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Selected Papers.

On the Laws which Regulate the Division of a Body between two Solvents.*

BY MM. BERTHELOT AND JUNGFLEISCH.

It is frequently necessary to extract a body which has been dissolved in a liquid, by stirring into the latter another which does not combine with it, and whose action is, therefore, purely physical. Such means are frequently used for extraction, and even estimation, of bodies held in suspension in other liquids.

The action of the following bodies has been studied: Iodine and bromine, in the presence of water and of sulphide of carbon; succinic, malic, tartaric, oxalic, acetic, benzoic, sulphuric, and chlorhydric acids, in the presence of water and of ether.

All bodies capable of exercising chemical reaction were carefully excluded from our experiments; and the usual mode of operation was as follows: The body under treatment was dissolved in one liquid, a certain volume of another was then added; and the whole received a vigorous and prolonged stirring, the vessels being kept at one temperature by means of a water bath. The body in solution was estimated from time to time, until fixed results were obtained, which sometimes required one or two hours, and the amount was then estimated in each of the superincumbent liquids.

The Co-Efficient of Division.—A body simultaneously brought in contact with two solvents, in each of which it could be separately dissolved, never dissolves wholly in one to the exclusion of the other. Whatever may be the solubility of the body in question in one of these solvents, and whatever may be the excess of that solvent, the body is always divided between the two solvents.

Quantities dissolved by the same volume of two liquids remain in one constant relation between them. We will call this relation the co-efficient of division; it is independent of the relative volumes of the two solvents, but dependent on concentration and temperature. The following examples, cited from our numerous experiments, will be sufficient to establish this law:—

Succinic Acid, Water, and Ether at 15°.

	Final volume of the liquid.		Volume of baryta-water saturating 10c.c. of the liquid.		Co-efficient of division.
	Aqueous. c.c.	Ethereal. c.c.	Aqueous	Ethereal.	
Concentrated liquids.	70	30·0	42·44†	7·1	6·0
	49	49·0	43·8	7·4	6·0
	28	55·5	47·4	7·9	6·0
More dilute liquids.	30	70·0	18·8	3·4	5·5
	17	17·0	16·2‡	3·0	5·4

The co-efficient of division of a body between two solvents is analogous to the co-efficient of division of a gas between a liquid, which will dissolve it, and an empty superposing space; but, in the latter case, it is the tension of gas in the unit of volume of the empty space, which determines the quantity dissolved in the entire volume of liquid. In the case of a body divided between two solvents, it is the final quantity dissolved in the unit of volume of one of these liquids, which determines the quantity dissolved in the unit of the other.

Influence of Temperature.—The co-efficient of division changes with the temperature, but very slowly.

	Weight of succinic acid contained in 10 c. c. of the liquid.		Co-efficient of Division.
At 15°	0·376	0·060	6·2
" 0°	0·376	0·078	4·9
" 15°	0·106	0·019	5·5
" 0°	0·098	0·019	5·0

Influence of Concentration.—The co-efficient of division varies with the final concentration of the solvents, but not in proportion to the weights dissolved; its progress is slower.

Experiments with malic, tartaric, and acetic acids demonstrate that the co-efficient varies more rapidly with the concentration when very soluble bodies are under treatment, than with those which are less so. This difference is explicable because concentrated solutions of tartaric or acetic acid dissolve ether in proportion, differing from those effected by diluted solutions.

Sulphuric acid and chlorhydric acids give rise to a remarkable analogy, ether will dissolve them only when they are concentrated. The proportion of acid obtained from their aqueous solutions which are slightly diluted, is almost inappreciable.

*From Comptes Rendus in Chemical News.
†Equivalent to 0·158 gr. of succinic acid.
‡Equivalent to 0·122 gr. of succinic acid.

On a Species of Ipomœa, affording Tampico Jalap.*

BY DANIEL HANBURY, ESQ., F.R.S., F.L.S.
Honorary Member of the Chicago College of Pharmacy.

(TRANSMITTED BY THE AUTHOR.)

Two centuries and a half have elapsed since Jalap, the tubercule of a convolvulaceous plant of Mexico, was introduced into the Materia Medica of Europe. The botanical origin of the drug long remained unsettled, evidence of which exists in the fact that two plants, neither of which yields jalap, have in succession received, and still retain, the specific name *Jalapa*. The veritable source of jalap, however, was brought to light between the years 1827 and 1830, in which latter the plant was described by Wenderoth as *Convolvulus Purga*. In 1833, it was figured by Hayne under the name of *Ipomœa Purga*; but in 1839, it was transferred, on account of its tubular corolla and exsert stamens, to Choisy's genus *Exogonium*. As this genus has been recently united to *Ipomœa* by Dr. Meisner, it appears best to return to the name proposed by Hayne, and to call the true jalap plant *Ipomœa Purga*.

The unsettled condition of Mexico, and the fluctuations of commerce, have alternately depreciated or enhanced the value of jalap, and have led to the occasional importation of other roots possessing more or less of the characters of the true drug. Of such kinds of jalap, one of the most remarkable is a tubercule imported a few years ago for the first time from Tampico, and thence called *Tampico Jalap.*† This drug has been extensively brought into the market (that is to say, by hundreds of bales); and though it is less rich in resin and less purgative than true jalap, yet on account of its lower price, it has found a ready sale, chiefly in continental trade.

As the botanical origin of this so-called Tampico Jalap, and even its place of growth, were completely unknown, I addressed a letter, in November, 1867, to my friend Hugo Finck, Esq., Prussian Vice-Consul at Cordova (Mexico), begging that he would, if possible, procure for me some information on the subject. Mr. Finck at first expressed strong doubts as to Tampico Jalap being anything else than the root of *Batatas Jalapa*, Chois., known in Mexico as *Purga macho*. Upon inquiry, however, he ascertained that such could not be the case, but that it is a production of the State of Guanajuato, where it grows along the Sierra Gorda, in the neighborhood of San Luis de la Paz. At this town, and in the adjacent villages, it is purchased of the Indians and carried by the muleteers to Tampico, where it is known as *Purga de Sierra Gorda*.

All attempts to procure specimens of the plant were for some time fruitless, chiefly owing to the difficulty of finding any one in the district who could be induced to take the needful trouble. The perseverance of Mr. Finck, and his friend Mr. E. Benecke, Consul General for Prussia in the city of Mexico, overcame at length this obstacle, but only to meet with others hardly less embarrassing. The first lot of specimens despatched from Guanajuato was stolen from the mail; the second shared the same fate; while a third, which included live tubercules, was, by successive detentions on the way, fully five months in reaching England. The box, however, came to hand in June last (1869); and, amid a mass of damp earth and decaying matter, I had the satisfaction of discovering one solitary tubercule exhibiting signs of vitality. This, placed in a greenhouse and carefully nursed, soon began to grow with rapidity, and, on removal to an open border, produced a tall and vigorous plant, which towards September showed signs of flowering. It was then taken up and replaced in the greenhouse, where it blossomed freely in October last, but did not mature any seeds. Accompanying the tubercules, but of course in a separate box, my correspondent sent some pressed and dried specimens from Guanajuato, which correspond perfectly with the growing plant.

Having ascertained from the study of these materials, that the plant belonged to the genus *Ipomœa*, I endeavored to identify it with some species described in the "Prodromus" of De Candolle, or in the subsequently published "Annales" of Walpers, but without success. Neither was I able to find any corresponding specimen in the herbaria of the British Museum or of the Royal Gardens of Kew. In the Paris Museum there is a plant, collected by Galeotti on the lofty Cordillera, near Oaxaca, which, so far as a scanty specimen enables me to judge, accords precisely with that received from Mr. Finck. It bears a number which is not mentioned in the enumeration, by Martens, of Galeotti's *Convolvulaceæ* (contained in the "Bulletin de l'Académie Royale de Bruxelles"); and, I therefore conclude that it is unnamed. Under these circumstances, I have drawn up the following diagnosis and description of the plant, which I propose to call *Ipomœa simulans*. The specific name is chosen in allusion to the re-

*Extracted from the Linnean Society's Journal, and published in the Pharmacist, Chicago.
† I cannot, at least, trace this jalap to have been offered in commerce as a distinct sort earlier than about five or six years ago.

markable similarity which the plant bears in foliage and habit to the true jalap (*Ipomœa Purga*, Hayne), not to mention the resemblance of its tubercules. The funnel-shaped corolla and pendent flower-buds of the Tampico jalap-plant are quite unlike the corresponding parts of *I. Purga*, and furnish a ready means of distinguishing the two species:—

IPOMŒA SIMULANS, sp. nov. Radice tuberosâ, caule volubili herbaceo glabro, foliis ovatis, acuminatis, cordatis v. sagittatis, indivisis, pedunculis unifloris solitariis, sepalis parvis.

Hab. in Andibus Mexicanis *Sierra Gorda* dictis, prov. Guanajuato (fide cl. *Finck*); in regione frigidâ ad ped. 8,000 propé Oaxaca (*H. Galeotti*, no. 1369!).

Radix napiformis v. subglobosa v. elongata, carnosa, 2—3 poll. longa, basi fibrillosa *Caules* herbacei, graciles. *Folia* glaberrima 2—4 pollicaria, 1—2 poll. latâ, lobis baseos acutis v. rotundatis v. subtruncatis, petiolo tenui, 1¼—2¼ pollicari. *Pedunculi* axillares, petiolum subæquantes, penduli uniflori v. in plantâ vegetiore novelli alabrastra duo ferentes, altero semper (ut videtur) abortivo. *Pedicelli* incrassati, basi bracteis 2 minutis. *Sepala* ovata, obtusa, exteriora paullulum breviora. *Corolla* infundibuliformis, 1½—2 poll. longa, glabra, rosea, pallidé striata. *Stigma* bilobum. *Capsula* calycem superans, conica, 2 locularis, valvis 4 coriaceis. *Semina* glabra.

Bisulphite of Lime: its Manufacture and Uses.*

BY W. A. WETHERBEE, M.D.

This salt of lime has, within the past few years, come into extensive use for various purposes in the arts, and is often called and written, though improperly, as its chemical formula will show, "bisulphate of lime." Very few chemical text books make any mention of this substance, or the mode of preparing it, and, although several hundred tons are now annually employed in this country, yet we know of only one or two practical chemists who manufacture it in any considerable quantities. When sulphurous acid gas is passed into a mixture of lime and warm water, a combination is formed resulting in the sulphite of lime (CaO,SO^2, =66, with the usual addition of two equivalents of water), which is a white powder of slightly sulphurous taste, and soluble in about 800 times its weight of water at 60°. In an excess of sulphurous acid, it is readily soluble, forming the bisulphite of lime ($CaO, 2\ SO^2$, =92), which crystalizes in regular hexagonal prisms, difficult of solution, though more soluble in water than the sulphite, efflorescent, and by continual exposure to the air, absorbing oxygen and passing into the sulphate. In the employment of the sulphites, or bisulphites, it is therefore necessary that these salts should be kept fresh, and kept as much as possible from contact with the oxygen of the atmosphere. As sulphurous acid, upon which the properties of these compounds depend in their principal uses, is a very powerful deodorizing agent, the bisulphite is considered much more valuable than the sulphite for arresting the acetous fermentation of various substances. It is therefore employed in some very important practical applications. In pharmacy it is used for preventing rancidity in hair oils, lard, pomades, &c. One dram of the saturated solution added to a pound of any of the named articles will preserve them for many months from changes incident to exposure to the atmosphere. For hospital purposes it is now much employed for preserving beef tea, animal and vegetable jellies, &c., all of which are exceedingly apt to turn sour when exposed to the taints of a sick room or hospital. Infected clothing, when saturated with a solution of the salt and hung up in the air, becomes disinfected in a short time, leaving no disagreeable odor, as is the case when carbolic acids and many of the chlorides are employed. In the dissecting room, and in preserving specimens of anatomy and natural history, it is now extensively used in this and other countries, either with or without the addition of carbolic acid.

Within the past few years it has been sold and used to a very considerable extent for preventing the acetous fermentation of cider, wine, and malt liquors; and certain parties have endeavored to control the exclusive sale of it for this purpose, by means of a patent, but as we are informed, without success, as its use involves no new principle, and it had been applied to such uses some time before any claim had been made for its discovery or special application.

It affords a very convenient method for testing any liquid, such as washes for the hair, various cosmetics, &c., for the presence of lead, as the presence of any salt of the latter when added to the former, may be at once detected by the black color produced, which is the characteristic of the sulphuret of lead. One who is not a professional chemist, or has not the apparatus at hand for producing sulphuretted hydrogen, may use this without any other vessel or materials than those found in any household.

By beer and ale brewers a solution of the bisulphite of lime is now employed for rinsing out and cleasing beer or ale barrels which have been used and have become musty or sour. It was formerly the practice to burn a quantity of sulphur in the barrels, or to convey the fumes of burning sulphur within the barrel; but the use of this solution is attended with much less trouble and expense.

But its most extensive use has, for the last few years, been in the manufacture of sugar, as an antiferment, for the purpose of arresting and preventing the acetous fermentation of saccharine juices or solutions from which sugar is made. We think it was first used in the manufacture of beet sugar, but it is now used very extensively in the Southern States and West India Islands, where sugar is made from the juice of the cane. The largest manufactory in this country, if not in the world, is in Louisiana, supplying all the sugar refineries and manufactories of the South and West Indies, besides filling large orders from other countries. We have recently learned that certain parties are desirous of contracting for 4,000 tons for exportation, to be delivered within one year from date of contract.

We have not visited any laboratory where it is prepared on a large scale, but no doubt Calvert's method is usually employed, as being the best and most economical. A sulphur oven is constructed very similar to that used in the preparation of sulphuric acid. In this the sulphur is burned, producing sulphurous acid gas, which is conducted through an earthenware tube to a tall column constructed of wood or baked clay, and filled with hydrate of lime. The sulphurous acid is given off from the burning sulphur, mixed with atmospheric air and nitrogen gas, the latter of which results from the abstraction of the oxygen from the air to support the combustion of the sulphur, leaving the nitrogen as a residue. Of these combined gases, the lime absorbs only the sulphurous acid, and the others pass out into the atmosphere. The first product is the sulphite, but by continuing the process, another equivalent of acid is absorbed forming the bisulphite.

Free sulphurous acid is easily detected, even in small quantities, by its suffocating odor, like that experienced in burning lucifer matches. It gives no reaction with any of the salts of baryta, unless it is combined with a base. The reason of this is that the sulphate of baryta is insoluble, while the sulphite is soluble in free acid. Sulphuric acid in contact with any one of the salts of baryta combines with the base, and sets the other acid free, which cannot in turn exert any action on the sulphate. But, on the other hand, when sulphurous acid is added to a salt of baryta, the acid which combined to form this salt is set free, in which the sulphite of baryta is soluble. But in adding a sulphite to a salt of baryta no such solution occurs, as no acid is set free by which to dissolve the salt.

After bisulphite of lime has been exposed for some time to the atmosphere it is oxidized and a portion of it becomes sulphite of lime. The presence of sulphate may easily be determined by adding solution of the chloride of barium, which will produce a precipitate of sulphate of baryta, or the sulphite combined with the sulphate if the lime salt had been partially converted into its sulphate by oxidation. Then, by adding hydrochloric acid, the sulphite is entirely dissolved, while the sulphate remains a persistent precipitate. Of course the percentage of each may be determined by weight.

To test wines, malt liquors, &c., for the the presence of any sulphite or bisulphite, it is first to be acidulated with hydrochloric acid to a degree sufficient to act upon the metals in producing hydrogen gas. If then a few small pieces of metallic zinc be added, the gas produced will be sulphuretted hydrogen, which may be detected by the peculiar odor, like that of putrid eggs, or by exposing to it a piece of paper which has been dipped in a solution of acetate, or any of the soluble salts of lead. If the gas be sulphuretted hydrogen the paper will become blackened, but if pure hydrogen, no effect will be produced. If the substance to be tested be a solid, it must first be dissolved in hydrochloric acid, and then proceeded with as in the first instance. The bisulphite of lime is now in general use for beet sugar, and does not injure the quality of the root as food for cattle.

Although the salt is extensively used for cane sugar, it has been found in some instances to diminish the quantity of good, well-grained sugar. In such cases, however, the bisulphite was probably injudiciously used by those who were not thoroughly informed of its properties.

* From the Journal of Applied Chemistry.

The Elements of Cryolite and their Applications.*

BY PROF. CHARLES P. WILLIAMS.

Near the settlement of Ivigtut, in West Greenland, in the high northern latitude of 61°, occurs the only workable deposit of cryolite of which we have at present any knowledge. Picturesque and somewhat lofty mountains whose bases are washed by the waters of the little bay upon which the small village is situated, are composed of granitic and gneissoid rocks, in whose bosom is entombed a remarkable vein, or rather deposit of the nearly pure mineral, which attains an average thickness of not less than eighty feet, and which appears to be coincident in direction with the general course or strike of the beds of gneissic rock. This occurrence of the mineral cryolite is wrought under the auspices of the Danish Government by an incorporated company, and supplies manufacturing establishments in England, France, Denmark and the United States, with a raw material upon which is based several important and rapidly extending industries.

The mineral occurs at this locality associated with several species, among which may be enumerated spathic iron (ferrous carbonate), galena (sulphide of lead), and copper pyrites (sulphides of iron and copper), though none of these have been found in quantities sufficient to render them of importance. In addition to these are two or three minerals of interest only to the collector, and which are of quite recent discovery. They are related to cryolite, and are probably the result of a secondary action on the main mineral.

On chemical analysis, cryolite is shown to be composed of the three elements, fluorine, aluminium and sodium, combined in the proportion of six atoms of the first or two of the second and three of the third, so arranged among themselves as to produce one equivalent of fluoride of aluminium and three equivalents of the fluoride of sodium, giving rise to the formula, $3\ Na\ Fl + Al_2\ Fl_3$. Its percentage composition, as deduced from this expression, is as follows: Fluorine (Fl), 54; Aluminium (Al), 13; Sodium (Na), 23. Each of these elements, as extracted from the cryolite, finds important applications in the arts.

And first of fluorine: In its elementary condition we know little, if any thing, of this substance. Its isolation has been attended with so many difficulties, that the labors of but few, if of any, of the many chemists who have undertaken it have been crowned with success. But two of its compounds—one with hydrogen and the other with silicium, called respectively fluo-hydric and fluo-silicic acids—have recently had their technical employment considerably extended, thanks to the labors of M. Tessie de Motay and others, and their production on an industrial scale formed, according to the report of our Commissioner, "a somewhat prominent feature of the development of the chemical arts, as brought by the Exposition of 1867." De Motay prepares them by mixing fluor spar (fluoride of calcium), silica and alumnina in such proportions as to form a slag similar to that produced in a blast furnace; forms this mixture into a stiff paste, which is moulded into the form of bricks, and then dried in an oven. These are thrown, with the addition of a sufficient quantity of coke, into a blast furnace of from thirty to forty feet in height, where, as they descend, they are decomposed into fluoride of silicon and silicates of lime and alumina—the two latter uniting in the production of a slag, the first passing off as a gas. Above the mouth of the furnace is arranged a series of five condensing chambers, constructed of wood, into which the gaseous fluoride of silicon is conducted, and where it is decomposed, by passage over Venetian glass plates moistened with water, into gelatinous silica and a solution of fluo-silicic acid.

This acid has, for some time, been used for liberating chloric acid from chlorate of potash, in order that it may be combined with other bases and be employed in pyrotechny. A recent application of it is for the production of the insoluble fluo-silicate of potassium, which is largely consumed in France as a substitute for borax in the manufacture of flint glass, and which it is proposed further to utilize by its conversion into caustic potassa. As the somewhat abundant chloride of potassium can be readily transformed into more useful salts of the same metal by the intervention of this fluo-silicic acid, both of these compounds assume a new importance in technical operations, for the question of the best and most economical method of extracting potash from minerals is forcing itself upon chemists all the world over.

The flourine of cryolite is used in this country for the production of semi-opaque white glasses, resembling in many respects, porcelain. They are formed by melting together, in the ordinary glass pots a mixture of sand, oxide of zinc and cryolite, and consist essentially of silicates of alumnia, soda, and oxide of zinc with silico-fluoride of sodium to which latter the semi-opacity is most probably due.* The mineral, in this application, in addition to furnishing a peculiar product to the glass maker, also serves him as a cheap cheap source of soda, saving expensive and troublesome manipulation. And this brings us to another of the elements of cryolite—sodium.

The history of the production of soda compounds is one of the most interesting accounts of the methods in which chemical science has subserved and answered the demands of a thousand industries. The progress of business from the time when they were collected from the lakes of Egypt and elsewhere, up through the period of sea-weed burning for the production of kelp, varec or barilla, to the countless improvements on the original common salt process of Le Blanc, is the progress, in a great measure, of the important industrial operations of the glass and soap maker. The utilization of cryolite in the same direction, is still another important forward step which was first taken but a few years ago.

As practiced near Pitsburgh, Pennsylvania, the method of manufacturing soda from cryolite, consist in calcining the pulverized mineral with lime, which removes the fluorine from both the aluminium and the sodium, with the formation of fluoride of calcium, and alumina and soda. The lixiviation of this calcined mass dissolves the soda, and through it the alumina, and leaves the fluoride of calcium as an insoluble mass. The passage of carbonic acid through the solution of soda and alumina results in the formation of carbonate of soda and the precipitation of alumina, and these two compounds are separated by filtration, the liquid being evaporated for obtaining the carbonate, which may subsequently be converted into caustic soda or into bicarbonate. Or the product of the first lixiviation may be evaporated to dryness, with the production of aluminate of soda, which finds employment as a mordant in dyeing, being reported to heighten greatly the color on certain woollen goods. Aluminate of soda is also prepared from the mineral *bauxite*, by boiling it with a concentrated solution of caustic soda, or by calcining it in a reverberatory furnace with soda ash.

The precipitated alumina from the operation of producing carbonate of soda from cryolite, is placed in a suitable leaden vessel, and agitated with sulphuric acid and water for the production of sulphate of alumina, a compound much used in dyeing, and to some extent in paper making, and which, as formed above, is free from iron and from any excess of acid. On account of these features and the trifling cost at which it can be produced, it is rapidly superseding alum in many operations.

When acetic acid is used as a solvent for precipitated alumina, the production is an acetate of that base, which was formerly, before the utilization of cryolite and bauxite, prepared by a process of double decomposition between sugar of lead and alum, and being decidedly more expensive, was much less used than it now is.

Very nearly five thousand tons of cryolite are annually consumed in this country for the production of soda and aluminous compounds, the only establishment using it being at Natrona, Pennsylvania. Its products are remarkable for their purity, and are in request by the manufacturers of the finer qualities of glass, as well as by dyers, paper makers and sugar refiners. In Europe, the cyrolite is sometimes decomposed by long continued boiling with milk of lime, the change being essentially the same as when the process of calcination and subsequent lixiviation is employed. It has been proposed to fuse the mineral with twice its weight of wolfram, for the production of tungstate of soda, from which caustic soda can be recovered by the addition of lime, tungstate of lime being at the same time produced. A patent has been granted in this country for a method consisting in calcining cryolite with the mineral apatite or other native phosphates of lime, by which phosphate of soda is formed, which can be subsequently decomposed by lime, and the resulting phosphate of lime be employed as a fertilizer. It is, however, doubtful if any of the processes will take the place of the one first described, unless, indeed, some of their new secondary products become of greater importance, so that the caustic soda may come to be regarded as an incidental product.

The metal aluminium has also been extracted from cryolite by simple fusion with metallic sodium. There are, however, difficulties in the way of employing one mineral for this purpose, so that its use has been almost entirely replaced by the artificial double chloride of aluminium and sodium, readily and cheaply prepared from common salt and clay. The excessive cost of sodium

*From the Technologist.

*C. P. William's Jour., Franklin Institute, April, 1860.

and other expensive attendants of the preparation of aluminium, have dwarfed the development of this, which promised to be no unimportant branch of metallurgy, the unique properties of the metal fitting it for numerous and widespread applications in the arts. It now finds it chief employment not in its elemental condition, but alloyed with other metals, many of such alloys being cheaply prepared without the preliminary isolation of the alloying metals.

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THE CANADIAN
Pharmaceutical Journal.

E. B. SHUTTLEWORTH, EDITOR.

TORONTO, ONT., AGUUST, 1870.

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"EDITOR CANADIAN PHARMACEUTICAL JOURNAL TORONTO."

THE MANUFACTURE OF SALT IN CANADA.

We need offer no remarks on the advantages to be derived from the possession of salt deposits of such a valuable description as have been recently shown to exist in the North-western section of this Province. Although but four years have elapsed since the first experiment was made, at Goderich, the work has been pushed forward with energy, and, at the present time, not only is the supply of salt fully equal to home demand, but a considerable surplus is available for exportation. The attention of manufacturers should now be directed to improvements in the manner of working, by which the cost can be reduced, so as to allow a wider margin for profit in competing with the salt producers of the United States.

The Report of Dr. T. S. Hunt, on the Goderich Salt Region, recently issued by the Geological Survey, is replete with information of the greatest value to manufacturers, and contains much which is interesting to the general reader. The extent and locality of the deposits; analyses of the brines, and comparison of their strength with those of the United States, as well as full details of the methods of concentration employed here, as well as in other places, are fully entered into, and described in detail.

We learn that the first boring was made near Goderich, in 1866, when, after a depth of one thousand feet had been reached, a bed of rock salt, estimated as having a thickness of about forty feet, was reached. From this well a constant supply of brine has been obtained, up to the present time. Several other wells were opened, successfully, near the same locality; and, a year later, the salt bearing stratum was reached, at Clinton, thirteen miles to the south-east of the former locality. We may mention, in passing, that to-day—Aug. 1st—we noticed a telegram in the daily papers, announcing that the Clinton Salt Company had just been rewarded by finding a deposit, at the depth of 1,130 feet from the surface. In 1868 a boring was made at Kincardine, thirty miles north-east of Goderich, showing the existence of the salt-bearing stratum at a depth of 900 feet. Dr. Hunt thinks it probable that the whole region between Clinton and Kincardine will be found underlaid by salt, and may belong to a single basin, whose extent yet remains to be ascertained.

Wells have been sunk in various other localities, as at Tilsonburg, London, Southampton, Port Elgin, and Waterloo; most of these have been abandoned, as unsuccessful, although the proprietors of the well at Tilsonburg report the finding of brine marking from 35° to 50° of the salometer, which would seem to indicate the proximity of a saliferous stratum.

The great purity of the brines met with at Goderich has been made the subject of remark by Prof. Goessman,—former chemist to the Onondaga Salt Company—who, in 1868, drew up a report on the subject. He says "the present brine of Goderich is not only one of the most concentrated known, but also one of the purest, if not the purest, at present turned to practical use for the manufacture of salt." Allusion is made to the very small proportion of the obnoxious deliquescent chlorids of calcium and magnesium, which are only present in one fourth to one fifth of the quantity existing in the brines of Syracuse, N. Y. The brines of Saginaw, Michigan, are still more impure, containing, as shown by various analyses, from sixty to ninety times the amount of earthy chlorides found in the Goderich brines.

The Goderich Company's well has been worked continuously since October, 1866, and has yielded, for the greater part of the time, one hundred bushels of salt, daily. It appears, however, that this large consumption of brine has not been followed by a very marked diminution in its strength; for from four analyses, made at intervals of about a a year, we find the specific gravity had only decreased from 1·205 to 1·187; corresponding, respectively, to 25·70 to 23·64, per cent. of salt. The last analysis made by Prof. Hunt gave the following as the composition of the solid constituents:

Chloride of sodium..........	236·410
" of calcium..........	·190
" of magnesium......	·410
Sulphate of lime	4·856
	241.868
Specific gravity...............	1·187

A brine of this strength yields about a bushel of salt for every 24 gallons; while 40 gallons of Syracuse brine, which contains about 15 per cent. of salt, are required to make a like quantity.

The evaporation of the brines, at Goderich, is carried on in large cast iron kettles, of a capacity of from 120 to 140 gallons. These pans are arranged in two parallel rows of from twenty-six to thirty each, over a furnace, the larger ones being placed in front. so that they may receive the greater heat. The cost of a block of sixty kettles is about $1,500, to which may be added a similar amount for the construction of the furnaces.

The fuel hitherto employed has been chiefly wood, which is cut in the vicinity, and costs about $2.50 per cord. From data furnished to Prof. Hunt, by several manufacturers, the amount of salt obtained by the consumption of one cord of hard wood, is about 35 bushels, of 56 pounds each. It has been found that a cord of wood gives nearly the same results as a ton of ordinary coal—one pound of coal producing a pound of salt, so that, in Goderich, the choice of fuel is easily settled, as the cost of coal is considerably higher than that of wood.

Although the Goderich brines are fifty per cent. richer than those of Syracuse, and consequently should require less evaporation, yet it has been found that while adopting the same system, the yield of salt for a given quantity of fuel, is, in the latter place, much larger. It appears that the evaporation is too rapid for the strength of the brine, and on this point Dr. Goessmann remarks that the only difficulty with which the salt makers have to contend "is the rapid incrustation of the kettles, a trouble due to the strong concentration of their brine, in connection with their peculiar system of manufacture." Under these circumstances, the salt separates in considerable amount in very fine grains, and a hard incrustation forms on the bottom and sides of the kettles, which soon becomes several inches in thickness. This not only causes a considerable waste of salt, since these crusts are not fit for market, but, what is of much greater importance, prevents the economical application of the fuel; besides, which, the necessity of a frequent removal of the crust of salt generally keeps one of each row of kettles out of service. The crust may be removed either by mechanical means, or by dissolving it out with fresh water, a process which involves the loss of time, fuel and salt. With weaker brines, on the contrary, like those of Syracuse, the fresh supplies of brine added to the emptied kettles suffice to dissolve any existing crust, and the difficulties which cause such a serious loss at Goderich are not felt."

Dr. Goessmann proceeds in describing the manufacture at Goderich:—"The salt is, after separation from the pickle, (mother-liquor) as might have been expected from a brine like that of Goderich, of a superior color, of a hard fine grain, resembling the best brands of home and foreign manufacture, and this success is attained without any but the ordinary care required for the manufacture of common fine salt. It will be noticed that the sole objection which may be raised against the Goderich brine, is merely incidental, for the brine is too strong to be worked to its full advantage by the system of manufacture at present pursued. Evaporation by more moderate heat, for instance, on the European plan of large pans, or evaporation by solar heat in wooden vats, on the Onondaga plan, would, no doubt, prove more successful. Each of these methods would produce, with less trouble, not only a very good marketable article of its kind, but secure what is most important, the full percentage of salt, which might be expected, comparing its concentration with the brines of Onondaga, to be a difference of 50 per cent."

Other plans of evaporation have been tried, as at the Stapleton Works, Clinton, where two pans similar to those in use at Cheshire, England, have been erected. These are forty feet by twenty-one, with a depth of fifteen inches. The contents of the first pan are kept in a state of rapid ebullition, producing fine salt, while the waste heat passes under the second pan, producing a slower evaporation, and consequently, a larger grained salt. The daily product of these pans is fifty barrels of fine, and twenty barrels of coarse salt, requiring seven cords of wood. This is at the rate of fifty bushels of salt to the cord, and is a decided improvement on the process adopted at Goderich.

We recently noticed an article in the Toronto *Globe*, in which allusion was made to the defective appliances for the production of salt in this country; and the attention of manufacturers was directed to a new process of evaporation, which was said to have been tested, experimentally, with considerable success. The apparatus is described, with considerable detail, but may briefly be said to consist of a hollow iron cylinder, which is made to revolve, partly immersed in a tank of concentrated brine. A current of steam is made to pass continuously through the cylinder, which instantly evaporates the brine adhering to its outer and exposed surface. A thin layer of salt is formed, which is further augmented by the evaporation of fresh brine supplied by "drippers" placed above the cylinder. Before the dry part of the cylinder again enters the brine, it is made to pass in proximity to a stationary knife, which scrapes off the layer of salt, supposed to be in a marketable condition. The *Globe* does not pretend to say that some sanguine calculations it has seen regarding the results of the plan could be fully verified, on a manufacturing scale, but it is said that a dozen such engines, "of proper size" (!) would turn out seventy-two tons in twenty-four hours.

It is somewhat unfortunate that the size of these salt-producing engines is not specified, and the quantity of fuel stated, for therein lies the question of economy; and this is the main point. It will be obvious to any one acquainted with the subject, that the plan, however economical, could not be successfully carried into execution for the manufacture of anything but the most impure salt, and we fear that such an article would not meet with a ready sale, even for the most common purposes. The presence of impurities—as the earthy chlorids—in even the purest brines, and their non-removal by the above process, would, we fear, be insurmountable difficulties. In other methods, these bitter impurities are left, principally, in the mother liquors, which, from time to time, should be thrown away, as the value of salt mainly depends on the absence of these contaminations. Let us take the analyses made by Dr. Goessman of the brine of the Goderich Company's well, and also of a sample of manufactured salt produced by the company, and then by comparison we can easily determine the purity of the two articles, as the composition of the brine would of course represent the salt as manufactured by the cylinder process:

	Analysis of Brine.	Analysis of Salt.
Chloride of sodium.......	241·433	97·030
" calcium......	·216	·007
" magnesium.	·336	·031
Sulphate of lime........	5·433	1·430
	247·418	98·498

Before concluding this article, we would draw the attention of manufacturers to the details of the manufacture of solar salt, as described by Prof. Hunt, and to the very useful table, giving a comparison of different expressions for the strength of brine, from zero to saturation, with which the Report concludes.

CITRINE OINTMENT.

The preparation of this ointment usually falls to the lot of the druggist; very seldom is it purchased of the wholesale dealer, for everyone possesses, or thinks he possesses, some valuable secret in its manufacture, which ensures a product of better consistence, colour, and permanence, than anyone else. It may be presumed that success, in this line, is only attained after repeated failures, hence the variety of ointments termed citrine which one often meets with—ointments of every shade and character, from the cadaverous product, of ephemeral permanence, and unyielding obduracy, to the rank and oily, of pitch-like blackness, whose only claim to permanence lies in the fact that it cannot possibly become any worse.

With what timidity does the apprentice make his first attempt at this uncomprehensible unguent! He has got up the subject well by preparatory reading. The pharmacopœial directions are at his finger ends. He has read, perhaps, some dozen of the treatises "on the preparation of Ung. Hydrarg. Nit." with which our journals abound—from one he learns that if due attention is paid to a certain temperature for the reaction, success is certain; another says that the purity of the materials is the main thing; while a third asserts that he never fails under any circumstances to make an ointment that pleases his customers—a statement which may be far from complimentary to the intelligence of that class of persons. Then comes in the host of heterodox writers, who, having no fear of pharmacopœias before their eyes, boldly aver that it is perfectly impossible to succeed if officinal directions are followed, and that the best course is to double the quantity of nitric acid, divide the amount of mercury, substitute lard, neatsfoot oil, or butter, for the olive oil, or drop the lard and use the oil, or in fact, do anything but follow the book. Somewhat perplexed, our apprentice turns for counsel to an older head, and asks the advice of the chief assistant, who probably dispels the little confidence left by telling him that he will most likely make a mess of it, but that he has a form that never fails, &c. The attempt is made, however, and the ointment looks well—a little frothy perhaps. But will it keep? The next morning settles the question—the lid of the pot requires no raising, it has been lifted off by the incontrolable foaming mass within, which hangs in yeasty droppings over the edge. Our apprentice *has* made a mess of it, and is rated accordingly. This is the common termination of first experiences, and we also know that failures often occur in older hands. A reliable preparation, of definite appearance, cannot always be insured, although the officinal directions, as well as the teachings of experience, be rigidly observed. We do not regard citrine ointment as worthy of a place in any pharmacopœia—at all events, as prepared at present; it is decidedly unscientific; the reactions which occur in its formation are not perfectly understood, nor are they perfectly under control.

We have hinted that literature on the subject, is, by no means wanting; indeed, we do not think any theme has been more prolific. But the greater number of writers have only suggested slight alterations in the proportions of the ingredients, or trifling modifications of the original process. We notice, however, in the *Pharmacist*, for July, a paper by Mr. R. Rother, in which a material change is suggested. We have not had time to give Mr. Rother's process a trial, but shall do so on the next opportunity. In the meantime, we give the following extract from the paper, in which the practical details of the method are alluded to, so that our readers may experiment for themselves:—

The new process rests upon a scientific basis whose characteristic feature pervades it in every detail, and which must therefore invariably yield a uniform and definite result. Two parallel operations, separate and distinct, unite their perfect results to one complete and unchangeable whole. The formation of mercuric nitrate is effected with the requisite quantity of nitric acid, and the remainder is completely consumed in the oxidation of the fats. This insures the ultimate existence of but one compound of mercury in the finished product, and that is, as the title implies, the mercuric nitrate. It likewise admits of the oxidation of the fatty matter to the utmost capacity of all the available nitric acid, so that when the last vestige of this has disappeared the mercurial solution can be mixed with the nearly-cooled product without causing any further reaction. A very decided advantage of this process in that the enormously large vessels can be dispensed with. The nitric acid is added to the melted fat, and the heat continued until brisk ebullition sets in. This occurs mainly in the centre of the mixture, and without frothing. It is, however, of the utmost necessity not to disturb the liquids by stirring. If the reaction becomes too violent, the mixture must be removed a short time from the fire; and if the action slackens too much, it must be replaced. Finally, when all the nitric acid has been decomposed, the temperature can be considerably raised without causing any further effervescence. The boiling then is analagous to the boiling of fatty matters in general.

From the foregoing results the following formula is deduced:

Take of Mercury....................	1½	troy ounces.
Nitric Acid, sp: gr. 1.42	3½	"
Lard (pure)..	16½	"

Dissolve the mercury in 900 grains of the nitric acid, with the aid of heat, and keep the solution gently warm to prevent crystallization before it is used. Melt the lard in a suitable vessel with a moderate heat; then add the remainder of the nitric acid, and continue the heat, *without* stirring the mixture, as long as moderate effervescence continues; but if this becomes too violent, remove the mixture from the fire, and only replace it when the action slackens too much. Finally, when effervescence ceases and the liquid only boils even under an increased heat, remove the mixture from the fire altogether, and when it begins to stiffen, add the mercurial solution, and mix thoroughly.

Canadian Phosphate of Lime.

At a recent meeting of the Glasgow Philosophical Society, Mr. W. R. Hutton read a paper on the above subject. After alluding to the fact that the value of a mineral phosphate depends upon the percentage of phosphoric acid contained in it, he said that if a marked quantity of the carbonate of lime be present the value of the phosphoric acid is much reduced; owing, chiefly, to the large amount of sulphuric acid required to decompose the carbonate before the phosphate can be acted upon. The same remark held good in regard to iron, which takes up a portion of acid, and is peroxidised, forming a compound absolutely injurious to plant life. Mr. Hutton mentioned that he was supplied some months since with specimens of phosphate of lime from Canada, obtained from a face of the material nearly fifteen feet in width, and presenting, so far as yet examined, an excellent supply of the raw material. The samples differ very much from those phosphatic minerals which are now in use, and seem to indicate that if a sufficiency can be obtained the Canadian mineral will be welcomed by manure manufacturers. Some of the specimens sent were distinct six-sided prismatic crystals, while the other pieces were in masses; but both crystals and masses had a vitreous lustre, the colour on some parts being green and bluish-green, and in other places red. The following analysis was given:—

	Masses.	Crystals
Phosphate of lime...	86·61	90·82
Fluoride of calcium..	7·22	5·70
Chloride of calcium..	0·06	0·14
Carbonate of lime ...	4·47	0·38
Moisture...............	0·08	0·32
Sand.....................	0·10	0·10
	98·54	97·46
Oxide of iron		0·40
		97·86
Specific gravity......	3·142	2·166

In a physical point of view this Canadian phosphate differs from all others in being crystalline and not granular; while it differs chemically in containing more phosphate of lime and less carbonate of lime and sand.

Revival of an Old Process for the Manufacture of Caustic Soda.

Some seventy or eighty years ago a series of experiments were made by Lord Dundonald in making caustic soda by the decomposition of common salt by litharge. Subsequently, the process was conducted on a manufacturing scale, and, it may be inferred, with some profit, as the caustic soda realized, at that time, some £85 to £90 stg. per ton. The method was, however, beset with practical inconveniences, and soon fell into disuse. These difficulties have been surmounted by M. Bachet, of Paris, who has patented his improved process, and Mr. Clapham, F.C.S., recently read a paper before the Newcastle Chemical Society, giving a brief outline of the patent, and the details of working. 100 parts of litharge, 70 of salt, and 50 of lime, are ground together, with a little water, in a mill. The reactions which take place result in the formation of caustic soda, chloride of lead, and hydrate of oxyd of lead The pulpy mass is subjected to the action of a press, and the clear liquor—consisting of solution of caustic soda, chloride of sodium, and a variable quantity of lead—is filtered through hydrate of lime, with the effect of removing nearly all the lead; the liquor is then evaporated until crystals of sodium chloride form, which are fished out; the clear solution is finally finished in an ordinary caustic pot. In this way from 47 to 50 per cent. of the salt is converted into caustic soda of 70 per cent. The regeneration of the dry white lead cakes forms a special feature in the patent, but by the present way of working, nearly all the lead is recovered for further use. Mr. Clapham appears to think that when the patent is fully worked out, caustic soda will be made at a considerable reduction in cost on the present plan. The importance of the alkali trade in England may be estimated, when we consider that the yearly production of caustic amounts to 20,000 tons, valued at $1,750,000.

Relation of the Sun's Altitude to Actinic Power.

It may be interesting to those interested in photography to learn that the experiments made at Kew, to determine the chemical intensity of total daylight in relation to the hours equidistant from noon, and the conclusion arrived at—that the mean chemical power is constant in this relation—have been verified by Profs. Roscoe and Thorpe, who in the autumn of 1867, on the flat plateau of the river Tagus, instituted a series of experiments on the subject. The chief result arrived at was that, although the chemical intensity, for the same altitude, at different places, and at different times of the year, varies according to the varying transparency of the atmosphere, yet the relation, at the same place, is always represented by a straight line.

Canadian Inventors in the United States.

We notice that under the recently amended Patent Law of the U. S., Canadian inventors, in common with other foreigners, are allowed to apply for patents on the same terms as citizens of the United States. The *Scientific American* thinks the example worthy to be followed by the government of the Dominion. We heartily agree with our contemporary, and hope that our law-givers will fall in with reciprocity—at least as far as genius is concerned.

Detection of Fusel Oil in Alcohol.

The *Revue Hebdomadaire* gives a simple test for the detection of amylic alcohol in spirits, which, if effective, is calculated to be of considerable value. The spirit to be examined is mixed with an equal bulk of rectified ether, and a like quantity of water; the mixture is shaken in a burette, or glass tube, when, after a short rest, the ether rises to the surface, and is removed by a pipette. This must be left to spontaneous evaporation; if the alcohol contained fusel oil, it will be left behind, and may be easily recognized by its pungent smell.

Hydrocyanic Acid in Tobacco Smoke.

After a series of carefully conducted experiments, Drs. Poggiale and Marty (*Journal de Pharmacie*) deny the statement made by Dr. Vogel, that hydrocyanic acid can be readily detected in tobacco smoke. According to these investigators, tobacco smoke does not contain hydrocyanic acid, nor does it exist in any of the condensed products of such combusbtion.

Dichloracetic acid is said to be the best caustic for the removal of warts; one application is commonly effectual. The acid should be carefully put on with the sharp point of a glass rod.

Notes and Queries.

R. D. E. Toronto.—Test for the Presence of Water in Ether.—We recently noticed a test which is said to detect the presence of 2·5 parts of water in 1,000 of ether. It is based on the fact that perfectly dry phenylate of potash is quite insoluble in anhydrous ether. Should even the above quantity of water be present, the phenylate partly dissolves, communicating more or less of a reddish brown color. This test will suit your purpose better than any with which we are acquainted.

Passive State of Metals.—*Assistant* says that in making *liq. ferri pernitratis* he employed the ordinary double acid, sp. gr. 1·370, without dilution; on adding the iron, which was in the form of clean turnings, no action ensued. The iron and acid were suffered to remain in contact during the course of a night, and next morning, on being examined, the metal showed no traces of solution, appearing as bright, when viewed through the acid, as when first immersed. The glass vessel containing the mixture was shaken, when a vigorous action at once set in, during which the greater part of the solution was lost through boiling over. *Assistant* wants us to explain the apparently strange circumstance, and asks us if we ever heard of a parallel instance. We will answer the last part of the enquiry by saying, that we have frequently noticed the same phenomena, both in regard to iron, and other metals. Not very long ago we had a lot of silver—some twelve pounds of American coin—which obstinately refused to dissolve, although in contact with the requisite quantity of acid—diluted as usual—for twenty-four hours; on moving the coin with the end of a glass rod, solution commenced, and continued without interruption until the specified quantity of metal was all consumed. This *passive state* of metals, as it has been termed, may be induced in a variety of ways, one of which is that to which you refer—the dipping of iron wire into strong nitric acid. By holding it for a few seconds, in the flame of a spirit lamp, the same end is attained. It has been suggested that this passive iron might be turned to good account as a substitute for platinum, in galvanic experiments; but the passive state is liable to be disturbed by such very slight causes, that the method is of no practical use. The phenomena may be explained by supposing the metal to be instantly covered with a thin film of oxide, which serves as a protection against further action. Hence, when shaking the vessel which contained your iron, the coating of oxide was broken, and the acid at once attacked the surface of metal—the stirring of the silver with the glass rod was attended with the same result.

C. Anderson.—Chloride of Gold.—This salt is a terchloride, having the formula $Au\,Cl_3$. The crystals which fall from a concentrated acid solution are not those of the above chloride, but another salt, the chloride of gold and hydrogen. The salts, used in photography, under the names of chloride of gold and calcium, or sodium, are mixtures of chloride of gold, with a variable amount of the chlorides of calcium, or sodium. The true double salt, chloro-aurate of sodium contains equivalent quantities of each of the chlorides, and has the composition indicated by the formula $Na\,Cl., Au.\,Cl_3, + 2H_2O$.

T. H. S.—To Preserve Lemon Juice.—Select good, sound lemons, free from decay; after pressing out the juice, strain through a muslin, or hair seive, and put into clean, dry bottles, leaving only sufficient room to insert the corks. Put the bottles in a water bath, and heat to 212°. If the bottling is done in winter, a temperature of 180° will be sufficient. While the juice is still hot, cork the bottles, and seal with bees wax. If the operation is carefully performed, the juice may be preserved, at least, a year.

Coriander Seed, may be protected from the ravages of the little insect that is so liable to infest it, by sprinkling a few cardamons on the top of the seed.

Subscriber wants to know if Japan Wax is a production of the animal or vegetable kingdom. It is derived from a native tree of Japan, the *Rhus succedaneum*; natural order, *Anacardiaceæ* and is, consequently, of vegetable origin. It is generally of a dirty white, or yellowish color, and though resembling beeswax, in some of its properties, it has a different composition, containing it is said, twice as much oxygen, and consisting of palmitic acid united with oxyde of glyceryle. Its fusing point is also lower, being about 120° to 130° Fahrenheit, while that of beeswax is 145°.

Changes.

The partnership existing between Messrs. Lane & Perry, Fergus, has been dissolved by mutual consent. The business will be continued by Mr. R. H. Perry.

MONTHLY MEETING.

The regular monthly meeting in connection with the Ontario College of Pharmacy, was held in the usual place, on Friday evening, August 5th. The chair was taken by Hugh Miller, Esq., Vice-President.

Minutes of former meeting were read and approved; and after the transaction of ordinary routine business, the following gentlemen were elected members of the College:—

Duncan Ferguson................Douglas.
W. A. Preston......................Dingle.
William G. Stark..................Hamilton.
Robert C. Holbrook......... ..... "
George H. Harkness..............Mono Mills
R. Wood ....Erin.

ASSOCIATE.

Price Jackes ....Toronto.

In pursuance of a suggestion made by the late Council, in their annual report, it was proposed by Mr. Rose "that a committee be appointed to secure papers to be read before the College, or to otherwise increase the interest of the monthly meetings." The committee named consisted of Messrs. Dunspaugh, Shuttleworth, and Margach. The Secretary expressed his regret that more members did not take an active part in the meetings of the Society, and, more especially, in the reading of papers. He noticed that in the reports of the proceedings of kindred associations there was, generally, no lack of communications of this character; but if the intelligence and activity of our Society was to be judged by the number of papers brought before it, the estimate formed would not be of the most flattering character.

A number of gentlemen expressed themselves in favor of the motion, which was carried, and the appointment of the Committee confirmed.

Mr. Brydon said that he would suggest, as a subject for discussion, at the September meeting, "the best formula for the preparation of the so-called Syrup of the Hypophosphites." He had, so far, failed in purchasing a syrup of a reliable character; and in those syrups said to contain iron, he had only found the merest trace. He thought it was the duty of pharmacists to prepare this class of medicines themselves. The discussion was agreed to, and, there being no further business of importance, the meeting adjourned.

H. J. Rose, *Secretary.*

Selections.

On Artificial Alizarine.

At a meeting of the Glasgow Philosophical Society, Mr. J. Wallace Young characterized madder and its preparations as being among the most useful dye-stuffs used in calico-printing and dyeing. The importance of madder is due to the fact that with different mordants it gives a variety of colors—iron mordants giving all shades from black to delicate purple; those of alumina giving colors from a dark red to a fine pink; and a mixture of them giving various shades of chocolate. Madder root has probably undergone more chemical investigation than any other colouring matter—the investigators being Robiquet and Colin, Claubry, Persoz, Runge, Schunck, Higgin, &c. The most important colouring matter is Alizarine; from it may be obtained all the durable and brilliant colours yielded by madder itself. Mr. Young described the method by which alizarine may be obtained readily from madder root, and mentioned that the substance appears ultimately as a sublimate of fine orange red needles, which are slightly soluble in hot water, and readily soluble in boiling alcohol. Owing to the high price of madder and madder preparations, much interest attaches to every substance which purports to be a substitute for madder. A good substitute would be gladly welcomed. M. Roussin announced a few years ago that he had succeeded in obtaining artificial alizarine from napthaline, but further investigation proved that he had been mistaken. More recently, it had been announced in the *Chemical News* and elsewhere that artificial alizarine had been successfully obtained from anthracen.

Mr. Young then stated the results of his experiments upon two madder substitutes, one of continental manufacture, a thin dark-colored paste, containing 5.7 per cent. of dry residue, the other of English manufacture, supplied in the form of an opaque brownish liquid. The former contained a large amount of colored matter, but further purification was necessary before it could be used as a madder substitute. When mordanted cloth dyed with it was boiled with solution of soda, the colours were found to be rather fugitive. Cloth prepared for Turkey-red absorbed the dye-stuff readily, but the same want of fastness was observed. When mixed with iron and aluminous mordants, and printed on in the way in which madder extract is used, the colours were found to be dull and not sufficiently fast. A sublimate obtained from the dried paste closely resembled natural alizarine, but was rather lighter in colour. It dyed mordanted cloth well and withstood treatment with soap. The English made madder substitute yielded a red rather yellower than that yielded by natural alizarine, a black of equal, if not superior quality to madder-black, but the chief difference was in the purple, which was rather slate-coloured than anything else, contrasting most unfavorably with the fine shade of color given by madder. The yellowness of the red seemed to depend pretty much on the proportion of tin salt used in the clearing. As with madder and its preparations, the development of the colouring matter of the artificial alizarine is increased by tanning materials, as sumac, and deteriorated by chalk. The dried no seed of the brown artificial alizarine liquid yielded by sublimation a crystalline body of a yellower shade than that of the crystals of the natural alizarine. In order to compare the artificial alizarine with the natural substance and with purpurine, which is another madder extract, the author dissolved each of them in weak ammonia, and added barium chloride; they all yielded purplish precipitates. The natural alizarine precipitate was of a fine bluish-purple color, and the supernatant liquor was almost quite clear; that from the artificial product was much redder, and the supernatant liquid was highly colored; the purpurine precipitate was of a purplish-red color. The natural alizarine and purpurine precipitates did not seem to be much affected by being washed several times with cold water, but the artificial alizarine precipitate gradually dissolved in the washing water and finally disappeared. Mr. Young thoroughly tested the dyeing powers of the new alizarine by comparing the results produced upon mordanted cloth either with equal weights of sublimed alizarine obtained from the two artificial preparations and from madder, and of purpurine; he showed the specimens of cloth so treated. Instead of the dark full red given by the natural substance, the artificial alizarine yielded only a yellowish-red, much like that of the purpurine. Its purple was of a slaty tint, but the chocolate and black differed very slightly from those of the natural alizarine. The purpurine scarcely gave any purple, and the same is true of the Continental and English madder substitutes. Alcoholic solution of natural alizarine gives a fine purple color with copper acetate, and with the same reagent the artificial preparation gives a very red purple. No characteristic bands appear in the spectrum when artificial alizarine is used, and, therefore, purpurine is shown to be totally absent. The author was not aware if anything had been done towards establishing a formula for the new alizarine, but his opinion arrived at after performing many practical experiments, was that there was some essential difference between the artificial and the natural substance. He had found no superiority in the new substance. In a supplement to the paper of which the foregoing is an abstract Mr. Young said that the manufacture of artificial alizarine is carried out in two or three ways by continental chemists, and from the examination which has been made of the products, it would appear that some of them consist of a mixture of alizarine and purpurine, in different proportions, and some of alizarine, or of a substance intermediate between the two. It had been said that it was more advantageous to use the artificial alizarine as a dry paste, rather than in the dry state, but he could find no difference in the dyeing power. He had treated the artificial alizarine with boiling dilute sulphuric acid, as in garancine making, afterwards washing thoroughly and drying; he had also dissolved it in sodium carbonate, precipitating with acetic acid, washing and drying; but the colors given on drying did not seem to be modified in any way.

A discussion followed, in which several gentlemen took part. There seemed to be much doubt as to the mode of preparing the artificial alizarine, and if it could be produced in large quantity, considering the small amount of anthracen which exists in coal-tar. On that point, however, it was stated by Mr. Hogg that it could be supplied in considerable quantities and at such a price as would make it cheaper than madder.—*Chem. News.*

On the Estimation of the Alkaloids in Cinchona Barks.

Mr. H. Hager determines the total amount of quinine, quinidine, and cinchonine in cinchona bark, by precipitation with picric acid; the method unfortunately, does not surmount the great difficulty, viz., that of determinating the amount of quinine in presence of the other alkaloids. The author proceeds as follows:—Take 10 grammes of the bark coarsely powdered, add 130 grammes of water, and subsequently 20 drops of a solution of caustic potash, sp. gr. 1.3. Boil this mixture gently for fifteen minutes, occasionally stirring, and then add 15 grammes of dilute sulphuric acid, 1.115 sp. gr., boil for fifteen or twenty minutes; allow it to cool a little, pour it into a measure, and make up with water 100 c.c. A portion of the liquor is then filtered into a cylindrical glass vessel, graduated say for 60 c.g., and to this is added 50 c.g. of a solution of picric acid, saturated at the ordinary temperature; this quantity will generally be found sufficient to effect the complete precipitation of the alkaloids. The mixture is allowed to stand for half-an-hour, the precipitate collected on a weighed filter, carefully washed and dried at a temperature of 100° F. The proportion which would have been derived from the total quantity of liquor may be calculated from the weight of this precipitate, and hence the amount derived from 10 grammes of bark. According to the usual composition of the Calisaya bark, 10 grammes of this variety should yield at least 0.824 grammes of picrate, corresponding to 0.35 grammes of the mixed bases, quinine, quinidine, and cinchonine.—*Chemist and Druggist.*

Of what Sponges Consist.

The common washing sponge is still considered by many naturalists as a vegetable species, and in fact most people look upon it as of vegetable growth. Still, it seems now to be definitely established that it belongs to those low forms of animalculæ that are comprised under the term zoophytes. "Will you make us believe," here you exclaim, "that this fibrous net-work, in which one is unable to detect the least indication of anything that reminds us of animal life, is not a moss or something like it?" Exactly so. However, the sponge which you use daily in your ablutions, and which forms one of the most indispensable articles of the toilet, is not the animal as it lives and thrives, but only its horny substance, its skeleton, if you like to call it so. When cut loose from the submarine rocks on which it is found at considerable depth, the sponge presents itself to you as a black, jelly-like mass, which, when left in the air for only a few days, will give off a most disagreeable smell, originating from the gelatinous part in question. In the natural sponge, you have not one single individual before you, but a regular colony of animalculæ. The elastic, horn-like net-work of your toilet-table is then impregnated to its innermost parts with a slimy substance that is penetrated throughout by fine capillary tubes, not visible to the naked eye. Upon examining this curious being further, exceedingly fine cilia (eye-lashes) will be discovered. These project around the entrances of the pores, and by their motion produce a current which, in passing through the numberless tubes, leaves behind whatever they may need as food. The horny net-work is probably only their secretion, like the house of the snail. But that the sponge is of animal origin is now proven by the discovery of spermatozoa and embryos in the interior, as well as by the consumption of the fibrous elastic part itself, which contains one of the constituents of silk and the spider's web.

In order to prepare it for use, it is first left in the air for a short time, until the gelatinous part is decomposed, then the mass is washed in hot water, and afterwards in a bath of dilute muriatic acid. The toilet sponges are bleached by means of chlorine and hyposulphate of soda. The so-called wax sponges, that are used by doctors for dressing ulcers, are purified sponges dipped into fluid wax, and then pressed between hot plates.

The French and Austrian governments have lately commenced to rear sponges artificially—the former on the shores of the Mediterranean, the latter on the coast of Delmatia. The cultivation is said to be perfectly successful, and to yield large protfis.—*Druggists' Circular.*

Estimation of the Value of the Various Linds of Cinchona Bark.

Dr. A. E. Vogl.—Forty grms. of previously-pulverised bark are intimately mixed with 10 grms. of quick-lime, and made into a thin paste with water; and this mixture is dried (the temperature is not stated). The dried mass is pulverised, and repeatedly exhausted with boiling alcohol at 90 per cent. (600 c.c. are a sufficient quantity for this purpose; the alcoholic solution is filtered, and to the filtrate are added about 5 c.c. of dilute sulphuric acid. The ensuing precipitate of gypsum having been removed by filtration, the alcoholic fluid is submitted to distillation, and, after having been greatly reduced in bulk, is further evaporated to a very small bulk on a water-bath, whereby, a flocculent, resinous, vanilla-like smelling aromatic substance is precipitated. After this material is again removed by filtration, to the filtrate is added a sufficient quantity of a solution of caustic soda as is required for the precipitation of all the alkaloids contained in the bark. These bodies are, by this mode of treatment, obtained in a high degree of purity in the shape of a white caseous, or crystallino-flocculent precipitate, this should be collected on a previously-tared filter, washed with the smallest possible quantity of water, and thoroughly dried, and next weighed. In order to separate the different bases from each other, the aforesaid precipitate is digested for twenty-four hours in a small flask with about 5 c.c. of ether. The ethereal solution is filtered off from the insoluble residue, which is first washed with ether, and next dissolved alcohol. Each of the solutions so obtained is evaporated, yielding, in some instances, an amorphous, in others, a crystalline residue. These residues are dissolved in dilute sulphuric acid; and, after these solutions have been filtered, the alkaloids are precipitated from these solutions by means of a caustic soda solution, which has been titrated so as to correspond with the dilute sulphuric acid supplied as just stated. This method of the estimation of the value of the cinchona barks is recommended by the author for the reason—(1) that it is easily and rapidly executed; (2) because it affords complete exhaustion of the valuable constituents of the bark, with very little, if any, loss; (3) because the bases are obtained directly in a high degree of purity. There are appended to this paper a series of results of analyses of various kinds of barks, made partly by this and partly by other well-known methods, as devised by scientific men who, like Dr. D. Vrij, Dr. Rabourdin, and Prof. Schneider, are high authorities on this subject. From the results here published, this method deserves every praise.—*Neus. Jahr. für Phar. in Chem. News.*

Conium.

Dr. J. C. Reeve, in the *American Practitioner* for June, calls attention to the preparations of conium. As a rule they are almost worthless, as he and his professional friends have found by experience, and as has been demonstrated by Dr. Harley, of London. This drug is nevertheless one of decided power, and Dr. Harley has shown that the *succus conii* prepared from the fresh herb, by a process peculiar to the British Pharmacopœia, is a reliable preparation. As this is not within reach of the American practitioner, attention is called to the fact announced by Wm. Manlius Smith to the N. Y. Medical Society in 1867, that a *fluid extract of the unripe fruit* is also active and reliable, producing all of the characteristic effects of the drug. Attention is called to two facts announced by Dr. Harley, namely; that a high temperature, in preparing, injures the value of conium extracts, and that the mousy odor, developed by triturating them with liquor potassæ, is a fallacious test of their value.

The action of conium is especially directed to the nervous centers of motion, producing an effect opposite to that of strychnia.

As a therapeutic agent it is applicable to affections marked by irritation of the motor centres, whether direct or reflex. It has proved of great service in the irritability of dentition, in laryngismus stridulus, some forms of chorea and epilepsy, irritability of the reflex function in spinal disease, and as a sedative to irritated sexual organs. Dr. R. has found it especially valuable in *convulsive and irritable coughs,* like whooping cough, and the distressing cough of phthisis and bronchitis. In the latter it proves an excellent substitute for morphia, quieting the cough without disturbing the functions of the stomach and bowels.—*Mich. University Journal.*

Professor Seely on Ammonium Amalgam.

The *Mechanics' Magazine* contains the following criticism on Professor Seely's recent papers upon this subject: "We referred so many times to Mr. Graham's experiments on the absorption of hydrogen by palladium, and his views on the metallic nature of hydrogen, that we may give a passing notice of the latest objections to Mr. Graham's theory. Professor Seely, of New York, has made some experiments with the so-called ammonium amalgam, and has come to the conclusion that it is no amalgam at all in the ordinary acceptation of that term, but merely a froth produced by the entanglement with the mercury of the mixture of ammonia and hydrogen set free on the decomposition of chloride of ammonium. The strongest evidence in favor of the correctness of this view is to be found in the fact, that when the so-called amalgam is subjected to pressure, its volume changes apparently in accordance with Marriotte's law of gaseous volume. Thus, at all events, it must be considered as proved, that admitting the existence of ammonium in amalgam, it is neither a solid nor a liquid, but a gas. Professor Seely contends that the expansion of palladium on the absorbtion of hydrogen is analogous to the swelling of the mercury on the absorption of the two gasses named; and that if the particles of palladium were as free to move as those of mercury, a palladia froth would be produced. There may be something in this objection, which does not, however, touch Mr. Graham's strongest point. In another sentence the American Professor goes decidedly wrong when he asserts that oxygen is more readily absorbed by metals than hydrogen, and yet no one has a theory of oxygenium. Mr. Graham found that oxygen was less readily absorbed; and he distinctly announced his belief in the existence of the metal oxygenium.—*Scientific American.*

On Benzoic Acid and Gum Benzoin.

Julius Löwe.—The contents of this paper are the answers given to four queries, viz:—(1) Does benzoic acid pre-exist in gum-benzoin ready-formed and in a free state? (2) Is the benzoic acid present in the resin combined with a base? (3) Is benzoic acid a product of the oxidation of a part of the resin formed by the taking up of oxygen during the melting of the resin? (4) Is benzoic acid a product of a portion of the resin formed by the fusion of that substance? The author's experiments, detailed at great length, commenced with the finding of a reply to No. 3, and the result is a negative—viz., that when the process of sublimation (as usually employed for obtaining benzoic acid from gum benzoin) is carried on in atmospheres of hydrogen or carbonic acid gas, the quantity and quality of the acid obtained are the same as when the process is carried on in contact with air. As regards the replies to Nos 1, 2, and 4, a series of experiments made in various ways proved, undoubtedly, the pre-existence of ready-formed benzoic acid in the resin. The last portion of this paper is devoted to the very minutely-detailed description of the best practical method of the preparation of benzoic acid from the resin.—*Jour. fur Praktische Chemie, Chem. News.*

Coloring Syrups with Aniline Colors.

Prompted by various cases of illness caused by the use of syrups sold under the name of "raspberries," "currants," etc., Vandevyvere, in Brussels, according to the *Journal de Pharmacie d'Angers*, has analyzed some of these syrups, and found that none of them contained a trace of the fruits after which they were named. Many consisted of a solution of glucose, colored with aniline red, *Rubin impériale* or fuchsine, and mixed with tartaric or citric acid and a few drops of fruit essences. Vandevyvere discovered in 200 grammes of syrup, 0.05 grammes of fuchsine, which, in view of the fact that it is often mixed with arsenic acid, is to be taken into consideration. To distinguish genuine syrups from artificial ones, the following reactions are indicated: Both are discolored by chlorine, but in the latter a precipitate is produced similar to the oxide of iron formed by the addition of ammonia to one of its solutions. Sulphurous acid discolors both kinds of syrup. Sulphuric, nitric, and muriatic acids turn genuine syrups brighter, while artificial ones assume a yellow orange color. Caustic potash discolors syrup colored with aniline, and turns genuine syrups a dirty green. The color of artificial syrups is not altered by an addition of carbonate of potash, but genuine ones are turned green. Acetate of lead colors genuine syrups greenish, fuchsine syrups red. Adehyde colors fuchsine syrups red.—*Journal of Applied Chemistry.*

Preparation of Bromide of Sodium on the Large Scale.

M. Castelhaz.—The author, a manufacturing chemist, states, in the first place, that, according to the communications received by him from several physicians who have applied bromide of sodium in their practice instead of potassium, the efficacy of the former is far greater than that of the latter. As regards the preparation of this salt, the author says: The best plan is to prepare, first, bromide of ammonium, by causing bromine to fall drop by drop into dilute, but pure, liquid ammonia contained in a series of Woulff's bottles, in order thus to prevent the loss otherwise inevitably resulting from the volatilization of the products formed by the great heat disengaged on the bromine and ammonia uniting. The liquids, after saturation, are evaporated in a cast-iron retort, to which an earthenware receiver is fastened, wherein are collected the vapors of water, any excess of ammonia, and some bromide of ammonium, which is accidentally carried over. The bromide of ammonium thus obtained is converted into bromide of sodium, by being mixed with pure carbonate of soda, and the application of sufficient heat to volatilize and sublime the carbonate of ammonia formed by the reaction. This mode of preparation yields, after re-solution of the bromide in water, and evaporation similar to that used for chloride of sodium, perfectly pure and anhydrous bromide of sodium.—*Comptes Rendus.*

Detection of Logwood Colour in Wines by means of Neutral Acetate of Copper.

J. Lapeyrère—The author states that while studying some of the properties of the coloring principle of logwood *(bois de Campêche)*, he found that the hematine it contains yields a sky-blue color with salts of copper. In order to apply this test to wines for detecting if they are doctored with logwood, it is only necessary to place strips of good filtering paper —Swedish being preferred, into an aqueous solution of neutral acetate of copper, and, after drying, use one of these slips to test the wine suspected to be adulterated with logwood color, by dipping the paper into the wine; on removing it from that fluid, care should be taken to cause the adhering drop of wine to flow backward and forward over the paper, which is next rapidly but carefully dried. If the wine be as it naturally ought to be, the colour exhibited after drying will be grey, or rose-red grayish; but if logwood is present, the tinge will be distinctly skyblue.—*Journal de Pharmacie et de Chimie.*

On the Presence of Manganese in Milk and in Blood.

Professor E. Follacci, after analysing several varities of human blood, differing in respect to the sex, age, and temperament of the persons from whom they were derived, arrives at the conclusion that manganese is one of the essential constituents of the blood. The analysis of the milk of woman, the cow, the goat, and the ass, indicated that milk contains manganese even in greater proportion than the blood. The amount of manganese in these two fluids is not, therefore, in relation to the amount of iron which is found in greater proportion in the blood. The author describes in detail the process by which he detects the presence of manganese in the milk, of which the following is a brief account: —300 grammes of milk are evaporated to a pasty consistence, and then completely carbonized, and subsequently calcined in a platinum crucible. The ash is then exhausted with successive quantities of distilled water, the extraction of all the soluble parts being ascertained by the fact that nitrate of silver ceases to give a precipitate with the decanted fluid. The residue is then introduced into a test-tube, treated with a small quantity of nitric acid, and evaporated to dryness. The residue, after cooling, is treated with a small quantity of dilute nitric acid, and heated to 212°; binoxide of lead is then added, and the mixture again boiled for about a minute. After subsidence, the purple colour of the fluid may be readily seen, due to the presence of permanganic acid derived from the manganese contained in the milk. A similar method may be employed to determine the presence of manganese in the blood—*Chemist & Druggist.*

Pyrophosphate of Iron and Soda.

The *Journal d'Anvers* gives the following method for preparing this double salt:—

A solution of 6 parts of pyrophosphate of soda in 120 parts of water is mixed with another solution containing 13 parts of liquid perchloride of iron of 1.44 sp. gr. and 78 parts of water. The precipitate is washed, and then dissolved in a warm solution of 4 parts of anhydrous pyrophosphate of soda in 36 parts of water. The liquid is evaporated till a pellicle forms, and allowed to crystallize. The crystals are dried at the ordinary temperature. Or the concentrated solution may be precipitated by the addition of four times its volume of strong alcohol. A translucid white precipitate is obtained.

The ferric pyrophosphate of soda occurs in the form of yellowish transparent plates. Its composition is stated to be $(Na_4\ P_2\ O_7)_3\ (Fe_2\ 2PO_4)_2 20H_2O$.

Miscellaneous, &c.

Novel Application of Aniline Colours.

The *Chemical News* relates the following incident: Some few weeks ago, Madame A. W. Hofmann gave a grand entertainment and ball to a large number of her eminent husband's pupils. In the grand ball-room were placed, on the table, a large number of bouquets of flowers (artificial, of course,) all snow-white, and close by, on the same table, a large number of pieces of beautifully-white silk ribbon; at the other end of the room a fountain was arranged, throwing, from narrow openings, jets of exquisitely-perfumed eau de Cologne. The bouquets were taken by the ladies, and the ribbons by the gentlemen; and while waltzing together, and thus arriving at the end of the room where the fountain played, the ladies holding their bouquets to be sprinkled over with the perfume, beheld the white flowers become suddenly beautifully red, violet, blue, yellow, and green coloured, while the ribbons carried by the gentlemen assumed, under the same influence, similar colours. The secret of this trick is simply that the objects alluded to had been very gently dusted over with the dry powders of variously-prepared aniline colours, and, on becoming moistened by the eau de Cologne (alcohol), these powders became dissolved, and imparted colours to the objects.

The Cause of Left-Handedness.

We find the following item in the *Independent*:—It would be worth while for our anatomists to record their observations on this point. "The cause of right and left-handedness is generally anatomical. Prof. Hyrtl says that in two cases out of 100 the left subclavian artery has its origin before the right, and in these cases complete left-handedness exists. The blood is ordinarily sent with more force, according to Hyrtl, through the right than through the left subclavian artery, thus nourishing the muscles of the right arm more fully. In the rare cases where the internal organs are transposed, the heart being on the right side, there is also left-handedness."—*Med. & Surg. Reporter.*

Poisoning by Copaiva — Examination of the Blood.

In the *Australian Medical Journal* for January, a case of sudden death is described, which was supposed to be caused by the free use of copaiva. The patient had been sleeping, uttered a scream, was found sitting up in bed, and died immediately. The kidneys were found red and congested, the bladder empty, and the brain congested. The blood being examined, three grains of copaiva were extracted from four ounces—giving an ounce of balsam in the entire circulation. It was supposed by some that the death was occasioned by a spasm of the heart, and not directly by the copaiva.—*Pacific Medical and Surgical Journal.*

First Importation of Cinchona Bark from Java.

It appears that, toward the end of last year, a quantity of some 930 lbs. of this bark has been exported from Java to the Netherlands. According to analysis made by Dr. Moens, in Java, this bark contains from 2·4 to 7·5 per cent. alkaloids, of which quantity 0·59 to 3·67 is quinine. The loss of weight occasioned by the drying of the bark has been found to amount to 66 per cent. There is every prospect that within some six or seven years hence Java will largely export this drug; and the cultivation of the cinchona trees is also to be extended to Sumatra, Celebes, and the Moluccas.—*Rev. Hebdom.—Chem. News.*

Value of the Alkaloids of Cinchona.

By order of the Government, the several alkaloids of Peruvian bark have been put to the test in India, in 2,472 cases of fever. The result, as reported in the *Medical Times*, is, that the sulphate of quinidia possesses an anti-febrile power equal to the sulphate of quinia; that the sulphate of cinchonidia is slightly less efficacious, and that the sulphate of cinchonia, though very inferior to the others, is a very useful agent in the treatment of fevers.—*Pacific Med. and Surg. Journal.*

A New Test for Albumen.

A writer in the *British Medical Journal* states that Dr. C. M. Tidy has found that equal volumes of acetic and carbolic acids is a far more delicate test for the presence of Albumen than any other agent that has been proposed. In using this with urine, it is necessary to shake the test tube, as some opacity is produced by the mere admixture of fluid, which, however, disappears on agitation.—*Mich. University Journal.*

A new Use for Potatoes.

A foreign exchange describes a new mode of preparing wood pulp for paper making, which consists in using potatoes in lieu of alkaline solutions usually employed to effect from poplar and other white wood fibers the removal of gummy matter. The fibres are to be boiled in water in which there is placed among them, in the boiler, on being filled, 2 cwt. of floury potatoes to each ton of raw fibers, such potatoes having been previously steamed in a separate vessel filled for the purpose, and passed through a strainer, sieve or colander, to remove the peel, which is injurious in some cases, but the potatoes can also be used raw with the fibres, after being well washed. The gummy matters are thoroughly extracted from the fibers, and by boiling for two, four, or six hours, according to circumstances, the process will be found quite sufficient to prepare this class of fibre for bleaching to a pulp in every way fit for the manufacture a good white quality of printing, or similar descriptions of paper.—*Jour. of Appl. Chem.*

Aniline Photographs.

The process consists of preparing paper with the bichromate of potash, to which some phosphoric acid has been added; when dry, the paper is exposed under a *positive* for a sufficient time, and when removed from the printing frame the picture is held over a dish containing a solution of aniline in benzole. The benzole in volatalizing, carries with it the vapor of aniline, and when the latter comes in contact with the unaltered bichromate on which light has *not* acted, a rich black body is produced, which is believed to be a very stable compound. Washing in water and dilute sulphuric acid, now clears the lights of the prints, and leaves a paper positive, which is the equivalent of a carbon print.—*Scientific American.*

Adulterations of Port Wine.

Professor Silliman, of Yale College, recently had occasion to examine some port wine, and testified in reference to it in a court of justice as follows: "It is an imitation of port wine, very turbid, and heavily laden with sugar or molasses and with coloring matter. It also contains oxide of lead, sulphuric acid, over 21 per cent. of alcohol, and over 19 per cent. of sugar or molasses. The specific gravity is 1,015, water being 1,000. Analytically, I determined the quantity of the ingredients. It contains sulphuric acid, 10 grains to the gallon, partly free as oil of vitroil and partly combined in alum; oxide of lead or litharge in poisonous quantities, and turbidity, or in clear liquor by filtering, about 45 grs. to the gallon. The alcohol obtained from this liquor by distillation had an acid taste. It had also an offensive odor from coloring matter. The liquor contained deleterious and posionous substances. I have a small vial of oxide of lead. * * * The quantity found by me is ample to affect any liquor. This liquor is stronger in its contents of lead than most waters that are poisoned by it. It is in sufficient quantities to be deleterious to the human system.—*Jour. of App. Chem.*

Tinning Iron without Fuel.

A cold process of tinning has been invented by Mr. Dauble, of Bellefontaine, France. The iron is treated by successive immersion in baths containing cold solutions of salts of tin, with the addition of a certain amount of organic matter, such as fecula or starch, which has always been found valuable, both in tinning and galvanization.

The solution patented is thus made: To each 20 gallons of water add 6 lbs. of rye flour, and let it boil for about half an hour; filter it, and afterwards add 212 lbs. of pyrophosphate of soda, 34 lbs. of crystalized salt of tin, 134 lbs. of neutral photochloride of tin, and from 3 ozs. to 4 ozs. of sulphuric acid. When the salts are dissolved the solution is distributed in eight or ten wooden vats, a little additional water being added to the first two or three of the vats. The wire is passed successively through the whole of the vats, and if great brilliancy of surface is required, also through draw plates at intervals, and the wire, while retaining all its rigidity, becomes covered with a brilliantly polished coat of tin.—*Scientific American.*

Trade Report.

Our favorable report, in last number, as to the state of trade, will equally well apply to the past month, orders having come in freely from all quarters.

There is a decided tendency to advance, in nearly all classes of goods; especially those of German manufacture, which, consequent on the total stoppage of importation, are from twenty to fifty per cent. dearer.

Quotations for the latter class are not to be relied upon, as they are changing daily.

We note, in favor of retail buyers, Acid Benzoic, Bismuth and Leptandrin, which are all materially lower.

Against the buyer are Tartaric Acid, which is rising steadily, Vanilla almost out of market, Ext. Hyoscyamus, owing to a failure of crop of the herb, Glycerine, from stoppage of German supply. Oil Wintergreen is worth rather more than our quotation.

In dyestuffs, Magenta will be noticed much dearer, with a probability of a further rise, Indigo is a little lower, and there is a good deal of a made-up article in the market, purporting to be Madras, against which we would advise our readers to be on their guard.

In Spices, Black Pepper still maintains a very high figure.

In Paints, White Lead has commenced to advance, and there will likely be an advance made by the manufacturers, on that ground in Oil.

Naval stores are quiet, with the exception of Turpentine, which is very firm at advanced prices.

WHOLESALE PRICES CURRENT.—AUGUST, 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 14	0 15
" Tart. "	0 50	0 60
Alcohol, 95%	1 77½	1 87½
Arrowroot, Jamaica	0 20	0 22
" Bermuda	0 45	0 65
Alum	0 02½	0 03½
Balsam, Canada	0 24	0 35
" Copaiba	0 78	0 80
" Peru	3 80	4 00
" Tolu	1 20	1 40
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 15	0 18
Berries, Cubebs, ground	0 25	0 35
" Juniper	0 06	0 10
Beans, Tonquin	0 60	1 10
" Vanilla	14 00	15 50
Bismuth, Alb.	4 60	5 00
" Carb.	5 00	4 60
Camphor, Crude	0 35	0 45
" Refined	0 45	0 55
Cantharides	1 40	1 50
" Powdered	1 55	1 65
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 85	1 00
" Black	1 30	1 75
Colocynth, Pulv.	0 80	0 93
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	0 57	0 63
" " sorts	0 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 Draconi	0 60	0 70
" Scammony, pow'd	5 60	—
" " Virg. "	14 50	—
" Shellac, Orange	33	0 35

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.	1 10	—
Liq. Bismuthi	0 50	0 75
" Opii, Battley's	6 60	8 00
Lye, Concentrated	1 50	2 00
Liquorice, Solazzi	0 40	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 65	0 75
" Bichlor	0 70	0 80
" Biniodid....oz.	0 25	0 35
" Chloride	0 90	1 00
" C. Chalk	0 45	0 60
" Nit. Oxyd	0 90	1 00
Morphia, Acet	6 00	—
" Mur	6 00	7 00
" Sulph.	6 20	—
Musk, Pure grain ...oz.	21 00	
" Canton	1 00	1 20
Oil, Almonds, sweet	0 43	0 55
" " bitter	14 00	15 00
" Aniseed	4 00	4 50
" Bergamot, super.	5 70	6 50
" Carraway	4 00	4 20
" Cassia	2 50	3 00
" Castor, E. I.	0 15	0 17
" " Crystal	0 22	0 25
" " Italian	0 26	0 28
" Citronella	1 60	1 85
" Cloves, Ang.	1 00	1 10
" Cod Liver	1 55	1 60
" 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	7 00	7 50
" Wormwood, pure	5 80	50
Ointment, blue	0 65	0 70
Opium, Turkey, about	10 60	11 50
" " pulv.	13 20	13 50
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
" Chlor. te	0 40	0 45
" Nitrate	8 50	9 00
Potassium, Bromide	1 60	1 80
" Cyanide	0 65	0 75
" Iodide	3 80	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 80	—
" Howard's	1 85	1 90
" " 100 oz. case	1 75	—
" " 25 oz. tin	1 70	—
Root, Colomba	0 14	0 20
" Curcuma, grd.	0 12½	0 17
" Dandelion	0 25	0 35
" Elecampane	0 14	0 17
" Gentian	0 08	0 12½
" " pulv.	0 15	0 20
" Hellebore, pulv.	0 17	0 25
" Ipecac "	2 40	2 60
" Jalap, Vera Cruz.	1 55	2 —
" " Tampico	0 90	1 —
" Liquorice, select	0 13	0 17
" " pow'd	0 15	0 20
" Mandrake	0 20	0 25
" Orris	0 20	0 25
" Rhubarb, Turky	4 40	5 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 75	0 80
" Squills	0 10	0 15½
" Senega	0 97	1 00
" Spigelia	0 35	0 40
Sal., Epsom	3 00	4 00
" Rochelle	0 28	0 35
" Soda	0 02	0 03
Seed, Anise	0 16	0 30
" Canary	0 05	0 06
" Cardamon	3 50	4 00
" Fenugreek, gr'd	0 10	0 15
" Hemp	0 05½	0 05½
" Mustard, white	0 14	0 16
Saffron, Amer.	3 00	3 50
" Spanish	15 00	16 00
Santonine	10 50	12 00
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	5 50	—
" " 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 65	1 20
" Extract	0 28	0 35
Japonica	0 05½	0 06½
Lacdye, pow'd	0 35	0 40
Logwood	0 02 ¼	0 03

Dyestuffs—*Continued*	$ c.	$ c.
Logwood, Camp.	0 02 @	0 03½
" Extract	0 10½	0 14
" " 1lb bxs	0 14	—
" " ½lb "	0 15	--
Madder, best Dutch	0 15	0 18
" 2nd quality	0 14	0 15
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 42	0 50
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 70	0 75
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 01½
" 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 35	—
" " No. 1 "	2 10	—
" " No. 2 "	1 90	—
" " No. 3 "	1 65	—
" " Com. "	1 50	—
White Zinc, Snow	2 75	3 25
Naval Stores.		
Black Pitch	4 50 @	5 50
Rosin, Strained	3 75	4 50
" Clear, pale	5 75	10 00
Spirits Turpentine	0 52	0 60
Tar Wood	3 40	4 00
Oils.		
Cod	0 70 @	0 70
Lard, extra	1 25	—
" No. 1	1 12½	-
" No. 2	1 00	-
Linseed, Raw	0 77½	0 80
" Boiled	0 82½	0 85
Olive, Common	1 30	1 35
" Salad	1 80	2 30
" " Pints, cases	4 20	4 40
" " Quarts	3 60	3 90
Seal Oil, Pale	0 80	0 90
" " Straw	0 75	0 80
Sesame Salad	1 30	1 35
Sperm, genuine		
Whale, refined		