrate evaporates from the crystals, but the loss from the source is insignificant, $\frac{1}{2}$ grm. having lost but 3.3 per cent. in nine days. A draft of cold air, the addition of some petroleum ether, and the employment of the centrifugal machine will be of service when operating on a large scale. The price of chloral hydrate ought not to be raised in consequence of such purification.

*From Nues Jahr. f. Pharm., in Am. Jour Pharm.

Chloralum—A New Antiseptic.*

BY PROF. JOHN GAMGEE.

The hydrated chloride of aluminum is a salt, which, as preservative of organic compounds, I have made the subject of numerous experiments for some months past, and the more I work with it the more am I surprised that it has not been used in medicine. That, in common with other aluminous salts, it has the power of arresting decomposition, may not be altogether unknown; and what I claim as the result of my researches is, the recognition of its extraordinary value as an antiseptic—indeed, as a substitute for the very poisonous solutions of chloride of zinc—the caustic carbolic acid, which, from its smell, cannot serve for many purposes; chloride of lime, which evolves the most unpleasant fumes when used in water closets or elsewhere; the permanganates, which stain; and sulphurous acid, which cannot be conveniently used in hospitals or in the sick chamber.

*From the Chemist and Druggist.

Two obstacles have presented themselves to its prompt introduction into general use. The first is the source of supply, and the second the name.

Since the chloride of aluminum has never been a commercial article, and it was important to secure large quantities at a moderate price, half a ton was first made to determine the best method of production. Supplies can now be insured at a cost not exceeding that of the poisonous chloride of zinc, and below that of carbolic acid—indeed, so far below carbolic acid that it must supersede this where disinfectants are used in abundance—to water streets, closets, alleys, etc., which are now often redolent of the tar acid odor, that by no means finds favor in every household.

Secondly, as to the name. An antiseptic and disinfectant of such a character as this non-poisonous chloride, cannot be too widely used. That a long scientific name is an objection in a commercial point of view, and attended with great inconvenience, every one will admit. Carbolic acid is usually termed "carbonic" acid by the people, and every chemist is called upon daily to check popular blunders in naming articles asked for across the counter. I recently heard a respectable youth ask a dispensing clerk for "evorescing," and I was astonished to see a bottle of effervescing citrate of magnesia opened to supply the demand. I have consulted several medical friends and chemists as to the best popular name for the hydrated chloride of aluminum, and after many fruitless efforts, have determined on calling it "chloralum." I am aware of the objections to be raised to this, but since I searched for a single word whereby to designate it, one that would, in some sense, indicate the nature of the compound, and at the same time be quite new, I have resolved to adhere to a name which, like telegram, may become popular in spite of classical objectors.

All this matter of business may seem irrelevant; but only those who have happened to introduce some novelty are aware of the insurmountable barriers which present themselves in commerce.

And now, referring to the more pleasant part of my revelations—the results of experiments—it is not unimportant to state, that in January last I had to pay from 12s. to 24s. per pound for small quantities of the chloride to be found in the shops of manufacturing chemists in London. I did hear that the Messrs. Bell, of Newcastle, had supplied the anhydrous chloride to be mixed with size by Manchester cloth dressers; but, on application to this firm, I was told they had discontinued the manufacture of the metal, and, therefore, had none of the chloride. With the small quantities I could find, amounting in the whole to less than a couple of pounds, I made solutions of much greater strength than I have since found requisite, and immersed raw hide, meat, the feet of cattle cut off at the knee, rough fat, and other agents, for various periods, varying from a few minutes to twenty-four hours. The result was absolute preservation, and, what is more astonishing, after keeping these specimens up to the present time, I find no insects attacking them, as in the case of other means of preservation, even with arseniates.

Meat dipped in solution of 1·030 to 1·040 specific gravity, had a strong astringent flavor; but a retriever dog did not object to make a daily meal off flesh thus preserved, and thrived well on it. I knew from previous work that the chloride was non-poisonous; but I repeated my experiments to satisfy myself on the point, and then commenced preserving fish. I tried large quantities of plaice, soles, cod, whiting, mackerel, haddocks, mullet, and other kinds. Some were bought when far from fresh, and a dip purified them and arrested decomposition. A flabby cod, of suspicious appearance, became firm, and was good eating after a day's immersion. We had the least success with the mackerel and mullet, and, as a rule, none with the fish that had not been cleansed.

Mr. Frank Buckland aided me in procuring salmon from Thurso, Aberdeen, and Galway, dipped in the solution, when caught, and sent up to London without ice. All the fish arrived in good order, and kept several days. A sea trout was dipped in the solution in Aberdeen, exposed to 80° for thirty hours, and then sent up in a box. Mr. Buckland and Mr. Brudenell Carter tasted the fish, and coincided in the judgment termed of it in my household. The trout was firm and of excellent flavor, and, in both respects, contrasted favorably with salmon that had been transported in ice. The result of these experiments was, that the fish would bear immersion for five or six days. The scales softened, and the flavor was somewhat affected by longer immersions. Slices of fish were apt to discolor and lose their flavor in a much shorter time than whole fish; but a salmon split in two would dry slowly and prove good eating many days after being caught. As an aid in the drying of cod on the Newfoundland coast and elsewhere, a mild solution of the chloride would be invaluable, since thousands of tuns of fish have to be thrown away, when caught in abundance, because they can not be dried fast enough.

The chloride of aluminum is a deliquescent salt; but it has a tendency to part with its chlorine, and thus no obstacle is offered to the drying of the fish. These experiments show how safe an agent chloralum is, and every medical man can appreciate on the importance of having an inoffensive agent to be used in the sinks, dust-holes, and accumulations of filth and garbage in and around kitchens. A raid on the dust-holes and dust-pans is, probably, next in importance to the disposal and disinfection of sewage, and physicians have never had an antiseptic at their disposal which could safely be used in the dirtiest corners of most dwellings.

For ordinary disinfecting purposes, solutions varying from 1·006 to 1·010 specific gravity, are quite strong. Stronger solutions are usually unnecessary, and impart flavor to edible substances.

Any one who wishes to try a convincing experiment as to the value of chloralum, should drop some in strong sewage water. The solid matter is precipitated more rapidly than by the use of a persalt of iron, and the odor disappears. I am quite satisfied that it will aid those who are attempting to deal with the sewage of towns by combined mechanical and chemical means when irrigation is impracticable. It has one great virtue, which Dr. Budd, in a letter to myself, says must belong to "the antiseptic of the future," *viz.*: that it is quite harmless to vegetation. The chlorine combines with ammonia and other bases, and alumina is deposited with the solid organic elements. In the dead house, the dissecting room, museum laboratory, chloralum will be found invaluable.

It is most important to increase the number of agents available for sanitary purposes. The destruction of animal poisons, so much neglected a few years since, marks an epoch in medicial history which is in pleasant contrast to the days of long prescriptions and infallible cures. Cattle-plague times, fortunately, brought into fashion the stamping out of a malignant contagia, and, for this purpose, a good antiseptic, which cannot do harm, offend the most delicate nose, nor soil the finest linen, is a great desideratum.

I have striven to show, for years past, that we have a very distinct and destructive group of diseases in animals—the epizootics proper—propagated through time and space by contagion. Wherever these expizootics appear, antiseptics are of great value to destroy the virus as it is thrown off by the sick animals. All excreta should be disinfected, and all agents which are at all likely to be contaminated by the breath or discharges.

In the contagious pleuro-pneumonia I noted, some years since, that mild cases are controlled, and even cured, by astringent preparations, such as the sesquichloride of iron, and in the earliest stages of exudation, the internal use of chloralum would tend to limit the disease. It must be understood that I do not advocate treating cases of pleuro-pneumonia, except when special circumstances render it very desirable to do so. As a rule, the animals do best without medicine, but the early exudation occurs rapidly, much in the same way as hemorrhage and hemostatic properties of the chlorides of iron and aluminum render good service.

In the foot and mouth disease, which should never be permitted to reach our farms, a chloralum solution checks the discharge, destroys the virus, favors the cicatrization of ulcers and may be regarded as the best remedy to be used.

In conclusion, I wish to direct the attention of surgeons to the use of the hydrated chloride of aluminum in the treatment of wounds, erysipelas, gangrene, and various contagious inflammatory diseases of the superficial parts, such as the contagious ophthalmia of children, soldiers, etc. In fever wards, and every sick chamber, gargles and lotions containing it will frequently be found of use, and linen can be dipped in solution of it before removal from the sick chamber. It is a powerful styptic, and, in the treatment of chronic and acute discharges, hemorrhage, etc., it is of great value. It is sufficient to have drawn attention to this subject, to insure the multiplication of experiments; and the more the new compound is tried, the better will it be appreciated.

Poisonous Effects of Carbolic Acid.

The *Edinburgh Medical Journal* says. Professor Bardeleben found that when externally applied in surgical cases carbolic acid was absorbed, and acted poisonously in about 1 case in 10. This poisonous action was revealed, often, so early as the second day, by a peculiar effect on the urine which, pale at first, becomes gradually darker, on standing. No albumen, was present in the urine, but the patients lost appetite and strength. He recommends as a substitute the sulphocarbolate of zinc, first employed by Wood. Mr. Lister states that he has never observed the peculiar dark urine since the paste was replaced by lac plaster.

Dr. J. Wallace applied carbolic oil (1 to 8) to an abscess connected with morbus coxæ, in a child aged five. In about two months' time it was remarked that vomiting and dysphagia invariably followed each dressing, and on examining the urine he found it to possess a dark, smoky tint, very similar to the appearance of the urine in bad scarlatinal nephritis. Nitric acid added to the boiling urine threw down a heavy, dark precipitate. No trace of albumen. This deposit of pigment invariably appeared after each dressing with the carbolic acid, and disappeared again in a few days. A fortnight after the above symptoms were noted, he adopted Professor Lister's most recent method of carbolic dressings by oilskin, coated with dextrine and shell lac, and carbolic acid plaster; matters became more favorable, and the urine resumed its normal appearance. (*British Medical Journal*, April 30th). Dr. Lightfoot in the same journal reports a case in which alarming symptoms resembling those of pyæmic poisoning clearly resulted from the application of a weak aqueous carbolic lotion (1 to 50). The symptoms are developed three successive times when the lotion was employed and gradually subsided on its removal. Vomiting was dangerously severe, so that the patient's life was almost despaired of, but the urine was not darkened in colour. Numerous observers have recently met with cases of poisoning in connexion with the use of carbolic acid, and it is very necessary to observe caution as to the too free external use of this agent. The *black* or darkened urine, which is the most constant symptom, has been shown to occur in an equally marked form, whether tar or some colorless preparation of it be the agent employed. The exact cause of the coloration is still an open question, but it is at least probable, that the coloring matter is not derived from the blood. The constitutional disturbance is sometimes very grave, and seems to bear some connexion with different forms of solution of carbolic acid, the lac plaster appearing to be the safest, while a weak watery solution, freely used, apparently involves the most risk.

Manner of Applying Cements.

Quite as much depends upon the manner in which a cement is *applied* as upon the cement itself. The best cement that ever was compounded would prove entirely worthless if improperly applied. We have hundreds of receipts for glues, pastes, and cements of different kinds, and yet the public is constantly on the *qui vive* for new ones, and no more acceptable receipt can be sent to our popular journals than one for a new cement. Now, the truth is, that we have cements which answer every reasonable demand, when they are properly prepared and properly used. Good common glue will unite two pieces of wood so firmly that the fibres will part from each other rather than from the cementing material. Two pieces of glass can be so joined that they will part anywhere rather than on the line of union. Glass can be united to metal, or metal to metal, or stone to stone, and all so strongly that the joint will certainly not be the weakest part of the resulting mass. What are the rules to be observed in effecting this?

The first point that demands attention is to bring the cement itself into intimate contact with the surface to be united. If glue is employed, the surface should be made so warm that the melted glue will not be chilled before it has time to effect a thorough adhesion. The same is more eminently true in regard to cements that are used in a fused state, such as mixtures of resin, shellac, and similar materials. These matters will not adhere to any substance unless the latter has been heated to nearly or quite the fusing point of the cement used. This fact was quite familiar to those who used sealing-wax in old days. When the seal was used rapidly, so as to become heated, the sealing-wax stuck to it with a firmness that was annoying—so much so that the impression was in general destroyed—from the simple fact that the sealing-wax would rather part in its own substance than at the point of adhesion to the stamp. Sealing-wax is a very good agent for uniting metal to glass or stone, provided the masses to be united are made so hot as to fuse the cement; but, if the cement is applied to them while they are cold, it will not stick at all. The fact is well known to itinerant venders of cement for uniting earthenware. By heating two pieces of delf so that they will fuse shellac, they are able to smear them with a little of this gum, and join them so that they will rather break at any other part than along the line of union. But although people constantly see the operation performed, and buy liberally of the cement, it will be found in nine cases out of ten the cement proves worthless in the hands of the purchasers, simply because they do not know how to use it. They are afraid to heat a delicate glass or porcelain vessel to a sufficient degree, and they are apt to use too much of the material, and the result is a failure.

The great obstacles to the junction of any two surfaces are air and dirt. The former is universally present, the latter is due to accident or carelessness. All surfaces are covered with a thin adhering layer of air which it is difficult to remove, and which, although it may at first sight appear improbable, bears a relation to the outer surface of most bodies different from that maintained by the air of a few lines away. The reality of the existence of this adhering layer of air is well known to all who are familiar with electrotype manipulation. It is also seen in the case of highly polished metals, which may be immersed in water without becoming wet.

Unless this adhering layer of air is displaced, the cement cannot adhere to the surface to which it is applied, simply because it cannot come into contact with it. The most efficient agent in displacing this air is heat. Metals warmed to a point a little above 200° become instantly and completely wet when immersed in water. Hence, for cements that are used in a fused condition, heat is the most efficient means of bringing them in contact with the surfaces to which they are to be applied. In the case of glue, the adhesion is best obtained by moderate pressure and friction. Another very important point is to use as *little* cement as possible. When the surfaces are separated by a large mass of cement, we have to depend upon the strength of the cement itself, and not upon its adhesion to the surfaces which it is used to join; and, in general, cements are comparatively brittle.—*English Mechanic.*

Curcumine.

J. Kachler.—The author's researches on this subject were begun before those of M.M. Daube and Gajewsky, on this subject were published. As regards the contents of this paper, we learn, in the first place, that an aqueous decoction of the previously-ground root is a yellow-colored turbid liquid, which can only be obtained free from vegetable matter insoluble in water by being passed through a silk sieve. The decoction contains, in addition to the ordinary vegetable substances, a large quantity of acid oxalate of potassa. The residue of the root, having been dried, was first treated with sulphide of carbon, yielding to it about 8 per cent. of dark red-colored, fixed, fatty, very difficulty saponifiable oil, which, when treated with sodium amalgam, is decolorized so far as to become straw-yellow colored; it consists 7·98 per cent. of carbon and 9·6 per cent. of hydrogen, the remainder being oxygen. After having been treated with suphide of carbon, and dried, the residual matter of the turmeric was exhausted with concentrated alcohol, yielding to it a dark brown-red colored resin, which was found to be partly soluble in ether, and constituting what has been named curcumine. The author purified this resinous body, by dissolving it in dilute ammonia, precipitating that solution with chloride of calcium, collecting on a filter what was thrown down, and obtaining, by adding to the yellow-colored filtrate, some hydrochloric acid, a yellow flocculent substance, which, after having been thoroughly well washed, was dried *in vacuo* over sulphuric acid,, and constituted a chrome-yellow colored powder, which, on elementary analysis, yielded, in 100 parts—Carbon, 69·90; dydrogen, 5·70. The author's opinion is that this body may be simply chyrsophanic acid; and he tested this experimentally by distilling a small portion with pulverized zinc, obtaining thereby, as far as the tests executed upon a small quantity admitted of ascertaining it, a body identical with anthracen. Raw curcumine, as first obtained by the exhaustion of the turmeric with alcohol as above mentioned, was dissolved in warm and very dilute caustic potassa; the deep red-brown colored solution was boiled with sodium amalgam, and thus decolorized to a light yellow coloration. Access of air being sedulously avoided, the alkaline fluid was precipitated with acid, yielding a buff-colored, flocculent, resinous precipitate, *a*; the filtrate containing a substance, *b*, which was extracted from the liquor with ether. *a* is evidently a resin readily soluble in alcohol, but difficultly in ether, benzol, and sulphide of carbon; after having been dissolved in alcohol, and precipitated again with water, and dried, it was found, on elementary analysis, to contain in 100 parts—carbon, 73·77; hydrogen, 7·76. On being oxidized with fusing caustic potassa, it yields protocatechusic acid. As regards *b*, it was left, after evaporating of the ether, as a syrupy body, consisting chiefly of a weak acid which combined well with bases; but the author's researches in this direction are not complete, for want of sufficient material, and are to be resumed.—*Chemical News.*

The Supply of India-Rubber.—There are in America and Europe more than 150 manufactories of India-rubber, the consumption of which is more than 1,000,000 lbs. of gum per year.

THE CANADIAN

Pharmaceutical Journal.

E. B. SHUTTLEWORTH, EDITOR.

TORONTO, ONT., NOVEMBER, 1870.

OUR NATIONAL PHARMACOPŒIA.

Some few months ago we received a communication from a druggist in this province, requesting us to inform him in regard to the price of a work which, he understood, had been recently published, and which, under the general title of the *British Pharmacopœia* at once did away with the annoyance so often realized from the use of the different authorities representing the national colleges. Our correspondent stated that he "went in" strongly for progress, and that as he considered the publication of a work, like that indicated, was a step in the right direction, he intended to possess a Pharmacopœia himself, and that at once, so that he might be fully up to the times.

As it is now about six years since the *British Pharmacopœia* made its appearance in this country, we must confess to considerable surprise on reading the remarks of our progressive druggist. Visions of a pharmaceutic Rip Van Winkle, whose slumbers had been too profound to be disturbed by pharmacopœias, or pharmaceutical journals, flitted through our mind. These fancies were soon dispelled, for, on looking up our archives we soon discovered the fact that our correspondent was a venerable druggist, doing a flourishing business in a flourishing border town. It was at once apparent that his proximity to Uncle Sam's dominions had something to do with his ignorance of British enactments; and so it turned out to be. The *U. S. P.* was to him *the* authority the medicines which he was required to furnish were those sanctioned by that work, and by its formulæ his preparations were compounded; although it would appear that he still cherished a lively remembrance of the perplexities of "*London*," "*Edinburgh*" and "*Dublin.*"

Although we hope the case alluded to is a solitary one, as far as ignorance of the existence of a national authority is concerned, we are well convinced that when taken in a more general sense, the instance will not inaptly represent the state of things in many of our border towns, especially those in the western portion of this province. In some of these the British authority is disregarded alike by doctor and druggist, and preparations are made altogether by the U. S. P.; while in others both authorities are used, as the proclivities of the prescriber or dispenser may dictate. Even in the larger cities, in which are located our medical schools, the most disloyal and heterodox practices prevail. We venture to say that if a prescription requiring a quantity of *Tinct. Arnicæ* were to be sent to every retail druggist in this city, in nearly every case the United States preparation would be returned. This is not a solitary instance; we could cite many others, but as our readers probably understand the matter as well as ourselves, further illustration is unnecessary.

On one point there can be no difference of opinion—that some authority should be officially recognized and adhered to; we say *officially recognized*, for, though we have made use of the term "national standard" in referring to the British Pharmacopœia, we only do so by a kind of tacit acknowledgement of the authority, as we are not aware that any legislative enactment, or any decision of the Medical Council have ever been made in reference to the matter. The proposed Pharmacy Act contains a clause to the effect that all medicines shall be compounded according to the British standard, which virtually means, that where a medicine is designated in perscription by a general title, as *tinct. arnicæ*, that a preparation of another standard cannot be substituted for it. In case of such an enactment, our physicians will have to be a little more particular in their prescriptions in specifying the particular compound they require, or much disappointment must inevitably result.

We sometimes cherish a hope that we shall have a pharmacopœia of our own. The preparations of England do not seem to be generally acceptable in this semi-Americanized country, of *fluid extracts* and *concentrated remedies;* and though we entertain the most profound respect for the B. P.—especially the edition of 1864—we are inclined to think that the admixture of a little of the ready art of our pharmaceutical friends over the line would render the work more palatable to both physician and patient.

Montreal Chemists' Association.

The first meeting of the new Council of the Montreal Chemists' Association was held on Wednesday for the election of officers, when the following office-bearers were appointed for the coming year:—Benjamin Lyman, president; Nathan Mercer, 1st vice-president; Henry R. Gray, 2nd vice-president; Richard Britton, treasurer; Ebenezer Muir, secretary. The lectures for the coming season, which are to be on an extended scale, embracing practical chemistry and botany, &c., were under discussion, as also was the matter of legislation. We have since learned that a course of lectures on chemistry has been arranged under Dr. Girdwood, while Dr. Kollymer's lectures embrace materia medica, botany, and toxicology.

To Our Students.

We have been obliged to depart from the prescribed course in regard to the publication of the answers sent to questions. We find our space will not allow us to give them in full; and, moreover, most of the answers sent have not been altogether correct. We have, however, given a table of order of merit, in which the rating of each answer is represented by the number of marks credited. We intend to represent the matter at the next meeting of the Society, and hope to induce the Council to offer a prize or prizes each month for the best answers. This will be an inducement for our students to continue, and though we know that the knowledge gained in answering the questions is a full equivalent for the trouble and time expended, we think a little encouragement by the Society would add to the interest of the undertaking.

Too Good to be Lost.

The *Medical Times* contains the following:

"We copy the following paragraph, *verbatim et literatim*, from the London *Medical Press and Circular* for May 4, 1870:

"'The Boston *Medical and Surgical Journal* contains an article "On the Surgical Lessons of the Late War," by Dr. Asterisk, who praises very highly a preparation of the portentious name of ichthyocollae preparatæ Spaldingii. This remedy is recommended in cases of alopeciæ, of nervous prostration internally, as a dressing for wounds, etc. There seems to us to be far too many of such preparations in the American practice of medicine.'

"'Spalding's Prepared Glue' was made the subject, a year or two since, of a burlesque article, by well-known surgeon in the United States army. At the suggestion of a friend, he sent it to the journal named in the above quotation, in which, to his surprise, it appeared. We hope he will laugh as heartily as we have over the excellent ethics, but stupidity, bad grammar and bad spelling, of his British commentator."

MONTHLY MEETING.

The adjourned monthly meeting of the Ontario College of Pharmacy was held in the Mechanics' Institute, on Friday, November 11th, Mr. Brydon was called upon to preside.

Ordinary business having been disposed of, the following gentlemen were elected members:

J. H. Hewson.............Smithville.
Samuel Snell..............Orangeville.

ASSOCIATES.

J. McHaffie.................Hamilton.
Andrew Rutherford.......Hamilton.
F. H. Murdock............Perth

An informal conversation was held on the prospects of the Pharmacy Bill, but in the absence of the members of the Committee on Legislation, nothing new was elicited. The secretary was instructed to urge upon the committee the necessity of prompt action, so that the Bill may be brought before the Legislative Assembly at an early period of the coming session.

The chairman expressed his regret that no discussion had been appointed for the evening. He was not aware of any method which could be devised by which the interest of meetings could be so well sustained as that of the discussion of subjects in which all were personally interested. He then called the attention of those present to the ingenious and simple invention, used for the ready preparation of distilled water, and known as "Parrish's Pharmaceutical Still." He had one in operation in his own establishment, and was so pleased with its working that he could but recommend it to those who had not yet tried its merits. He then announced "*Tinct. Ferri Perchloridi*," as the subject for next evening's discussion.

Meeting adjourned.

H. J. Rose,
Secretary.

Students' Department.

Answers must be forwarded to the Editor before the fifth of each month. It will be preferable for students to employ the new system of atomic weights and formulæ as adopted in Fowne's *Manual of Chemistry*, or Roscoe's *Lessons in Elementary Chemistry*; but in case the student is not familiar with the more modern system, the older method may be resorted to. Weights and measures, except when otherwise expressed, are those of the British Pharmacopœia. Calculations need not be carried beyond the first place of decimals.

QUESTIONS.

I.—A vessel is capable of containing exactly one pound of *Æther.*, B. P.; how much officinal chloroform will it hold?

II.—How much commercial alcohol (65 o.p.) will be required to make 10 gallons of *spiritus rectificatus*, B.P.?

III.—What quantity of commercial hydrochloric acid (sp. gr. 1.15) corresponds to 10 parts of HCl?

IV.—Describe, by an equation, the chemical changes which take place in the preparation of *liquor potassæ*?

V.—What test would you apply in order to ascertain whether the reaction in the above process was complete?

VI.—Define the term equivalence, or atomicity?

VII.—Give tests for nitric, sulphuric, and hydrochloric acids?

VIII.—Describe a process for the assay of opium?

IX.—Describe the varieties of jalap occurring in commerce, and give the sources of each.

X.—Enumerate the principal substances incompatible with *tinct. ferri perchlor.*?

ANSWERS.

I.—A gallon of water of 231 cubic inches, apothecaries' or wine measure, weighs, at the standard temperature, 58328·8 grains, and contains 61440·0 apothecaries' minims; 200 cubic inches will, therefore, be equal to 53194 minims, or 6 pints, 14 oz. 6 dr. 34 minims, wine measure.

An imperial gallon of water of 277·27 cubic inches weighs 70000 grains, and contains 76800 imp. minims; 200 cubic inches will therefore be equal to 55397 minims, or 5 pints, 15 oz. 3 dr. 17 minims, imperial measure.

II.—Chloral hydrate, 2 grammes = 30.864 gr.
Water, 8 " = 123.456 "
Simple syrup 2½ " = 38.58 "

III.— NEW SYSTEM.

Sulphuric	acid,	H_2SO_4,	comb. weight	98
Hydrochloric	"	$H\,Cl$	"	36·5
Nitric	"	HNO_3	"	63

OLD SYSTEM.

Sulphuric	acid,	SO_3,	comb. weight	40
Hydrochloric	"	$H\,Cl$	"	36·5
Nitric	"	NO_5	"	54

IV.—(*a*) On adding a solution of chloride of sodium to that of nitrate of silver, a dense precipitate of chloride of silver is thrown down,

$$Ag\,NO_3 + Na\,Cl = Ag\,Cl + Na\,NO_3.$$

(*b*) The amount of chloride which may be obtained from one ounce (437.5 gr.) of the nitrate is 369.3 gr. 170 parts (the combining weight) of the nitrate is equal to 108 parts of silver, which, with the addition of 36·5 of chlorine, makes the weight of the chloride 143·5. If, then, 180 parts of nitrate yield 143·5 of chloride, how much may be obtained from 437·5 parts of nitrate? As 170·0 : 437·5 : : 143.5. *Ans.*, 369·3.

(*c*) Chloride of silver is soluble in a solution of common salt, consequently the precipitate would, ultimately, be dissolved.

V.—Ten ounces of perchloride of mercury require for decomposition, 12.2 oz. of iodide of potassium:—

$$HgCl_2 + 2KI = HgI_2 + 2KCl.$$

The combining weight of $HgCl_2 = 271$; that of $KI = 166·1$. But two atoms of iodine are required to form the biniodide of mercury; therefore, the weight of KI must be doubled = 332·2; then as 271 : 10 :: 332·2. *Ans.*, 12·2.

VI.—When solutions of carbonate of soda and sulphate of iron are mixed, a precipitate of carbonate of iron is produced, and sulphate of soda remains in solution:

$$Na_2CO_3 + FeSO_4 = FeCO_3 + Na_2SO_4.$$

VII.—Ten ounces of iron should yield 49·6 oz. of sulphate. One atom of iron = 56, requires one combining proportion of sulphuric acid = 98, and produces 278 parts of crystallized sulphate of iron, (the crystals contain 7 equivalents of water of crystallization which equal 126 parts.)

$$Fe + H_2SO_4 = (FeSO_4 + 7H_2O) + H_2.$$

VIII.—We are somewhat astonished at receiving such meagre answers as those forwarded, in regard to an enumeration of the different varieties of cinchona, and their respective alkaloidal strengths, as the excellent article on *Cinchona* in the U. S. D. which is, we are sure, within the reach of every student—contains ample data from which to compile a full and complete list. We advise students to give the question reconsideration, and compare the result of their examination with the table appended:

I. CINCHONA FLAVA—(Yellow Bark).

1. CINCHONA CALISAYA.

(*a*) *Flat Bark.*

AUTHORITY.	PERCENTAGE OF QUININE.
Soubeiran	1·74
Santen	1·75
Wittstock	2.30
Winckler	2·14
Michaelis	3·72
Riegel	2·78
Delondre	2·23
Average	2·38

(*b*) *Quilled Bark.*

Santon	0·77	Mean of five analyses.
Michaelis	2·01	
Dolondro	1·30	
Soubeiran	2·13	
Reichardt	0·60	
Average	1·38	

II. CINCHONA RUBRA—(Red Bark).

I. CINCHONA SUCCIRUBRA.

Santen	0·29	Mean of seven analyses.
Pelletier & Caventou	1·70	
Michaelis	0·83	
Duflos	2·34	
Henry	1·66	
Pfaff	0·30	Mean of many analyses.
Reichardt	0·95	
Average	1·12	

III. CINCHONA PALLIDA—(Pale Bark).

1. CINCHONA CONDAMINEA—(Loxa Bark).

Michaelis	0·10
Santen	0·70
Winckler	0·43
Bucholz	0·00
Howard	0·00
Average	0·24

2. CINCHONA NITIDA—(Lima Bark).
3. CINCHONA MICRANTHA—(Coarse, or Grey Lima).

Howard	0·24
Geiger	0.29
Von Santen	0·00
Delondre	0·15
Michaelis	0·39
Average	0·21

NON-OFFICINAL BARKS.

Of barks which are not officinal in the British or U. S. Pharmacopœias, the following classification may be made:

(*a*) Pitaya Bark (*Calisaya Pitayensis*)—

Delondre and	1·50
Bouchardat	1·86
Weightman	1·40
"	2·10
Average	1·71

(*b*) Bogota, or Fibrous Carthagena Bark (*Cinchona Lancifolia*)—

Karsten	1·55
Henry	1·55

(*c*) Carabaya Bark (*Cinchona Ovata* var. *Rufineris*)—

Delondre and	0·90
Bouchardat	1·34
Average	1.12

(*d*) Red Bark of Cusco (*C. Scrobiculata* var. *Delondriana*)—

U. S. P.	0·24

(*e*) Heavy Carthagena Bark, Santa Martha (*Cinchona Cordifolia*)—

Von Bergen	0·23

(*f*) Maracaibo Bark—

Delondre and	0·15
Bouchardat	0·22
Average	·18

(*g*) Jaen Bark (*Cinchona Ovata*)—

Geiger	0·05
Michælis	0·58
Howard	0·00
	0·00
Average	0·15

(*h*) Cusco, or Arica Bark (*Cinchona Pubescens*) Trace of quinia.

IX.—The subjoined answer to this question is given by W. A. C., Orono.

ACACIA—The most common varieties of this drug are the Turkey, Barbary, Senegal, Indian, Cape and Australian gum.

1.—TURKEY GUM—is obtained from *Acacia Arabica, Acacia Vera*, and probably other species of Acacia. It is procured chiefly from Egypt, Nubia, Kordofan and Darfur. We obtain it chiefly from Smyrna, Marseilles, or some other entrepot of the Mediterranean commerce. Two varieties are noticed one more or less coloured, the other white, in tears, and is the variety with which druggists are generally supplied, this is the best variety met with in commerce.

2.—BARBARY GUM—derived from *A. Vera* and *A. Gummifera*, is obtained from Barbary and Mogador, is very inferior, dark and mixed with impurities.

3.—SENEGAL GUM—is derived from *A. Vera* and *A. Senegal.* St. Lewis, at the mouth of the Senegal, and Portendic, export this variety. It is imported into the United States chiefly from Bordeaux, is consumed largely in France; is in large peices, yellowish or reddish.

4.—INDIAN GUM—is derived from *A. Arabica* and probably other species of Acacia; imported from the Indies, is very rough externally, with many impurities.

5.—CAPE GUM—imported from the Cape of Good Hope, collected probably from *A. Karroo* or *A. Horrida*; is of a pale yellowish colour, in tears or fragments, of an inferior quality.

6.—AUSTRALIAN GUM—imported from South Australia, is in peices, elongated or globular, rough and wrinkled upon the surface, of a violaceous tint.

X.—Opium in solution is incompatible with the alkalies and their carbonates; most metallic salts, as the acetate of lead, nitrate of silver, salts of copper, zinc, and iron; and with tannic and gallic acids, and astringent infusions.

ORDER OF MERIT.

Number of Marks awarded for Answers.

QUESTIONS—	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	Total.
1. *W. M. Rose*	0	10	7	10	10	10	10	6	8	10	81
2. *W. A. C.*, Orono	10	10	9	3	10	8	10	2	10	7	79
3. *Price Jackes*, Eglinton	5	10	8	10	5	10	10	2	8	8	76
4. *E. B. Borland*	9	10	3	7	5	8	0	2	6	10	60
5. *Oxygen*, Toronto	7	10	8	7	0	8	0	2	3	10	55
6. *J. J. Hall*, Woodstock	0	10	9	0	5	10	0	0	10	7	51
7. *J. S. Allan*	0	10	0	5	0	10	0	3	5	10	43

Notes and Queries.

MR. CARRE, of Meaford, writes:—"Did you ever use a tool, somewhat like a carpenter's chisel, for reducing stiff extracts and masses? The pestle and mortar are nowhere beside it; and with a stout pill-knife, having the round part of the end cut off square, and ground on both sides to an edge, you can thoroughly clean the slab, as well as blend the mass most effectually. I always cut my pill-knives so, and would now feel lost without them. This is a trivial matter, and yet I have met some who were not aware of the pleasure with which you can accomplish what is often a rather tedious operation without it."

J. S. Allan.—We have sent by mail the catalogues of medical and scientific works for which you enquire, and shall be happy to procure any books you may require.

E. S. P.—METALLIC ANTIMONY.—The ordinary black antimony of commerce, is a sulphide, and does not occur, in nature, in the form in which we usually see it, but is prepared from the native sulphide—a mineral found chiefly in Hungary, Saxony, Scotland, and at Cornwall, in England. The sulphide is separated from the matrix by fusion, and is cast into blocks of six or eight inches in height, by about half that width. It may be reduced to the metallic form by mixing eight parts of the powdered sulphide with six parts of cream of tartar, and three parts of nitre; and throwing the mixture in small portions into a red hot crucible. The heat must be maintained until perfect fusion. The yield will be about 70 per cent. of the sulphide employed. Metallic antimony fuses at 800 F.; it possesses a silvery lustre, and always exhibits evidence of crystalization. A metal for taking sharp impressions, such as you require, may be made by fusing together antimony 25 parts, lead 70 parts, and tin 5 parts. This is the usual composition of type founders' metal.

Assistant wants to know what studies he must pursue in order to qualify himself for his business. We have already treated this subject, at length, in previous numbers of the journal, but may now briefly say that as a basis, a thorough English education is necessary; the student should also possess some knowledge of Latin. The special branches of study are chemistry, materia medica, and botany. For chemistry, either Fownes or Roscoe, may be selected; materia medica—Pareira, Garrod, or Royle; botany—Gray or Bentley. A careful study of these works, and due attention to shop duties, if continued for a few years, cannot fail to make a good druggist.

Member—TESTING OF CHLOROFORM.—There is no test of the purity of chloroform which is more effectual, or more readiy applied, than that of pouring a small quantity—say half a drachm—upon a piece of clean filtering paper, and allowing it to evaporate; any deleterious impurities are readily recognized by the smell which remains. According to our experience—which we may say is based upon observations during the preparation of many thousands of pounds of chloroform—there is no test which affords, practically, more accurate results. If considerable quantities are at disposal; a half an ounce, or so, may be poured upon a clean plate; the slightest odorous impurity can then be easily recognized.

Philo asks: "Can any of your readers furnish me with a plan for making *mucilago acaciæ* that will not readily spoil? I have tried a formula which was published in the *Druggists' Circular* a short time ago, in which glycerine was the preservative, but I find that the preparation gets mouldy. Some of the essential oils make it keep well enough, but render it of no value for internal use. The quantity used by physicians here is so small that our stock often spoils before it is used up."

Changes.

Mr. Brumell, who for many years carried on the business of retail druggist, in King street east, Toronto, has been appointed sole agent for the well known English house of Messrs. Burgoyne, Burbidges & Co., of London. An advertisement of the establishment will be found in another column.

The business of the late Mr. W. McConnell, of Cobourg, is continued by his widow, and managed by Mr. Owen Lloyd.

The business carried on by Messrs. Fead & Brother, Stouffville, is now continued by W. Fead.

We regret to announce the destruction, by fire, of the establishment of a member of the Society, Mr. M. Wilson, of Madoc. The fire occurred on Monday, 7th, and was of the most destructive character, as one-half of the business part of the village was destroyed before its ravages could be stayed. We learn from a Belleville paper, that Mr. Wilson's stock was insured, in the Toronto Mutual for $800, an amount which will not cover the loss sustained.

PREPARATION OF CORALLINE FOR USE IN DYEING.

Editor Canadian Pharmaceutical Journal:

DEAR SIR,—Having seen some time ago, in the JOURNAL, a request for information as to the method of using coralline as a dye, I thought it might be interesting to some of your readers to hear of my success. After many experiments, which all resulted in disappointment, except that we could produce a very fine yellow, I at last got, from a circular, a hint which, after a few more trials, furnished me with the following valuable formula:

Dissolve 3 drachms coralline in 16 oz. alcohol; add 1 drachm liq. ammon. fort, or sufficient to give the solution a decided pink color; then add 3 drachms acetic acid, No. 7, or enough just to take off the pinkish appearance. A little of this solution, dropped into water, will dye silk or wool a beautiful scarlet. After once using, the dye-bath is not exhausted, but a second piece of goods may be put in and dyed. The solution of coralline must be used liberally, as it is not nearly so strong as magenta, consequently much more is needed. I enclose a piece of wool, dyed according to this formula, for your inspection.

Yours, &c., PHILO.

Address of the President of the British Pharmaceutical Conference.

THE English mail brings us details of the proceedings of the British Pharmaceutical Conference, which was held at Liverpool, during the latter week of September. We should like to reproduce, *in extenso*, the interesting report which appears in the *Chemist and Druggist*, and which embodies the introductory address of the President of the Conference, but a consideration of the amount of space at our disposal precludes anything but a passing notice of the proceedings. We cannot, however, forbear giving the following extract from the address referred to, which, as it furnishes a concise though comprehensive *resumé* of the progress of pharmaceutical science, during the last few years, cannot fail to be interesting to our readers.

"Our younger members will need no reminder from me, that great changes have within the last few years taken place in chemical philosophy. Chemistry now, more than ever, claims to be an exact science; and, although I fear many of us have bemoaned the change in notation and the attendant difficulty of unlearing an old system, yet the more simple explanation of puzzling organic metamorphoses will amply repay any trouble taken by the persevering student.

Nearly twenty years ago, our countryman, Professor Williamson, introduced to public notice the modern view of chemical types. Three years afterwards Gerhardt added to the Professor's water-type two others, the hydrochloric acid and ammonia.

From these views we have a more complete classification of the elements and their combinations than we ever had before. Ere many more years have elapsed, works on chemistry must be arranged on quite a different plan, especially with regard to the terms inorganic and organic.

In our older books the compounds included under these heads were supposed to be as distinct as if they belonged to the animal and mineral kingdoms. The term "organic" then denoted those compounds which were thought only producible in the bodies of plants and animals, and that their production was due to a supposed "vital force." Of course I here allude to organic and not *organized* bodies.

In later years many of these have been, and probably all will be formed by the chemical transformation of inorganic elements or molecules, as cases in point I would mention the artificial production of alcohol, sugar, acetic acid, etc. etc.

Perhaps the best definition of an organic substance is, that it is a carbon compound, and that carbon in chemistry is analogous to desmids and diatoms in microscopy. The latter seems to be debateable ground between the animal and vegetable kingdoms, as carbon is between inorganic and organic chemistry.

Oxalic acid was once considered to be only found in the juices of plants. Now it has been prepared from purely inorganic elements. By the decomposition of a piece of chalk we produce the well known gas carbonic anhydride, or carbonic acid. Then, by passing this gas over sodium and sand we have oxalic acid, identical in every respect with that found in the *Rumex* and *Oxalis*.

$$\underset{\text{Carbonic acid.}}{2CO_2} \times 2K = \underset{\text{Oxalate of Potassium.}}{K^2C_2O^4}$$

Our well-known alcohol is another instance of the artificial production from inorganic ingredients of what was formerly supposed to be formed only by the fermentation of starch or sugar.

By passing the vapour of that commonest of all minerals—sulphur—over the surface of red hot charcoal, we have carbon disulphide, the disagreeable liquid so often used for dissolving india-rubber. Then, again, if we mix this with hydro-sulphuric acid gas, and pass the mixture over red-hot copper, or with carbonic oxide over iron, we may, as proved by the experiments of M. Berthelot, produce olefiant gas, or, as it is now called, ethylene (C^2H_4).

$$\underset{\text{Carb. disulph.}}{2CS_2} + \underset{\text{Hydro- sulph. acid.}}{2H^2S} + 6Cu = \underset{\text{Ethylene.}}{C^2H^4} + \underset{\text{Cupric sulphide}}{3Cu_2S}.$$

Lastly, if we dissolve the ethylene in strong sulphuric acid, dilute with water and distil, we shall have as the result alcohol, similar in every way to that prepared by the distillation of grain.—

$$\underset{\text{Ethylene.}}{C_2H_4} + \underset{\text{Sulph. Acid.}}{H_2SO_4} + H_2O = \underset{\text{Alcohol.}}{C_2H_6O} + \underset{\text{Sulph. Acid.}}{H_2SO^4}$$

We might, in like manner, follow the synthetical formation of acetic acid from the same inorganic materials, carbon and sulphur.

The vegetable alkaloids, it is true, have not yet been artificially produced; but so great an advance is being made in the formation of organic compounds by artificial means, that I think it is not too chimerical an idea to expect a pharmaceutical solution of the philosopher's stone problem, and to manufacture quinia and morphia on the large scale. We should then be entirely independent of the *Cinchonaceæ* and *Papaveraceæ*, on which we now entirely rely for these invaluable medicines.

In the January number of the *Journal de Pharmacie et de Chimie* is an article by M.

Bourgoin on the electrolysis of the vegetable alkaloids,—an interesting subject that has not hitherto received the attention it deserves.

It has for some time been known that the salts of vegetable alkaloids, when subjected to galvanic action, obey the usual law of metallic bases and acids, for the alkaloid appears at the negative and the acid at the positive pole.

The author states that the sulphates of atropia, brucia, strychnia, codeia, and quinia, when acted upon by the galvanic current, behave exactly like ammonium sulphate—

$$NH_4SO_4 = \underset{+}{SO_4} + \underset{-}{NH_4}$$

But, more than this, he goes on to say, that when an acid solution of either alkaloid was used, and the conductibility of the liquid thereby rendered more perfect, the electrolytic action was much more violent. The solution became colored round the positive electrode, and evolved oxygen, carbonic acid and carbonic oxide gases.

The most remarkable result of the experiment was that, in each case, *the color produced was equal to that seen when the alkaloid was acted upon by strong nitric acid.* Thus, atropia and strychnia gave a yellow, brucia a blood-red, and codeia an orange color.

This effect was the result of true oxidation, and not from the formation of nitric acid.

The experiment appears to strengthen the idea of Liebig, that the nitrogenous alkaloids are substitution compounds containing amidogen, NH_2; in other words that they may be derivates of ammonia, NH_3, in which one atom of hydrogen has been displaced by an organic molecule.

Having alluded to botany and chemistry, allow me to take up a little more of your time by giving an illustration of the advantages of a knowledge of natural physics, because many of the most beautiful phenomena pass under the dispenser's notice every day.

At our last meeting I had the honor of alluding to some experiments, showing the practical application of spectrum analysis to several of our fluid preparations. By means of the spectroscope many elements have since then been detected in articles of the Materia Medica, which a few years ago were considered great rarities.

On the table are the ashes of many pharmacopœial substances which contain the metals, rubidium, lithium, and strontium.

Lithium has been noticed in creta preparata, potassæ tartras acida, radix taraxaci, radix rhei, *Gentiani lutea, Atropa Belladonna, Nicotiana Tabacum, Triticum vulgare,* commercial pearlash, raisins, carbo animalis, carragheen, and kaolin.

Strontium exists in many specimens of taraxacum, creta præparata, calamine, etc.

Rubidium has been detected in syrup made from loaf sugar, which most probably had been manufactured from Austrian beetroot, also in oak bark, from trees growing on beds of lias in the neighborhood of Bristol, and in tea, coffee, and cream of tartar.

Many samples of bismuthum album show the green line of thallium very distinctly, while oxide of zinc will sometimes indicate the presence of iridium.

By some authors it has been denied that plants absorb from the earth such metals as are not absolutely essential to their nutrition. Experiments, however, afford strong evidence to the contrary.

Mr. R. Warington (*Jour. Chem. Soc.* 1865) found in the ashes of the beech and birch ·193 per cent. of maganese. In a case of cattle poisoning at Wells Assizes, the animals were proved to have been killed by eating plants containing lead derived from the soil on which they grow. Analysis showed that grass, weeds, fungi, thistles and shrubs, contained a poisonous quantity of lead, although totally unaffected in their growth.

The triassic marls in Cotham, near Bristol, are celebrated for an abundance of celestine, or sulphate of strontium. An examination of the ashes of plants and shrubs growing on these strata nearly always shows the presence of strontium in small quantity. I have detected this metal in *Taraxacum, Arabi. Senecio, Capsella, Poa, Senebiera* and *Scoparium.*

In a communication to the Royal Society (*Proc. Roy. Soc.* 18,546) Mr. Higgins says he has found traces of lime in every specimen of magnesia he has examined, even in what was sold as pure magnesium oxide and magnesium chloride.

When magnesium oxide was examined, the heat of the oxyhydrogen flame was necessary to bring out the calcium lines distinctly. He noticed that it was always most satisfactory to employ a minumum quantity of oxygen, for when too much was used they were not so distinctly visible. Dr. Emerson Reynolds, whose experiments were recorded in the same paper, gives the same results.

But perhaps of all the phenomena observed in pharmaceutical optics, that termed fluorescence is the most striking and beautiful. It is the ghostlike appearance which we see every time we dispense a bottle of mixture containing quinine or syrup of red poppies. By very delicate methods of observation the singular fluorescent property may actually be seen on the white demy in which we wrap our bottles before sending them out.

It was formerly supposed to be occasioned by the reflection of light from an irregular surface, or from particles mechanically suspended in a solution, as when tincture of arnica is added to distilled water. In such mixtures the effect to the eye very much resembles fluorescence, yet is of a very different character, and may be distinguished by the rays of light being polarized, which is never the case with the true difusion of fluorescence.

The most convenient way of viewing these phenomena is by looking at the solution under examination through a prism, or by the actinic light of burning magnesium, or by passing the spark of an induction coil through a central vacuum tube.

Fluorescence may thus be observed in many substances of the Pharmacopœia, such as guaiacum, sulphate of quinine, *Hyoscyamus, Stramonium, Curcuma, Cannabis indica, Digitalis, Lobelia.* litmus, orchil, madder and *Papaver Rhœas.*

For some time the phenomena were explained by Sir J. Herschel, under the term epipolism, and afterwards by Sir D. Brewster as internal dispersion. It, however, remained for the President of the British Association, Professor Stokes, to discover the true explanation, viz. that the effects were caused by a change of refrangibility in the rays of light. The index of refraction is always *diminished,* because the length of the light wave is increased and the velocity lessened.

For instance, the invisible actinic rays which lay beyond the violet, are shown by quinine in the blue, by stramonium and curcuma in the yellow, and by chlorophyll in the red. In every case the change is towards the red end of the spectrum.

It sometimes happens that fluorescence is observed to commence in two parts of the spectrum, and would indicate that the solution under examination contains two distinct chemical compounds.

The bark of the horse-chestnut (*Æsculus Hippocastanum) is a remarkable example of* this. Its beautiful green fluorescence was formerly supposed to originate from crystalline substance called æsculin. A more accurate series of experiments by Mr. Stokes has shown that two parts of the spectrum were *simultaneously effected.*

This fact aroused the professor's suspicion, which a chemical analysis afterwards proved to be well grounded. Two glucosides were produced, viz. æsculin ($C_{21}H_{24}O_{13}$), which gives a sky-blue light, and paviin ($C_{27}H_{30}O_{13}$), which gives a bluish-green. When an aqueous mixture of both these principles is submitted to examination, a light is preceived in every particular identical with that from an original infusion of the original bark.

Thus it is that we often observe the different branches of natural philosophy dovetailing as it were into each other, and hastening to complete the chain of evidence required for elucidation of some interesting problem.

The past year has been prolific in so many new and important discoveries that it becomes difficult to point out one or two only for consideration.

At our last meeting Mr. Hanbury brought before our notice a new hypnotic, the chloral hydrate. Then it was an expensive curiosity, now it is in every one's pharmacy and manufactured in enormous quantities. The general impression is, that it will prove a very efficient remedy, especially where opiates are inadmissable. It is, however, much to be regretted, that already another *preparation has been introduced into the* market, which only contains 70 instead of 90 per cent. of chloral, and which is declared by Dr. Liebreich to be devoid of any therapeutic power. The chloral alcoholate, as it is called, is not so deliquescent as the hydrate, and *has a boiling point of 113·5° Cent.* and a sp. gr. of 1·34, while the true hydrate boils at 97° Cent., and has a sp. gr. of 1·57.

A very simple method of detecting the imposition by the use of ammonia, has been described by Mr. Umney.

Sulpho-carbolic acid is another preparation that has recently been brought into use. It is made by combining sulphuric and carbolic acids in their molecular weights (49 to 94) at a temperature of 290° F.

That true chemical union occurs is evident from the fact that sulpho-carbolic acid gives no precipitate with chloride of barium or nitrate of lead. It produces a characteristic purple colour with perchloride or pernitrate of iron.

Many physicians affirms that it is a more powerful disinfectant than plain carbolic acid. The salts most commonly used are the sulphocarbolates of soda and zinc.

Last year Mr. Hanbury alluded to the madder plant, a species of the *Rubiaceæ,* which, *although not in our Materia Medica,* yet is employed as a medicinal agent in manufacturing districts, and will, therefore, be my excuse for again alluding to it.

Its principal consumption, as you know, is for tinctorial purposes, and its value may be easily conceived when no less a sum than £1,000,000 is annually paid by us for foreign madder.

It owes its colouring matter to alizarine, which, singularly enough, does not exist in the living plant, but is produced by a kind of fermentation,

A few months ago two Germans succeeded in artificially making alizarine in quantity by the destructive distillation of coal-tar, like the well-known aniline dyes, alizarine being a product from anthracine as aniline is from benzol.

Montreal Chemists' Association.

The regular monthly meeting of this Association was held in their lecture-room on Thursday, Nov. 3rd, Nathan Mercer, Esq., in the chair.

After the reading of the minutes of the previous meeting, three young gentlemen were proposed and duly elected associate members of the Society.

The subject of the evening's lecture, namely, "The study of Chemistry and Materia Medica," by N. Mercer, Esq., was now introduced. On rising, Mr. Mercer said that his remarks would be directed specially to the junior members, a large number of whom he was pleased to see present. The lecture was one of very great interest and instruction, and showed conclusively that the Society has among its members those who are thoroughly qualified to teach the rising youth of the trade. When the lecturer sat down he was greeted with rounds of applause.

J. Kerry, Esq., now took the chair.

Dr. Edwards rose to move a vote of thanks to Mr. Mercer for his valuable lecture, seconded by Mr. R. Bolton, in a few appropriate remarks. This motion was carried unanimously.

Alfred Savage, Esq., addressed the meeting, and gave an amusing account of his examination before a Board of Physicians appointed as examiners, telling now nearly he been rejected, because he insisted that castor oil (being a fixed oil) was soluble in alcohol.

Before the meeting adjourned it was announced that the Winter Course of Lectures by the Professors would commence on Monday, the 7th inst.

Soluble Iodide of Starch.

According to M. Petit, iodide of starch prepared by the process described below is entirely soluble, of nearly constant composition, and always of a beautiful blue colour :—

Take
Iodine, 12 grammes.
Ordinary starch, 100 grammes.
Ether, q. s.

Dissolve the iodine in a sufficiency of ether, pour the solution on the starch, and triturate until the ether has completely evaporated. Transfer the powder to a porcelain capsule, and expose to a temperature of 212° over the water bath. In making considerable quantities it is necessary to stir the mixture. In the first part of this operation considerable quantities of iodine vapour are disengaged, but this soon ceases. The iodide of starch is exposed to heat for half an hour, during which space of time it acquires the property of being soluble in hot water.

From souble iodide of starch thus obtained, the syrup may be prepared by dissolving the former in hot water, and then adding a sufficient quantity of sugar. By employing

Iodide of starch, 25 grammes,
Water. 345 grammes,
Sugar, 635 grammes,

a syrup is obtained containing one gramme of iodine per kilogramme, and of which each spoonful of 20 grammes corresponds to 20 milligrammes of iodine.—*Chemist and Druggist.*

Detection of the Adulteration of Quinine with Salicine.

Dr. Solenón.—The author has comparatively tested the degree of accuracy and sensitiveness of the different tests in use for the detection of the presence of salicine in quinine, which, if made with the view of fraudulent adulteration, will always be at least at the rate of 1 per cent. of salicine, or more, because less will not pay. The author employed three kinds of sulphuric acid—viz., the fuming, pure concentraed acid, free from arsenic and nitric acid; ordinary concentrated suphuric acid of commerce, containing a trace of nitric acid; and, lastly, sulphuric acid to which, purposely, nitric acid had been added. A watch-glass having been placed on a sheet of white paper, and a drop or two of the acids above referred to (each in a separate glass) having been poured therein, a few crystals of the alkaloid (sulphate of quinine) were put on the acid; if pure, there is no coloration, but, even with 1-100th of salicine, the two first-named acids caused a dis. .ct red coloration, which did not ensue with the acid containing nitric acid. This latter acid was not even colored by pure salicine.—*Chemical News.*

Combination of Iron and Hydrogen.

The *Scientific American* is responsible for the following :—

Professor Jacobi, of Russia, has succeeded in depositing pure iron by means of the galvanic battery, and of manufacturing numerous articles out of it. But this supposed pure iron on being placed under the receiver of an air pump, and heated to redness disengages torrents of hydrogen, *increases* in volume, and changes into a silver white metal, very malleable and ductile, and so soft that it can be easily cut with sissors. Iron prepared in this way oxidizes rapidly in the air, and decomposes water below the boiling point. All deposits of iron by the battery are rich in hydrogen, and what is very remarkable, their volume is less than that of pure iron. This is just the opposite of what takes place when palladium is charged with hydrogen. It would appear from these facts that hydrogen combines directly with iron the same as carbon, and that hydrogen increases the hardness and density of iron, while it diminishes the malleability and oxidation.

Professor Jacobi has succeeded for the first time in making pure iron, and we can now study its properties. What was hitherto supposed to be pure metal was a compound.

Use of Mercury in Medicine.

Mercury appears to have been first used *internally* by Paracelsus, about the year 1520, although Theoduc, the Friar, in the twelfth century, describes the salivation that mercurial friction will produce. Calomel is first mentioned, although obscurely, by Oswald Crollins, in 1608; in the same year Bequin described it most fully and clearly. After this time chemistry took possession of the schools, and gradually the other preparations were discovered and introduced; and at this period there is no medicine in the pharmacopœia that enters into so many different receipts as that of mercury in its different combinations. In looking over "Griffith's Formulæ," we find no less than 192 different receipes with this mineral entering into and forming the active part of the prescription. We learn by this that it is a drug of powerful import in medicine, nor is there any remedy that has been more extolled and more abused than mercury.—*Med. and Surg. Reporter.*

The M'Boundou, or Icaja, a Poison in use at Gabon.

MM. Rabuton and Peyre report in the *Comptes Rendus* that, at Gabon, a French settlement on the west coast of Africa, there is in use a vegetable poison locally known as *m'boundou, or icaja.* That substance is the root of a plant which is not further specified. The authors have been experimenting with this substance, which, even in very dilute decoctions, is very bitter, and appears to contain one or more alkaloids, since the aqueous decoction is largely precipitated by iodide of potassium, and also by phospho-molybdic acid. The poisonous effects of this substance bear some similarity to the effects of brucia, but the authors state that, under certain conditions, this poison does not hurt men. Some of the lower animals are readily killed by it; a dose of three milligrms. of the alcoholic extract, placed under the skin of a frog, kills it; and rabbits and dogs are killed by doses of from 15 to 25 centigrms of the same extract introduced into the stomach.—*Phila. Med. and Surg. Rep.*

Prepared Coffee Leaves in Place of Tea.

Dr. Gardner (England) has made a curious discovery, viz.: That leaves of the Coffee plant may be substituted for those of tea without any considerable loss of the peculiar properties belonging to the latter. Dr. G., in examining at a grocer's shop a great variety of teas, noticed that one chest labelled "Assam Tea," had a very peculiar appearance. On his purchasing some, he found it to be prepared coffee leaves. These were in small fragments, not rolled, being too harsh for that operation, but convenient for measuring with a spoon, and yielding a strong, pleasant infusion, acceptable to many on account of its comparative cheapness. The dietetic question settled, the dishonesty of the transaction remains for punishment to prevent a customer from being imposed on, and buying coffee when he wants tea.—*Phila. Med. and Surg. Rep.*

Wines.

In an interesting paper in the *Practitioner*, on wines, the editor and staff arrive at the following conclusions :

Sound natural wines are to be obtained most economically from the Bordeaux districts, the red wines being the best.

Rhine wines (white) are equally good, but more expensive.

Hungarian and Greek wines are often very good, but unequal, from defects of manufacture, and too expensive.

The fortified wines (*i.e.* those to which alcohol is added during manufacture) develop no proper qualities till they have been some years in bottle. Sherry is, however, greatly superior to the other wines of this class, in the rapidity with which it develops the volatile ethers, upon which much of the value of wi es depends. Sherry is the appropriate st mulus of the enfeebled nervous system of *old age*, as well as of *certain kinds of* infantile and youthful debility. Children who are especia'ly benefitted by the habitual use of wine are—1. those in whom a tendency to wasting is very marked, *i.e.* those who, *without positively* seeming ill, are very apt to run down suddenly in flesh, with or without loss of appetite; 2. those who readily contract catarrhal affections, which are very slowly shaken off. The best way of administration is in combination with a simple bitter at a fixed time of day. Thus, a child three or four years old may take a teaspoonful of sherry, made up to a tablespoonful with infusion of gentian, three times a day.—*Medical Times.*

New Researches on Calisaya Bark from Java

J B. C. Moens.—The author communicates the esults of his researches of ten species of *Calisaya dubia*, and two of *Calisaya vera*. The freshly-cut bark contains 64 per cent. of water, and when when air-dried about 13 per cent. The quantity per cent. of all alkaloids together in the ten first-named species varies from 2·465 to 6·010. The quinine varies in quantity from 0·589 to 2·831 per cent. The cinchonidine (not met with in all the barks) is present in quantities from 0·539 to 2·41; the quantity of cinchonine varies from 1·405 to 3·909 per cent. The barks of *Calisaya vera* contained, respectively, 7·442 and 7.482 per cent. of alkaloids, the quinine amounted to 3·670 per cent., and the cinchonine to 2.812 per cent. The barks alluded to contain on an average, after having been dried at 125°, 2·332 per cent. of ash, of which 0·728 per cent. is lime.—*American Chemist.*

Science and Labor.

Dr. Lyon Playfair, M.P., the new president of the Midland Institute, Birmingham, in succession to the late Mr. Chas. Dickens, —to whose merits as a man of noble sympathies and beliefs, and an effective social reformer, he paid a feeling tribute—opened the session by an eloquent and thoughtful address on the union of science and labor. Ridiculing the idea that advances in science had been the result of accident, he pointed out that man's wants had led to the industrial arts, and the practice of these and long continued experiences gave birth to science. It was not promoted by a leisured aristocracy but, as a rule, by men rising from the industrial classes. Stephenson was a collier, Davy and Dalton druggists, Faraday a bookbinder, Harrison a carpenter, Watt a philosophical instrument maker, and Arkwright a barber. Even statesmen, such as Cobden, Bright and Gladstone, were being drawn from the same ranks. In a graphic sketch of the development of arts, Dr. Playfair showed how much science had contributed to their progress, and concluded by urging the vital necessity of education, that knowledge and labor might be joined. In a well-educated community, he observed, deaths by violence should be impossible, and yet in the last five years 82,853 persons perished by violence in England and Wales, and through disobedience to sanitary laws 110,000 were sacrificed every year.

Glycerine.

Dr. Hager is convinced that glycerine often determines, particularly in regions where the *skin is thin* and delicate, erythematous and other eruptions. Hagar found in glycerine which produced irritation, oxalic and formic acids, and in some specimens, ammonia. Besides these impurities, M. Schepky has verified, in glycerine reputed to be pure, the presence of nitric acid, fatty volatile acids, and alkalies; traces of chlorine, lime, and sulphuric acid sometimes exist in glycerine, which has not been distilled—(*Rev. de Thér. Med. Chir.*, No. 2, 1970.) M. Pérutz states that butyric acid can easily be detected by gently heating the glycerine with a little alcohol and strong sulphuric acid. If butyric acid be present, the pine-apple odor of butyric ether will be developed. According to Mr. J. Watts. the foreign or Vienna glycerine is apt to contain chloride of calcium, as much as one gr. in 3 oz. An old specimen of yellow glycerine in my possession, labelled "pure glycerine," gave a distinct precipitate with nitrate of silver, soluble in ammonia, and a slight cloudiness with oxalate of ammonium. —*Med. and Surg. Journal.*

Wax contained in Opium.

O. Hesse.—The author describes, at great length, the process by which, from the so-called *fæces opii*, may be obtained a waxy matter, which, on closer investigation, proved to consist of two different substances—viz., *cerotate of ceryl and palmitate of ceryl—the* latter forming the chief portion of the mass. The first-named substance fuses at 82°5; the last-named substance, $C_{32}H_{86}O_{2}$, fuses at 79°, is soluble in alcohol, chloroform, ether, and aceton, and crystallizes in prismatic-shaped crystals.—*Chemical News.*

Pharmaceutical Fun.

Fun gives the following interesting anecdote of Dr. B.—A P-istic apothecary (the late Dr. B.) re-O in secret at being den-oz-ed by a certain 5-atist as "as an un-9-ously poisonous old slop-seller.". Ever methodical in his habits, notwithstanding there were patients at least cwt-ing in his shop, the worthy apothecary went out into the street where, meeting his 5-atic reviler, he so congtly ex-lb-ed the rudiments of P-ism on the occiput and sinciput of his opponent as to compel him to R-rocate these hostile M-ations on his own be-ss. The 5-atist, however, getting q. s. of the worst of it, Co-ed the matter by renoz-ing his injurious opinion, and from that time they became fast friends.

We need only to explain that P stands for *pugil* (a pinch,) and M for maniple (a handful.)—*Chemist and Druggist.*

Trade Report.

Our remarks regarding the prosperous state of trade last month, are equally applicable to the present time. Business is still quite brisk, and all our wholesale dealers appear to be doing a lively trade.

The state of the market, as regards prices, is, however, by no means settled; fluctuations are both frequent and numerous. China goods are held much firmer, as an early advance is expected.

Amongst goods which have advanced in price we may note Cantharides, Mercury and its preparations, Iodide of Potassium, Canary Seed, Hemp Seed and Nutmegs.

Those articles which favor the purchasers are Alcohol—which is held at 10 cents lower than last quotations; Cochineal, Oil Cassia, Ipecac, Jalap, Indigo and Cassia; Sperm Oil is also considerably lower.

NAVAL STORES.—Rosin, Pitch and Tar are a little easier in price, but winter freights will probably keep them at the same figure for some time; Spirits Turpentine still continues to advance.

WHOLESALE PRICES CURRENT.—NOVEMBER, 1870.

Drugs, Medicines, &c.	$ c.	$ c.
Acid, Acetic, fort	0 12 @	0 14
" Benzoic, pure	0 25	0 35
" Citric	0 75	0 85
" Muriatic	0 05	0 07
" Nitric	0 11½	0 15
" Oxalic do.	0 24	0 30
" Sulphuric	0 03½	0 07
" Tartaric, pulv.	0 39	0 45
Ammon., carb. casks	0 18½	0 19
" " jars	0 18½	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 27	0 30
" Sulphuric	0 42	0 50
Antim. Crude, pulv	0 15	0 15
" Tart. "	0 46	0 55
Alcohol, 95% Cash	1 67	1 72
Arrowroot, Jamaica	0 25	0 22
" Bermuda	0 45	0 65
Alum	0 02½	0 03½
Balsam, Canada	0 24	0 35
" Copaiba	0 68	0 75
" Peru	3 80	4 00
" Tolu	1 10	1 30
Bark, Bayberry, pulv	0 20	0 25
" Canella, "	0 17	0 20
" Peruvian, yel. pulv	0 42	0 45
" " red "	1 50	1 60
" Slippery Elm, g. b.	0 18	0 20
" " flour, pkt's	0 28	0 32
" Sassafras	0 12	0 15
Berries, Cubebs, ground	0 25	0 33
" Juniper	0 06	0 10
Beans, Tonquin	0 60	1 10
" Vanilla	14 00	15 50
Bismuth, Alb.	4 80	5 00
" Carb.	4 80	5 00
Camphor, Crude	0 35	0 45
" Refined	0 45	0 55
Cantharides	1 75	1 80
" Powdered	1 85	1 90
Charcoal, Animal	0 04	0 06
" Wood, pow'd.	0 12	0 15
Chiretta	0 25	0 30
Chloroform	1 25	1 50
Cochineal, S. G.	0 80	0 90
" Black	1 00	1 20
Colocynth, Pulv.	0 80	0 90
Collodion	0 67	0 70
Elaterium oz.	4 50	5 00
Ergot	0 70	0 80
Extract, Belladonna	2 00	2 20
" Colocynth, Co.	1 25	1 75
" Gentian	0 50	0 60
" Hemlock, Ang.	1 12	1 25
" Henbane, "	3 75	4 00
" 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 25	0 35
" Chamomile	0 30	0 40
Gum, Aloes, Barb. extra	0 70	0 80
" " " good	0 42	0 50
" " Cape	0 15	0 20
" " " pow'd	0 25	0 30
" " Socot	0 50	0 75
" " " pulv.	0 90	1 00
" Arabic, white	0 60	0 65
" " " pow'd	57	0 65
" " sorts	34	0 37
" " " pow'd	0 50	0 60
" " com. Gedda	0 13	0 16
" Assafœtida	0 31	0 35
" 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	36	0 38

Drugs, Medicines, &c. Continued.	$ c.	$ c.
Gum, Shellac, liver	0 30 @	0 35
" Storax	0 65	0 75
" Tragacanth, flake	0 80	0 90
" " common	0 35	0 40
Galls	0 32	0 37
Gelatine, Cox's, 6d.	1 10	1 20
Glycerine, com.	0 28	0 30
" Vienna	0 30	0 40
" Price's	0 65	0 75
Honey, Canada, best	0 17	0 20
" Lower Canada	0 15	0 18
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 40	1 60
Kreosote	1 60	1 70
Leaves, Buchu	0 25	0 30
" 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 20	1 25
Lead, Acetate	0 14	0 17
Leptandrin oz.	0 75	—
Liq. Bismuthi	0 50	0 75
" Opii, Battley's	6 60	8 00
Lye, Concentrated	1 50	2 00
Liquorice, Solazzi	0 42	0 45
" Cassano	0 23	0 40
" Other brands	0 14	0 25
Liquorice, Refined	0 35 @	0 45
" " Hessin's doz	2 00	
Magnesia, Carb 1 oz.	0 20	0 25
" " 4 "	0 17	0 20
" Calcined	0 65	0 75
" Citrate gran.	0 37	0 50
Mercury	0 75	0 80
" Bichlor	0 75	0 80
" Biniodid oz.	0 25	0 35
" Chloride	1 00	1 10
" C. Chalk	0 50	0 60
" Nit. Oxyd	1 00	1 10
Morphia, Acet	5 70	—
" Mur	5 70	7 00
" Sulph.	5 90	—
Musk, Pure grain oz.	21 00	—
" Canton	1 00	1 20
Oil, Almonds, sweet	0 43	0 55
" " bitter	14 00	15 00
" Anniseed	3 60	4 50
" Bergamot, super.	5 70	6 50
" Carraway	4 00	4 20
" Cassia	1 90	2 20
" Castor, E. I.	0 14	0 15
" " Crystal	0 22	0 25
" " Italian	0 26	0 28
" Citronella	1 60	1 85
" Cloves, Ang.	1 00	1 10
" Cod Liver	1 40	1 50
" Croton	1 70	2 00
" Geranium, pure, oz.	2 00	2 20
" Juniper Wood	0 80	1 00
" " Berries	6 00	7 00
" Lavand, Ang.	19 20	20 00
" " Exot.	1 40	1 60
" Lemon, super.	3 30	3 60
" " ord.	2 60	2 80
" Orange	3 00	3 20
" Origanum	0 65	0 75
" Peppermint, Ang	15 00	17 00
" " Amer.	4 00	4 20
" Rose, virgin	7 75	8 00
" " good	4 40	5 50
" Sassafras	0 85	0 95
" Wintergreen	6 00	6 50
" Wormwood, pure	5 80	50
Ointment, blue	0 65	0 70
Opium, Turkey	8 50	9 00
" " pulv	10 30	11 00
Orange Peel, opt.	0 43	0 50
" " 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 38	0 40
" Nitrate	8 50	9 00
Potassium, Bromide	1 80	1 90
" Cyanide	0 65	0 75
" Iodide	4 00	4 50
" Sulphuret	0 25	0 35
Pepsin, Boudault's oz.	1 25	1 50
" Houghton's, doz	8 00	9 00
" Morson's oz.	0 85	1 10
Phosphorus	0 75	0 85
Podophyllin	0 50	0 60
Quinine, Pelletier's	1 90	1 95
" Howard's	1 90	1 95
" " 100 oz. case	0 00	—
" " 25 oz. tin	1 35	—
Root, Colomba	0 14	0 20
" Curcuma, grd	0 12½	0 17
" Dandelion	0 25	0 35
" Elecampane	0 14	0 17
" Gentian	0 10	0 12½
" " pulv.	0 15	0 20
" Hellebore, pulv	0 17	0 25
" Ipecaac "	2 00	2 20
" Jalap, Vera Cruz	1 35	1 60
" " Tampico	0 90	1 —
" Liquorice, select	0 13	0 17
" " pow'd	0 15	0 20
" Mandrake, "	0 20	0 25
" Orris "	0 20	0 25
" Rhubarb, Turky	4 00	4 50
" " E. I., China	1 25	2 00
" " " pulv.	1 40	2 50
" " " " 2nd	1 30	1 50
" " French	0 75	—
" Sarsap., Hond	0 45	0 50
" " Jam.	0 88	0 90
" Squills	0 10	0 15½
" Senega	0 97	1 00
" Spigelia	0 35	0 40
Sal., Epsom	2 50	3 00
" Rochelle	0 28	0 35
" Soda	0 01¾	0 03
Seed, Anise	0 16	0 30
" Canary	0 05¼	0 06
" Cardamon	4 30	5 75
" Fenugreek, gr'd	0 10	0 15
" Hemp	0 06	0 06½
" Mustard, white	0 14	0 16
Saffron, Amer.	3 00	3 50
" Spanish	18 50	19 00
Santonine	10 00	10 50
Sago	0 07½	0 09
Silver, Nitrate, cash	14 50	16 50
Soap, Castile, mottled	0 11½	0 14
Soda Ash	0 03	0 04
" Bicarb. Newcastle	3 75	4 00
" " Howard's	0 14	0 16
" Caustic	0 04	0 05
Spirits Ammon., arom	0 25	0 35
Strychnine, Crystals	2 30	2 75
Sulphur, Precip.	0 10	0 12½
" Sublimed	0 4	0 05
" Roll	0 03	0 04½
Tamarinds	0 15	0 20
Tapioca	0 15	0 18
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 90	0 95
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	4 75	—
" " liquid	2 00	—
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 02½	0 04
Indigo, Bengal	2 40	2 50
" Madras	1 00	1 10
" Extract	0 28	0 35
Japonica	0 05	0 06½
Laclye, pow'd	0 33	0 38
Logwood	0 02	0 03

Dyestuffs—Continued	$ c.	$ c.
Logwood, Camp	0 02 @	03½
" Extract	0 10½	0 14
" " 1lb bxs	0 14	—
" " ½lb "	0 15	—
Madder, best Dutch	0 15	0 18
" 2nd quality	0 14½	0 16
Quercitron	0 03	0 05
Sumac	0 06	0 08
Tin, Muriate	0 10½	0 12½
Redwood	0 05	0 06
Spices.		
Allspice	0 08½ @	0 10
Cassia	0 38	0 40
Cloves	0 12½	0 15
Cayenne	0 18	0 25
Ginger, E. I.	0 12	0 14
" Jam.	0 25	0 30
Mace	1 35	1 40
Mustard, com.	0 20	0 25
" D. S.	0 40	0 45
Nutmegs	0 76	0 80
Pepper, Black	0 14	0 15
" 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 03½
" Red	0 05½	0 10
Green, Brunswick	0 07	0 10
" Chrome	0 20	0 25
" Paris	0 30	0 35
" Magnesia	0 20	0 25
Litharge	0 08	0 09
Pink, Rose	0 12½	0 15
Red Lead	0 06½	0 08
" Venetian	0 02½	0 03½
Sienna, B. & G.	0 10	0 15
Umber, "	0 07	0 10
Vermillion, English	0 95	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 30	—
" " No. 1 "	2 10	—
" " No. 2 "	1 90	—
" " No. 3 "	1 65	—
" " Com. "	1 30	—
White Zinc, Snow	2 75	3 25
Naval Stores.		
Black Pitch	3 10 @	3 50
Rosin, Strained	3 10	3 75
" Clear, pale	5 75	10 00
Spirits Turpentine	0 56	0 60
Tar Wood	3 40	4 00
Oils.		
Cod	0 62 @	0 65
Lard, extra	1 45	—
" No. 1	1 12½	—
" No. 2	1 00	—
Linseed, Raw	0 75	0 80
" Boiled	0 80	0 85
Olive, Common	1 30	1 35
" Salad	1 80	2 30
" " Pints, cases	4 20	4 40
" " Quarts	3 60	3 00
Seal Oil, Pale	0 75	0 80
" " Straw	0 70	0 75
Sesame Salad	1 30	1 35
Sperm, genuine	1 90	2 00
Whale, refined	0 75	0 80