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A

MANUAL

OF

PHARMACY.

BY

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SECOND EDITION, CORRECTED.

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TO THE

MASTER, WARDENS,

ASSISTANTS, AND MEMBERS,

OF THE

Society of Apothecaries of London,

THE FOLLOWING PAGES

ARE RESPECTFULLY INSCRIBED,

BY THEIR FAITHFUL SERVANT,

THE AUTHOR.

London, May 28, 1829.

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PART I.

COMPRISES THE ARTICLES OF THE MATERIA MEDICA, THE LATIN NAMES OF WHICH ARE ARRANGED IN ALPHABETICAL ORDER.

PART II.

COMPRISES THE PHARMACEUTICAL PREPARATIONS AND COMPOUNDS AS DIRECTED BY THE LONDON PHARMACOPŒIA.

INTRODUCTION.

In a Manual of Chemistry, originally published in the year 1819, I have endeavoured to present the reader with a compendium of the principal facts of that science, arranged in the order in which they are discussed and illustrated in the Lectures delivered in the Laboratory of the Royal Institution. The object of the present work is to furnish the student with a corresponding outline of the Course of Pharmacy annually given at Apothecaries' Hall.

Under the term Pharmacy I include all that relates to the Medical and Chemical History of the different Articles of the Materia Medica; to the mode of prescribing them; to their effects; to their composition: these, therefore, are the subjects to which I have almost exclusively confined myself in the following pages; and, it is hoped that they will be found so treated as to facilitate the progress of the medical student in a branch of his profession generally much neglected, and often imperfectly taught in the schools.

Consistently with the plan of my Lectures, I have adopted the list of the Materia Medica, and of the Preparations and Compounds, sanctioned by the Royal College of Physicians of London, and published in

their Pharmacopœia, as the basis of this work, and have endeavoured to divest my remarks upon them of all details, except such as I conceive likely to prove practically useful.

In the compounding of Medicines TROY WEIGHT is directed to be employed by the London College: the *pound* (containing 5760 grains) is subdivided into twelve *ounces;* the *ounce* into eight *drachms;* the *drachm* into three *scruples;* the *scruple* into twenty *grains.*

℔		$\bar{\bar{3}}$		3		℈		gr.
Pound.		Ounces.		Drachms.		Scruples.		Grains.
1	=	12	=	96	=	288	=	5760
		1	=	8	=	24	=	480
				1	=	3	=	60
						1	=	20

But nearly all drugs, like other ordinary commodities, are purchased and sold by AVOIRDUPOIS WEIGHT, of which the *pound* (containing 7000 grains) is subdivided into sixteen *ounces,* and the *ounce* into sixteen *drachms.*

℔		oz.		dr.		gr.
Pound.		Ounces.		Drachms.		Grains.
1	=	16	=	256	=	7000
		1	=	16	=	437.50
				1	=	27.34

In the measurement of liquids the standard WINE GALLON (containing ten avoirdupois pounds of distilled water at the temperature of 62°) is subdivided, for medicinal purposes, into eight *pints;* the *pint* into sixteen *fluid ounces;* the

fluid ounce into eight *fluid drachms*; and the *fluid drachm* into sixty *minims*.

O.		f℥		f3		m
Gallon.		Pints.		Fluid ounces.		Fluid drachms.		Minims.
1	=	8	=	128	=	1024	=	61440
		1	=	16	=	128	=	7680
				1	=	8	=	480
						1	=	60

Temperatures are, in all instances, measured by FAHRENHEIT's thermometric scale, in which the *boiling point* of water is 212°; the *freezing point*, 32°; by the term *gentle heat*, a temperature between 90° and 100° is implied; and the *specific gravities* of bodies are assumed as taken at 55°.

MANUAL OF PHARMACY.

PART I.

MATERIA MEDICA.

ABIETIS RESINA—*The Resin of the Pinus Abies, or Spruce Fir*—the *Thus* of the old Pharmacopœia.—It is usually in softish masses, and imported from Germany, in casks of 1 to 2 cwt. each. Its only use is as an ingredient in some plaisters. It has an aromatic and terebinthine odour; a pale yellowish-brown colour, often intermixed with white streaks; and is occasionally met with in the form of rounded masses or tears, which have spontaneously exuded from and dried upon the trees.

Genuine *Burgundy pitch* is also the produce of the *pinus abies*, obtained by incision through the bark. The different portions are collected, fused in boiling water, and cleansed by pressing through canvass cloths. When genuine, it has a very peculiar odour; and although brittle in cold weather, it assumes a tenacious viscidity when gently heated, or kneaded in the warm hand. It therefore forms an excellent adhesive and gently stimulant plaister, exciting some degree of irritation, and often a slight serous exudation from the parts to which it is applied. It will remain adherent to the cuticle for a long time; and is usefully applied to the thorax in catarrhal affections, and to the loins in rheumatism and lumbago. These plaisters, independent of the cuticular irritation which they excite, are useful merely as keeping the part warm and supported. It is customary with apothecaries to keep Burgundy pitch in a small ladle, or old saucepan, and to remelt

the same portion repeatedly, by which it loses its characteristic adhesiveness and irritating quality, and is little more active than common rosin. It should always be applied fresh, and spread upon the leather with the aid of as little heat as possible.

Upon some skins a Burgundy pitch plaister, or any similar application, creates incessant itching, and excites a pimply eruption, attended by almost unbearable irritation, so that it is frequently necessary to remove it within a few hours after its application: in these instances, however, it often does great service, especially in chronic rheumatism, where it may thus prove almost as effectual as a blister.

Spurious Burgundy pitch, manufactured here, is detected chiefly by deficiency in the strong and peculiar odour and viscidity of the genuine resin.

ABSINTHIUM—*Artemisia Absinthium, or common Wormwood*, has very long had a place in the Materia Medica, but it is difficult to say why it is now retained, for although a powerful bitter, it has been generally discarded on account of its nauseous flavour*. Its bitterness is derived from what is usually called extractive matter, and is retained by the decoction after long boiling; but its aroma depends upon essential oil, which may be obtained by distillation, 1 cwt. of the fresh herb yielding upon an average 4 ounces of oil.

Wormwood is sometimes spoken of as an antispasmodic, and the older writers extol it as a vermifuge†; but it deserves little attention at the present day in either of these characters. The French are fond of it as a stomachic, and spoil some of their excellent liqueurs with its flavour; and what our publicans sell under the name of purl, is said to be ale seasoned with the tops of wormwood. Applied externally, infusion of wormwood has no advantage over warm water; it is not more discutient, and scarcely more antiseptic.

If used internally, wormwood should be fresh; and for this purpose ℥ij. of the recent plant may be infused in a pint of boiling water for four hours.

* As implied by its name from *α privative*, and *ψιτος pleasure*.

† Hence the name *wormwood*, probably a corruption of *wormwort*.

℞ Hujusce infusi f℥iss.
Spirit. Cinnamomi f℥ss.
M. ft. haustus 4tis vel 6tis horis sumendus.

ACACIÆ GUMMI—*Gum Acaciæ*, or, as it is vulgarly called, *Gum Arabic*, is a spontaneous exudation from the bark of the *acacia vera*, a native of Africa. This gum is imported, packed in casks, from Barbary and Morocco, in drops or tears, and in small fragments, of a pale straw-colour, and more or less transparent or translucent. It is frequently mixed with what is known in the trade under the name of gum Senegal, also an African product, and probably indiscriminately collected from several trees.

Gum arabic exhibits the chemical characters of pure gum. Its specific gravity is 1.4. It is tasteless, readily soluble in water, but insoluble in pure alcohol and ether. Its aqueous solution, if concentrated, is very little prone to change; if much diluted it becomes acetous when kept. This solution is decomposed by subacetate of lead, and a precipitate is formed composed of gum and oxide of lead. The alkalies and diluted acids dissolve gum without change, but the concentrated acids decompose and alter it. Nitric acid converts a portion of it into mucic or saccholactic acid. It consists of carbon, oxygen, and hydrogen.

The medical uses of gum arabic are soon told. It is nutritious to a considerable extent, and is placed among the substances termed *demulcents*. Its chief use is to suspend different insoluble substances in water; hence it is often mixed with oils, resins, gum resins, and the like. The *mucilago acaciæ* of the Pharmacopœia is made by dissolving the powdered gum in twice its weight of boiling water—a solution too thick for most purposes.

To allay the irritation excited by a cough, mixtures of mucilage and oil, or *emulsions*, are often of some service; and they may be rendered palatable, and even pleasant, by the addition of sugar and some very slight aromatic. Thus—

℞ Mucil. Acaciæ ℥j.
Olei Amygd.
Syrup. Tolutani ää f℥ss.
Aquæ Cinnam. f℥ij.
—— distillat. f℥iv.
M. fiat Mistur. cujus sumatur parum subinde.

Much has been said of the use of viscid mucilages in cases of poisoning, as a means of sheathing and protecting the alimentary canal; but they are not at all to be depended on.

ACETOSÆ FOLIA—*The Leaves of the Rumex acetosa, or common Sorrel.* This is an unnecessary incumbrance to the Materia Medica; but it forms a good article of cookery, and an excellent sauce for stewed lamb or veal.

ACETOSELLA—*The common Wood-sorrel, Oxalis acetosella*, like the former, is an acidulous plant, deriving its sourness from the presence of quadroxalate of potassa. It is neither useful in physic nor cookery; the object of retaining it, therefore, in the Materia Medica of the Pharmacopœia, is by no means obvious.

ACETUM—*Vinegar.* There are many processes, remarkably different from each other, by which vinegar may be obtained. In wine countries it is produced by the exposure of wine to the action of air and a due temperature; it is sometimes made from solutions of sugar and saccharine fruits; and in this country it is abundantly prepared from infusion of malt. In all these instances the liquids are suffered to ferment with more or less access of air, part of the oxygen of which is converted into carbonic acid, and the liquors, if originally vinous, become gradually sour, owing to the formation of vinegar, or *acetic acid.*

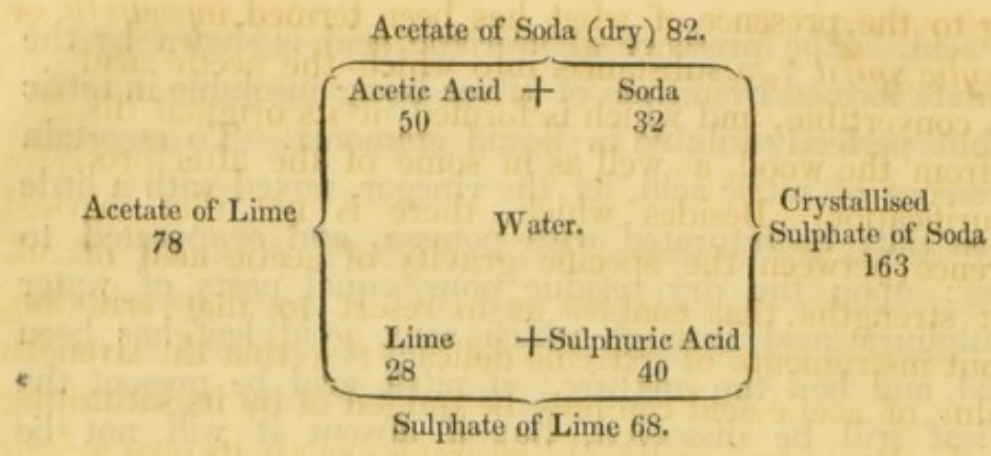
It is manifest that in all these cases the true acetic acid must not only be diluted with water, but contaminated by all the soluble matters contained in the fruit or materials employed: among these we always find colouring matter, gum, starch, and gluten, sugar, and a portion of alcohol; and frequently malic and tartaric acids, with minute portions of alkaline and earthy salts. Vinegars are also sometimes intentionally adulterated by sulphuric, muriatic, or even nitric acids. The former may be detected by the addition of acetate of baryta, which occasions a precipitate of sulphate of baryta, to be distinguished from the malate and tartrate of baryta (which also *may* be thrown down) by its insolubility in

nitric acid. The presence of muriatic acid is shewn by the precipitate formed by nitrate of silver being insoluble in nitric acid, but perfectly soluble in liquid ammonia. To ascertain the presence of nitric acid, let the vinegar, mixed with a little common salt, be saturated with potassa, and evaporated to dryness: upon the dry residue pour equal parts of water and sulphuric acid through which some gold leaf has been diffused, and boil the mixture; if nitric acid be present the gold leaf will be dissolved, but if absent it will not be acted on *.

Another mode of obtaining vinegar, now very extensively practised, consists in subjecting wood to destructive distillation in an apparatus properly constructed for the purpose †. Under these circumstances it affords a large quantity of gaseous and liquid products, the latter consisting chiefly of tar, water, and acetic acid. From this an impure acetate (pyrolignate) of lime is manufactured, which, after having been to a certain extent purified, is mixed with sulphate of soda; a double decomposition is thus effected, and sulphate of lime and acetate of soda are formed; the latter salt being very soluble is easily separated from the very difficultly soluble sulphate of lime, purified by solution and crystallisation, and decomposed in a proper distillatory apparatus, by sulphuric acid; a very pure and concentrated acetic acid passes over, and sulphate of soda remains, which is used up in the former part of the process. The following tables show the theory of these decompositions, and the affixed equivalent numbers are the weights of the respective substances required.

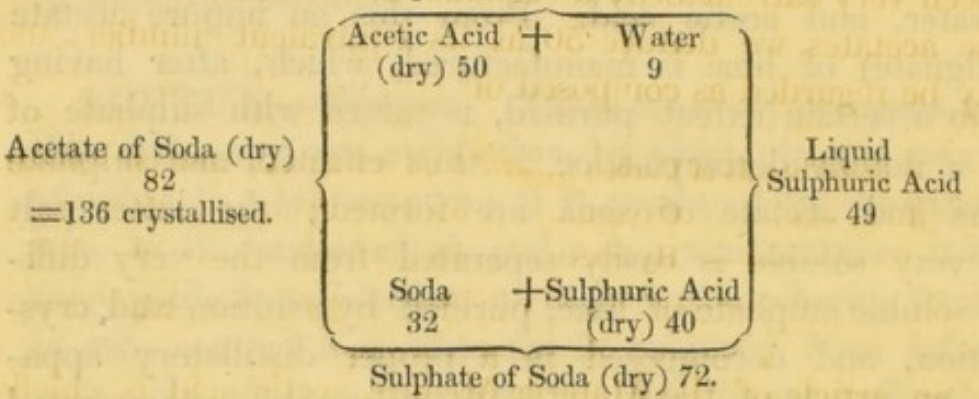
* In distilled vinegar we often find traces of copper, lead, and tin: the former is easily recognised by supersaturating with caustic ammonia, which produces a blue colour; or by the addition of prussiate of potassa, which forms a brown cloud. If vinegar hold oxide of lead in solution, it is rendered turbid by the addition of a few drops of solution of sulphate of soda, which occasions a white precipitate. If lead and copper are absent, and there should be a dark cloud occasioned by sulphuretted hydrogen, we may infer the presence of tin. These metals are generally derived from the worm or condenser of the still, which in large acetic acid manufactories should be of silver; it may be made very thin, and is not in the least acted upon by the acid.

† See Parkes' Chemical Essays.



Crystallised acetate of soda is a compound of

1	proportional of Soda.....	32
1	——————— Acetic Acid.....	50
6	——————— Water 9 × 6	54
		136



It is thus, then, by saturating any of the dilute acetic acids by a metallic oxide, and decomposing the dry acetate so obtained by sulphuric acid, that we procure pure and concentrated acetic acid. In this state it used to be called *radical vinegar*. It is a transparent, colourless, volatile, and acrid liquid, which crystallises at about 40°, and has a specific gravity of 1.060. Its vapour is inflammable. When duly diluted with water, it closely resembles distilled vinegar. The real strength of this acetic acid cannot be judged of, like that of many other acids, by a reference to its specific gravity; for samples of the same density are continually found to vary extremely in the proportion of real acid which they contain,

* This is the composition of what is sometimes known under the name of *glacial acetic acid*, in consequence of the facility with which it crystallises at temperatures below 40°.

owing to the presence of what has been termed *pyroacetic* or *pyroxylic spirit* *, a substance into which the acetic acid appears convertible, and which is formed at its original distillation from the wood, as well as in some of the after-processes of purification. Besides which, there is not that marked difference between the specific gravity of acetic acid of different strengths that enables us to resort to that criterion, without instruments of extreme delicacy; so that the strength or value of acetic acid can only be judged of by its saturating power †. Real (dry) acetic acid saturates exactly its own weight of carbonate of lime (powdered Carrara marble); or 50 parts of acetic acid are saturated by 117 of crystallised carbonate of soda. Upon either of these data the real value or strength of any sample of acetic acid is easily determined, by the rule of proportions. The ultimate composition of acetic acid has not been very satisfactorily ascertained; but from the analysis of the acetates we deduce 50 as its equivalent number, and it may be regarded as composed of

4 proportionals of Carbon	$6\times4=24$	48
3 ——————— Oxygen..... ..	$8\times3=24$	48
2 ——————— Hydrogen.....	$1\times2=2$	4
	50	100

As an article of the Materia Medica, acetic acid is chiefly valuable as a rubefacient stimulant; and as it is soluble in alcohol, and dissolves camphor, liniments of camphorated

* Pyroacetic spirit has a penetrating ethereal odour, an acrid taste, and a specific gravity, after having been distilled off muriate of lime, of 0.828. It burns with a blue flame, leaving no residue, but producing a peculiar smell. It is insoluble in water, but soluble in alcohol. When distilled with its volume of sulphuric acid, it is not altered; hence evidently distinct from alcohol, for which, however, it may be used as a substitute in lamps. According to Messrs. Macaire and Marcet, (Biblioth. Univers. October, 1823,) it consists of

Carbon	44.53
Oxygen	46.31
Hydrogen.....	9.16
	100.

It is highly stimulating and diaphoretic as a medicine.

† Taylor on the Acetometer, Quarterly Journal, VI. 255.

spirit of wine may be sharpened to any desired extent by the addition of concentrated acetic acid.

℞ Spiritûs Camphorati f℥iij.
Acidi Acetici fort. f℥j.
Misce fiant embrocatio parti affectæ applicanda.

To this any of the volatile oils may be added, for acetic acid also dissolves most of them, as we see in *aromatic vinegar* *, which is the acid thus perfumed, and furnishes an agreeable nasal stimulant. A piece of blotting paper, or cambric, moistened with pure acetic acid, and applied to the cuticle, soon excites a burning heat, with much redness; and if suffered to remain upon the spot for a sufficient time, the cuticle peels off. This forms a good occasional substitute for a blister, especially in inflammatory sore throat, where external irritation rapidly excited is often singularly effectual in alleviating the internal tumefaction and pain. It would, probably, be a good application in croup, where a very quick external counteraction is wanted. The inhalation of the vapour of acetic acid has proved a useful remedy in hoarseness arising from local irritation of the larynx and epiglottis: it may be mixed in small quantity with boiling water in an inhaler, and used in the usual way.

The vapour of acetic acid is sometimes employed for the fumigation of sick rooms, where its only use is to cover any bad smell; for it is perfectly ineffectual as a destroyer of contagious or infectious matter.

Common vinegar and acetic acid in various states of dilution forms a refreshing ingredient in diluent drinks in cases of inflammatory fever, and in those affections of the digestive and urinary organs which are attended by the appearance of *white* deposits or sand in the urine; (phosphate of lime and ammoniaco-magnesian phosphate;) but lemon and orange

* According to Dr. Paris, Henry's Aromatic Vinegar is an acetic solution of camphor and of the oils of cloves, lavender, and rosemary. A preparation of this kind, he observes, may be extemporaneously made by putting ℥j. of acetate of potass into a phial, with a few drops of some fragrant oil, and ♏ xx. of sulphuric acid. (Pharmacologia, II. 15.)—Marseilles or Thieves' Vinegar consists of camphor, volatile oils, and vinegar, and resembles the *Acetum Aromaticum* of the Edinburgh Pharmacopœia.

juice, or other acid fruits, are generally preferred. Distilled vinegar is a proper addition to lotions containing acetate of lead; diluted with rose or elderflower water, it does good in chronic ophthalmia; and with vegetable astringents it forms a good addition to gargles in relaxed uvula and superficial inflammation of the posterior fauces. A glyster of diluted vinegar is sometimes used in typhus fever, and is a useful evacuant of the lower bowels.

℞ Aceti f℥ij.
Infusi Anthemidis f℥v.
M. pro enemate.

Acetic acid has sometimes been recommended as an effectual antidote to the narcotic poisons; but the accounts which we have of its virtues in these cases are quite unsatisfactory, and the chemical history of opium and other narcotics by no means sanctions such application of this acid.

ACIDUM CITRICUM—*Crystallised Citric Acid.* This acid occurs again under the "Preparations," where the mode of obtaining it and its uses will be pointed out. It is properly inserted in the *Materia Medica* as one of those articles which are chiefly prepared upon a large scale by the manufacturer. Its average wholesale price is about eighteen shillings per lb.

ACIDUM SULPHURICUM—*Sulphuric Acid.*—"The specific gravity of this acid is to the specific gravity of distilled water as 1.850 to 1.000."

This very important acid used formerly to be obtained by the distillation of sulphate of iron, or green vitriol; hence the term *oil of vitriol.* It is now almost exclusively manufactured, in this country, according to the following process. A mixture of about 8 parts of sulphur and 1 of nitre is burnt in a capacious leaden chamber, the bottom of which is covered with water, by which the fumes are successively condensed, and which ultimately becomes very sour. When it has attained a certain specific gravity it is removed, and concentrated by evaporation, first in leaden, and afterwards in glass vessels, until it attains a due specific gravity. The fumes originally evolved by the burning sulphur and nitre appear to consist of sul-

phurous acid and nitrous acid; this mixture is absorbed and decomposed by the water in such a way that the sulphurous acid becomes sulphuric acid at the expense of the oxygen of the nitrous acid, which is reduced to nitric oxide. The sulphuric acid remains in combination with the water, but the nitric oxide is thrown off into the chamber, and again forms nitrous acid, by uniting with the oxygen of the atmospheric air; this is again ready to blend with the sulphurous acid, and to convert it into sulphuric acid as above stated. The nitrous acid, therefore, acts as a carrier of oxygen from the atmosphere to the sulphurous acid. For a more full explanation of the formation of this acid, the reader is referred to chemical works.

Sulphuric acid, as it occurs in commerce, in its purest state, is a dense, unctuous, and colourless liquid, of the specific gravity of 1.848; if heavier, it generally contains 2 or 3 *per cent.* of sulphate of potassa, which remains on the evaporation of the acid in a platinum capsule. It is caustic, and intensely sour, even when very largely diluted with water. It has a very strong attraction for water, and absorbs it rapidly from the atmosphere; hence it requires to be kept in well-stopped vessels. When mixed with water, there is a considerable elevation of temperature, accompanied by a diminution of bulk: 4 parts of acid suddenly mixed with 1 of water, at 50°, acquire a temperature of nearly 300°; hence caution is requisite in mixing the acid and water, especially in glass vessels: the acid should be added gradually to the water, and the mixture stirred after each addition. It sometimes happens that on dilution the acid acquires an opalescent appearance, and gradually deposits a white powder, which is sulphate of lead, a salt sparingly soluble in the concentrated, but insoluble in the dilute acid. On evaporating 100 parts of common sulphuric acid in a platinum capsule, there is usually a residue of about 1 *per cent.* consisting of the sulphates of potassa and of lead.

Sulphuric acid is largely consumed in the pharmaceutical laboratory. Its real strength or value may be most accurately determined by ascertaining its saturating power in regard to *dry* subcarbonate of soda, of which salt 100 grains neutralise 92 grains of pure liquid sulphuric acid. Supposing sulphuric

acid to be pure, its value or strength will be directly as its specific gravity; and the following valuable table, by Dr. Ure, shews the quantity of the liquid acid, and of real or dry acid in 100 parts, by weight, of the diluted acid at different densities.

TABLE of the quantity of Oil of Vitriol and Dry Sulphuric Acid in 100 *parts of Dilute, at different Densities, by Dr. Ure.*

Liquid.	Sp. Gr.	Dry.	Liquid.	Sp. Gr.	Dry.	Liquid.	Sp. Gr.	Dry.
100	1.8485	81.54	66	1.5503	53.82	32	1.2334	26.09
99	1.8475	80.72	65	1.5390	53.00	31	1.2260	25.28
98	1.8460	79.90	64	1.5280	52.18	30	1.2184	24.46
97	1.8439	79.09	63	1.5170	51.37	29	1.2108	23.65
96	1.8410	78.28	62	1.5066	50.55	28	1.2032	22.83
95	1.8376	77.46	61	1.4960	49.74	27	1.1956	22.01
94	1.8336	76.65	60	1.4860	48.92	26	1.1876	21.20
93	1.8290	75.83	58	1.4760	48.11	25	1.1792	20.38
92	1.8233	75.02	58	1.4660	47.29	24	1.1706	19.57
91	1.8179	74.20	57	1.4560	46.48	23	1.1626	18.75
90	1.8115	73.39	56	1.4460	45.66	22	1.1549	17.94
89	1.8043	72.57	55	1.4360	44.85	21	1.1480	17.12
88	1.7962	71.75	54	1.4265	44.03	20	1.1410	16.31
87	1.7870	70.94	53	1.4170	43.22	19	1.1330	15.49
86	1.7774	70.12	52	1.4073	42.40	18	1.1246	14.68
85	1.7673	69.31	51	1.3977	41.58	17	1.1165	13.86
84	1.7570	68.49	50	1.3884	40.77	16	1.1090	13.05
83	1.7465	67.68	49	1.3788	39.95	15	1.1019	12.23
82	1.7360	66.86	48	1.3697	39.14	14	1.0953	11.41
81	1.7245	66.05	47	1.3612	38.32	13	1.0887	10.60
80	1.7120	65.23	46	1.3530	37.51	12	1.0809	9.78
79	1.6993	64.42	45	1.3440	36.69	11	1.0743	8.97
78	1.6870	63.60	44	1.3345	35.88	10	1.0682	8.15
77	1.6750	62.78	43	1.3255	35.06	9	1.0614	7.34
76	1.6630	61.97	42	1.3165	34.25	8	1.0544	6.52
75	1.6520	61.15	41	1.3080	33.43	7	1.0477	5.71
74	1.6415	60.34	40	1.2999	32.61	6	1.0405	4.89
73	1.6321	59.52	39	1.2913	31.80	5	1.0336	4.08
72	1.6204	58.71	38	1.2826	30.98	4	1.0268	3.26
71	1.6090	57.89	37	1.2740	30.17	3	1.0206	2.446
70	1.5975	57.08	36	1.2654	29.35	2	1.0140	1.63
69	1.5868	56.26	35	1.2572	28.54	1	1.0074	0.8154
68	1.5760	55.45	34	1.2490	27.72			
67	1.5648	54.63	33	1.2409	26.91			

By the term *dry* sulphuric acid we mean the acid as it exists in combination with the salifiable bases, independent of water: by the term *liquid* sulphuric acid we mean the acid as it usually occurs, of the specific gravity of 1.848, in which

state it contains 1 proportional of dry acid = 40, and 1 of water = 9, and is represented by the equivalent 49. The *dry* acid is constituted of

1 proportional of Sulphur	....	16	 40
3 ——— ——— Oxygen	....	24	 60
		40	100

Concentrated sulphuric acid boils at about 570°, and freezes at −15°. The dilute acid of the specific gravity 1.780 freezes at 45°, and when of the specific gravity 1.790, at 32°.

The medical uses of this acid will be found under the head of "diluted sulphuric acid," in the second part of this work. In consequence of the domestic uses to which the concentrated acid is sometimes applied, cases are not very uncommon in which it has been swallowed by mistake, and in many of which it has proved fatal. The best antidote is a copious draught of chalk and water, or what is better, where it can be speedily procured, of magnesia and water. Instances have occurred, in which the concentrated acid has remained for some hours in the stomach, and has been ejected by vomiting; the patient having afterwards recovered. In these cases a very copious secretion of viscid mucus appears to have defended the parts from the immediate corrosive action of the acid.

ACONITI FOLIA—*The Leaves of the Aconitum Napellus, or Monkshood*, so called from the form of its flowers. This hardy perennial herbaceous plant is abundantly cultivated as an ornament to our gardens and shrubberies. About July it bears a spike of blue flowers.

The leaves have little taste till long chewed, when they are acrid, and somewhat bitter, producing a tingling sensation upon the tongue, followed by some tumefaction, and greatly impairing the power of taste for some hours afterwards.

The only preparation of aconite employed in physic is the extract or inspissated juice of the leaves, which, in doses, between half a grain and five grains, is said to be narcotic and diuretic; but it is much too uncertain in its effect, and too mischievous in over-doses, to be employed with safety or

satisfaction, and might, without inconvenience, be expunged from the list of the Materia Medica. Obstinate chronic rheumatism is the only disease in which it ever appears to have been useful.

ADEPS—*The Lard of the Sus Scrofa, or Hog.*—This is a very useful article in the formation of ointments, and the more tenacious and unctuous class of liniments. It combines with the fixed and volatile oils, with camphor, and with the resins. It fuses at a temperature of about 100°, and, like other varieties of fat, it appears to consist of an oil and a suet in combination, which may be imperfectly separated by pressure between folds of bibulous paper. Chevreul has called the former ingredient *elaine*, and the latter *stearine;* from the Greek words ελαιον and στεαρ, signifying oil and tallow. By long exposure to air, lard becomes rancid and sourish, and in that state acquires certain solvent and oxidating powers which it did not before possess.

ÆRUGO—*Verdigris; Impure subacetate of Copper.*—This is a very impure and consequently uncertain preparation of copper, and should be omitted in the list of Materia Medica.

If an acetate of copper be at all required, the *crystallised verdigris* should be employed; but, as far as all pharmaceutical uses are concerned, the sulphate of copper may be substituted. The London Pharmacopœia directs the old *mel Ægyptiacum*, or *oxymel æruginis*, under the title of *linimentum æruginis*, and this is certainly a useful detergent application to some ulcerating sores; but a solution of sulphate of copper in common oxymel is a preferable substitute.

Independent of the adulterations to which common verdigris is subject, there is a substance occasionally found in trade, under the name of English verdigris, which is made by triturating acetate of lead and sulphate of copper with a certain quantity of chalk and water; the mixture is dried in cakes, and grape-stalks added *ad libitum*.

According to Dr. Paris, powdered verdigris is the active ingredient in the quack medicine called *Smellome's Eye-Salve*.

ALLII RADIX—*The Root of the Allium sativum, or com-*

mon Garlic.—The ordinary properties of garlic are too well known to require any particular enumeration, and its medical qualities are not such as to detain us long; indeed, for which of its merits it is retained in the Pharmacopœia it is difficult to say. Like the other members of its family, it loses its virtues by long boiling, and if distilled affords a bitter, highly acrid, and odorous essential oil. If used with more judgment than belongs to ordinary cooks, garlic improves the flavour of a numerous class of sauces, but entirely spoils them if added in such proportions as to become prominent.

The diseases in which garlic has been praised are, obstinate agues, by Bergius; dropsical affections, by Sydenham; and in scurvy, as preventive and curative, by Dr. Lind. A boiled clove of garlic, or a garlic poultice, is a common domestic application to indolent tumours and tardily proceeding boils; it is sometimes applied to the soles of the feet to cause what is called revulsion from the head or breast; and has long been celebrated as an anthelmintic when boiled in milk. A gentleman who had suffered under a complication of what were called nervous diseases, recovered after partaking largely of a soup over-seasoned with garlic, which was followed by the evacuation of a *lumbricus teres*, evidently the cause of his distressing complaints. But this is no case in specific favour of garlic, and generally it heats and stimulates, and much aggravates the temporary fever from which all persons suffer more or less after eating more than is good for them.

As an external stimulant, the pulp or juice of garlic is not only rubefacient, but will blister the skin.

ALOES SPICATÆ EXTRACTUM—*The Extract of the Spiked Aloe, commonly called Socotrine Aloes.*—There can be little doubt that the *aloe spicata* affords a very fine variety of the aloes of commerce, of which that imported from the Cape of Good Hope may be taken as a sample; but it is equally clear that the aloes met with in trade is of very different qualities, and although all the better kinds bear the name of Socotrine aloes, that they were never near the island whence it is professed they come.

The fact is, that the greater part of the aloes we meet with

is imported from Bombay, and not unfrequently remelted in this country, with a view of improving its tint and odour, and sometimes of deteriorating its quality by the addition of common rosin, a fraud easily detected by the insolubility of such adulterated aloes in boiling water: it is probably the inspissated juice or extract of several varieties of aloe; at all events, different samples differ remarkably in appearance and character.

The finest aloes, that, for instance, of the island of Socotorah, and some of that prepared at the Cape, has a brilliant reddish-brown colour, and is very translucent at the edges of the fragmented pieces: its fracture is smooth and conchoidal, its odour aromatic and rather agreeable, its powder deep gold colour, its taste intensely bitter and nauseous. But such is rarely found at the druggists'; there it is more opaque, of a dull brown, often passing into black, of an odour generally decidedly disagreeable, and of a taste more than ordinarily nauseous. It is, however, scarcely necessary to enter at length into a description of these varieties of aloes, since their medical virtues do not seem to be essentially different; and accordingly we may select for pharmaceutical use that which has the least unpleasant odour, and which, at the same time, seems to have suffered least from heat in its manufacture, and which remains translucent.

Aloes appears to be a mixture of gum, extractive, and resin, but whether its activity resides in one or all of these components has not been ascertained; nor, indeed, has much light been thrown upon its composition by those who have particularly examined it: it is nearly entirely soluble in boiling water, but, as the solution cools, some resin and altered extractive are thrown down; the alkalies and their carbonates form with it permanent solutions, and proof-spirit dissolves and retains it with only a slight precipitation of resin.

The medical qualities of aloes are such as give it a place of its own in the Materia Medica. It is a warm stimulating purgative; its action is chiefly upon the large intestines, of which it singularly promotes the evacuation, probably by increasing the muscular or peristaltic action rather than by augmenting their secretions, for it rarely pro-

duces liquid motions. It generally sits well upon the stomach, and its bitterness promotes appetite and digestion; when in the small intestines it creates little alarm, and is seldom perceived till the sigmoid flexure of the colon feels its influence, the peristaltic movements of which are often perceptibly increased to the sensations of the patient, and then the rectum is quietly emptied.

Much has been said of the mischief done by aloes in irritating the rectum, and no doubt it is liable to create excitement there, but this is only where it is frequently used, and in cases of habitual costiveness all other purgatives are open to the same objection. Sedentary, studious, and idle persons, and more especially females in the higher classes of society, resort to purgatives to obtain that regularity of intestinal evacuation which bodily exertion and due exercise only will insure; and aloes, in consequence of its moderate, but at the same time certain operation, is among the usual remedies thus erroneously employed; whence a portion of the ill fame which it has acquired as especially productive of piles and uterine and rectal irritation.

In all cold indolent habits, where costiveness is attended by general sluggishness of the circulating system, with loss of appetite, irritability of temper, with disinclination both to mental and bodily exertion, and other symptoms of the milder hypochondriasis; where there is dyspepsia in females, blended with the disorders which arise from irregularity and inertness in the uterine system, aloes, in one or other of the forms I shall presently mention, is a valuable and safe remedy; and it is by far the most certain and secure substance for the relief of that temporary, but often obstinate and injurious costiveness, which usually follows the exhibition of opium.

But there are cases in which aloetics are hurtful, and, to use a medical phrase, in which they are decidedly contra-indicated. Such, for instance, are plethoric and irritable habits subject to hæmorrhoidal affections, or to excessive uterine evacuations.

The dose of aloes may vary from two to ten or fifteen grains; about five grains will usually evacuate the bowels in one or two bulky motions, but it is seldom that we give aloes

alone, and under some of the aloetic formulæ of the Pharmacopœia, we shall again take occasion to speak of its most common combinations.

The following pills are useful for obviating costiveness in dyspeptic habits, but they should not be kept too long in a dry place, as they are apt to become hard, and so insoluble as to pass through the bowels,—an inconvenience which may to a great extent be remedied by the addition to the mass of about a fourth part of sugar or of soap.

℞ Pulveris Aloës,
———Mastiche,
———Rhæi, āā 3ss.
Aquæ, q. s. ut fiant massa in pilulas xx. dividenda, quarum sumantur duæ vel tres ante prandium.

The time for taking these pills is immediately before dinner; they then blend with the food, prevent flatulency, and are usually found to be operative the following morning after breakfast.

ALOES VULGARIS EXTRACTUM—*Extract of the common Aloe; Barbadoes Aloes.*—This kind of aloes is prepared in Barbadoes, and exported thence in large gourds, which contain upwards of half a hundred weight each.

It is generally deeper-coloured and more opaque than the former, its consistence is tougher, its fracture less shining, and its odour strong and peculiarly disagreeable; the colour of its powder is dirty yellow, and it is said to be more active than Socotrine aloes; and hence, though its price usually exceeds that of the other varieties, it is much preferred in the preparation of horse medicines, a channel by which enormous quantities of aloes are consumed.

ALTHEÆ FOLIA ET RADIX—*The leaves and root of the Althea Officinalis, or Marsh-Mallow.*—The decoction of the marsh-mallow is a viscid mucilaginous liquid, sometimes used as a demulcent drink, but having nothing to recommend it in preference to barley-water, solution of gum arabic, and other more attainable diluents of the same nature.

ALUMEN—*Alum; Sulphate of Alumina and Potassa.*—

This salt crystallises in octoedra, and is soluble in 5 parts of water at 60°; its taste is sweet, astringent, and acidulous, and it reddens vegetable blues. As an article of the Materia Medica, it ranks with the more powerful astringents, and as such it is sometimes, though rarely, employed internally, in doses of from 5 to 15 grains, conjoined with some aromatic; but it is apt to gripe and nauseate when large doses are frequently repeated. The diseases in which it has been thus administered are agues, internal hæmorrhages, and gleets; in the latter, alum-whey has sometimes proved serviceable, which may be prepared as follows—

℞ Lactis Vaccini bullientis oct. j.
Aluminis Contriti ʒij.
Ebulliant simul ut fiat coagulum, coletur serum, et sumatur cyathus subinde.

Or, alum may be given in pills, as follows—

℞ Aluminis Contriti,
Pulv. Cinnam. Compos. āā ʒss.
Confectionis Rosæ Gallicæ q. s. ut fiat massa in pilulas xviij. dividenda; ij. vel iij. pro dosi.

Externally applied, alum is useful in chronic ophthalmia and in gleets, and forms a good addition to gargles in relaxed uvula.

The following are formulæ for an aluminous collyrium and gargle—

℞ Aluminis gr. vj. Solve in
Aquæ Rosæ f℥iv. ut fiat collyrium.

℞ Aluminis ℈j.
Aquæ Rosæ f℥iv.
Tinctur. Cardam. Compos. fʒij.
Mellis Despumati fʒvj.
M. fiat gargarisma sæpe utendum.

A saturated solution of alum is recommended by Dr. Scudamore as a remarkably efficacious styptic *. One ounce of water holds about 30 grains of alum in permanent solution.

What is termed *alum curd* is sometimes used as an astringent and cooling external application. It is made by agitating the white of egg with a lump of alum till it forms a soft coagulum.

* Essay on the Blood, p. 155.

When alum is exposed to heat it undergoes fusion in its water of crystallisation, which being evaporated, the dry salt remains in the form of a light porous mass, formerly called *burnt alum, alumen ustum;* it is the *alumen exsiccatum* of the Pharmacopœia. By this process alum loses about 40 per cent. of its weight, provided too much heat has not been employed, in which last case a portion of the acid of the salt is also volatilized, but the whole cannot be thus driven off.

Dried alum is chiefly used as an external styptic; it has been recommended in doses of 20 grains, in cholica pictonum, but it seems of doubtful propriety in that disease.

Alum, according to Mr. R. Phillips, is composed of

Sulphuric acid	34.94
Alumina	11.18
Potassa	10.33
Water	43.55
	100.

Besides the above, which may be called potassa-alum, a triple salt may be formed with ammonia and with soda, but these compounds have nothing to do with pharmacy.

AMMONIACUM—A gum resin, supposed, but upon very doubtful evidence, to be the produce of a species of Heracleum, called by Willdenow *Heracleum gummiferum*, a native of Africa and of the East Indies, whence the finest is imported into Europe, either in separate drops, or in cakes and masses which appear to consist of the tears agglutinated. That which is decidedly guttiform, of a clean and deep buff-colour externally, paler within, and free from impurities, is most esteemed. Ammoniacum has little smell, but its taste is bitter, nauseous, and somewhat pungent. In warm weather it is of a very tough and unmanageable consistence, but in lower temperatures it becomes brittle, and it may be powdered and sifted in frosty weather, which is a better mode of freeing it from mixed impurities, than straining it when softened by boiling water. The powdered ammoniacum should be packed up in small oblong parcels, as it will afterwards again agglutinate. The chemical characters of ammoniacum are those of a gum resin; it is imperfectly soluble in water and in

alcohol; but triturated with the former, the soluble gummy portion suspends the resin, and the mixture is tolerably permanent.

Ammoniacum is placed by systematic writers on the Materia Medica among the stimulating expectorants; antispasmodic virtues are also ascribed to it: but, independent of other aids, little reliance can be placed in the use of ammoniacum as fulfilling such character, and this remedy is chiefly useful in combination with, or as a vehicle for more powerful and certain medicines. In the coughs to which aged persons are sometimes subject, unattended by inflammatory action, and characterised by the secretion of viscid mucus in the bronchiæ, with difficult expectoration and some degree of spasmodic action, ten grains of ammoniacum three times a day seems to have proved of service in allaying spasm and facilitating the evacuation of the mucous matter. The *mistura ammoniaci* of the Pharmacopœia may also be used in doses of from half an ounce to an ounce in cases of this kind; and in females where it is desired to increase the activity of the uterine system, as well as to fulfil the other above-mentioned indications, a draught composed of f3vj. of the *mistura ammoniaci*, with the same quantity of penny-royal water, may not be improperly administered. "In that peculiar state of the bowels often accompanying hypochondriasis and dyspepsia, in which there is an almost constant degree of cholic, particularly after taking food, and which appears to arise from a viscid mucus lodged in the intestines, a combination of ammoniacum and rhubarb is singularly efficacious *."

Ammoniacum softened with vinegar forms a good adhesive and slightly stimulating plaister; it should be applied as soft as possible, for it soon hardens, and adheres long and firmly to the part.

The *emplastrum ammoniaci* of the Pharmacopœia is a preparation of this kind; and the *emplastrum ammoniaci cum hydrargyro* another, supposed to derive alterative and discutient virtues from the mercury which it contains, and hence recommended as an application to hard and indolent glandular tumours.

* Thomson's London Dispensatory, 1822, p. 325.

AMMONIÆ MURIAS.—*Muriate of Ammonia.*—We have little to say of this salt as an abstract article of the Materia Medica, but its uses in the pharmaceutical laboratory are numerous and important. It consists exclusive of water of crystallisation, of 17 ammonia united to 37 muriatic acid, or *per cent.* of 31.5 ammonia and 68.5 muriatic acid, proportions corresponding to equal volumes of muriatic and ammoniacal gases, which upon mixture are entirely condensed into solid muriate of ammonia.

The manufacture of sal ammoniac is now extensively carried on in this country. Refuse animal matters, chiefly bones from which fat and glue have been extracted, are subjected to destructive distillation. The ammoniacal liquor which they afford is saturated with sulphuric acid, and the sulphate of ammonia thus obtained decomposed by mixture with common salt and sublimation: cakes of muriate of ammonia, having the shape of the subliming vessel, are thus obtained. They should be semi-transparent, and colourless, but are often tinged brown by iron. Much of this salt is also manufactured from the ammoniacal liquor of gas-works.

Three parts of water at 60° dissolve 1 part of powdered sal ammoniac, and at 212° water takes up at least its own weight, part of which it again deposits on cooling, in dendritic crystals.

Muriate of ammonia is now never used internally; dissolved in lotions it forms a good stimulating discutient, and if mixed with its weight of powdered nitre and dissolved in 6 or 8 parts of water, it produces a very cold lotion, which may sometimes be conveniently used as a substitute for ice.

AMYGDALA AMARA } *Varieties of the Amygdalus*
——————— DULCIS }

communis—Bitter and Sweet Almonds.—Both these kernels agree in containing albumen, mucilage, and a considerable proportion of a bland, insipid, and inert oil (amounting to between 45 and 50 *per cent.*), easily obtained by expression; but to these ingredients there is superadded in the bitter almond a principle which gives it its peculiar flavour, and which may be obtained by distillation with water; it then appears as a volatile oil, generally heavier than water, having

the concentrated odour of the bitter almond, and partaking of some of the chemical properties of the hydrocyanic acid. It is this ingredient which renders bitter almonds intensely poisonous to some animals, and not unfrequently they produce deleterious effects upon the human system.

The distilled oil is virulently active, and the symptoms attendant on poisoning by it are in some respects marked and peculiar. They have been thus enumerated by Dr. Granville*:—"Stupor and numbness, with oppression and a sense of weight at the summit of the head; yawning and an irresistible disposition to sleep; vertigo and dizziness of sight. All or any of these preliminary symptoms, according to the quantity of the poison taken, are generally observed by the practitioner, if sent for in time. The pulse is found to be rather strong at first, but flags soon after, and becomes either frequent, wiry, and small, or slow and vibrating. A paralytic state of the extremities is next remarked, the pupil remains unalterably dilated, the sensibility of the organs of sense is greatly diminished. Every animal function seems impaired, except respiration, which is very rarely indeed accelerated or difficult. Vomiting and hiccup shortly precede the aggravation of every nervous symptom, when life ebbs fast, and becomes at last extinct."

From Mr. Brodie's experiments to ascertain the mode in which death is immediately produced by this and analogous poisons, it would appear that they operate upon the nervous system; that through the medium of the nerves the influence of the poison is conveyed to the brain, the functions of which are more or less impaired; that the organs of respiration are thus secondarily affected, but that the action of the heart continues for a long time unimpaired, circulating venous blood: hence, if respiration be artificially performed, so as to aërate the blood, it sometimes happens that the animal permanently recovers. Upon these subjects the reader is referred to Mr. Brodie's papers in the Philosophical Transactions, and to Orfila's Traité des Poisons.

Essential oil of bitter almonds is largely prepared for the use of perfumers, confectioners, and cooks, who generally use

* Treatise on Prussic Acid, 1820, p. 89.

what is called the essence of almonds, or a solution of ʒij. of the oil in ʒvj. of alcohol; this is also the most convenient form for its pharmaceutical employment. One hundred weight of the bitter almond cake remaining in the press after the separation of the fixed oil, is put into the still with about 400 gallons of water, this large proportion being necessary to prevent the formation of a mucilaginous magma, from which the volatile oil will not pass off, and which often, if brought to boil, rises up into the head and worm of the still. The produce of oil is liable to much variation, 1 cwt. of cake yielding from 2 ounces to $2\frac{3}{4}$ by weight. It often deposits a considerable portion of white crystallised matter, which is apparently a peculiar vegetable compound*. The oil appears to be composed of hydrocyanic acid in union with volatile oil. By digesting red oxide of mercury in it, Mr. Hennell obtained cyanuret of mercury, from which pure hydrocyanic acid was as usual procured by distilling it with muriatic acid.

The cases in which it has been proposed to administer this oil, are those in which the diluted hydrocyanic acid has been recommended, and of which a full account will be found in Dr. Granville's "Historical and Practical Treatise." Affections of the lungs, preceding or connected with phthisis; coughs of a spasmodic character, and especially whooping cough; an irritable state of the nervous system; asthmatic complaints, and some cases of local irritation; are the principal diseases in which it has been found useful, and it may be administered with camphor and other antispasmodics.

There is so much difference in the strength of the diluted hydrocyanic acid usually sold for medical use, that it is difficult to state any precise dose in which it may be administered. That made at Apothecaries' Hall has a specific gravity of 995, and contains 3.2 *per cent.* of real acid: upon this subject, Dr. Ure's observations in the Quarterly Journal † may be consulted with advantage. From 1 to 10 or 12 minims of such diluted acid may be regarded as the limits of its dose, but it is right to commence its use with caution, and gradually to increase the quantity given until an effect is observed.

The action of this acid, as well as of the volatile oil of

* Quarterly Journal, vol. xv. p. 376.

† Vol. xiii. p. 313.

almonds, depends much upon its state of concentration: of the latter, from 1 to 8 drops or minims in an ounce or an ounce and a half of any proper vehicle may generally be safely given. If sense of faintness, attended by nausea, chills, giddiness, or dimness of sight, should ensue, the dose must be diminished. Among others, the following formulæ for the exhibition of oil of bitter almonds may be used—

℞ Olei Essent. Amygd. Amar. ℥viij.
Mucilaginis Arabici. ℥ij.
Misturæ Camphoræ f℥vj.
M. fiat mistura, de qua sumantur cochlear. duo ampla bis vel ter die.

The hydrocyanic acid, or the essential oil of almonds, may be added to the mixture prescribed at page 4, in cases of cough and catarrhal irritation of the larynx.

Sweet almonds, triturated into a paste with sugar and a little water or mucilage, as directed for the *confectio amygdalarum* of the Pharmacopœia, and afterwards properly diluted and strained, as in the *mistura amygdalarum*, furnish a pleasant emulsion which may be used merely as a diluent drink, or as a vehicle for active remedies. In warm weather it becomes sour in the course of twenty-four hours, and should therefore always be used fresh.

The expressed oil of almonds in the formula above referred to furnishes an elegant emulsion, and its tastelessness recommends it in preference to olive oil. With the alkalies it forms a soapy mixture which may be substituted for emulsion, or which sometimes, with an increased quantity of alkali, is used in renal and urinary irritation, especially that arising from uric sand.

℞ Olei Amygdalarum f℥ss.
Aquæ Rosæ f℥ij.
Liquoris Potassæ f℥j. Misceantur agitatione, et adde
Syrupi Simplicis f℥ss.
Aquæ Distillatæ f℥v.
M. fiat mistura, de qua sumantur f℥ij. pro dosi.

In cases of catarrh, with hoarseness, f℥iss. of liquor ammoniæ is sometimes substituted in the above mixture for the solution of potassa.

AMYLUM—*The Starch of Wheat.*—When wheat, swollen and softened by steeping in water, is subjected to pressure, the milky juice which exudes, being diffused through water, deposits a fine impalpable powder, which, when duly washed, and carefully dried, splits into columnar masses, known as common starch. It has usually a yellowish hue, which is covered in the starch of commerce by the addition of smalt, or, as in Hall's patent process, is removed by the action of chlorine. For medical use, however, the pure and genuine starch should be used, its colour being unimportant. Starch is marked by well-defined chemical characters. It is insoluble in cold water, but readily dissolves in water at 160°, and at 180° it forms a thick jelly, which in warm weather soon liquefies and becomes mouldy, sour, and very fetid. The diluted jelly of starch is copiously precipitated by subacetate of lead, and when solution of iodine is added to it, a very characteristic blue compound is immediately formed.

Starch which has been heated till it acquires a pale brown colour, loses its peculiarities, and is converted into a substance soluble in cold water, not precipitable by iodine, and having the leading chemical characters of gum.

Starch is a very nutritious article of food, and exists abundantly in the greater number of esculent grains and roots. A warm solution of starch is often employed as a vehicle for opium and other sedatives, when administered in the form of enema. For this purpose the *mucilago amyli* is directed in the Pharmacopœia.

Several substances agreeing in essential characters with the starch of wheat, have long been used as common articles of food, especially in the diet of invalids. One of the commonest and most pleasant of these is arrow-root, which professes to be the fecula of the root of the *maranta arundinacea*, but for which potatoe starch is, it is said, often substituted. Good arrow-root should be free from all musty flavour, white, insipid, and form a consistent jelly when dissolved in eight parts of boiling water. Sago is obtained from the pith of several species of palm, and is granulated by passing it, when half dry, through a coarse sieve. Tapioca and cassava are procured from the root of the *iatropha manihat:* Salep from the bulbs of the *orchis mascula*. There are

a variety of other amylaceous preparations used in different parts of the world as articles of food.

ANETHI SEMINA—*Dill Seed—the Seed of the Anethum graveolens.*—These seeds have a warm and pungent flavour, something resembling that of carraways, and are sometimes administered in the form of powder, as a carminative for infants. They derive their aromatic character from an essential oil, which they yield in the proportion of about 2℔ from 1 cwt. Distilled with water they afford the *aqua anethi* or dill-water of the Pharmacopœia, which is a convenient and effective substitute for the powder of the seeds, and, in doses of a tea-spoonful to a table-spoonful, seldom fails to relieve the flatulency of stomach to which young infants are subject, and which is often attended by hiccup and other distressing symptoms.

Dill seed should be chosen of a fresh and bright colour, heavy, and of an agreeably aromatic odour. That which is dull, light, inodorous, or musty, should be rejected.

ANISI SEMINA—*Aniseed—the Seed of the Pimpinella Anisum.*—The taste of aniseed is warm and sweet; it should be free from mustiness, and, when rubbed in the hands, exhale its peculiar aromatic odour. The small and more compact seed, imported from Spain, is usually preferred to the lighter and larger kind, which is the growth of this country. By distillation it affords a volatile oil, which is obtained in the proportion of from ℔j. ℥ijss to ℔ijss. from 1 cwt. of seed. But the produce of oil is very variable, and, generally speaking, it is imported for pharmaceutical use from Spain. At about 50° this oil concretes, and as this is a leading character it should be attended to in its purchase. It is said that spermaceti is sometimes added to increase its tendency to congeal; a fraud which I have never met with, and which would easily be detected by the action of cold alcohol, which would dissolve the oil and leave the adulteration; or simply by evaporation. Oil of aniseed, and spirit of aniseed, or spirituous liquors flavoured with it, are often used as stomachics and carminatives; in these respects, however, it is of very little use as an article of the Materia Medica. The great consumption of

foreign oil of aniseed seems to be in the preparation of horse medicines.

ANTHEMIDIS FLORES—*Chamomile Flowers—the single Flowers of the Anthemis nobilis.*—The market is chiefly supplied with chamomile flowers by the cultivators of physical herbs; and they are met with of very different qualities. They should be selected fresh, and should strongly exhale their peculiar fragrancy when rubbed. The large white flowers are generally preferred to the smaller kinds, which become brown in drying.

Chamomile flowers have long been celebrated as an aromatic bitter; they derive their aroma from essential oil, of which about ℥jss. is obtained from 1 cwt., but the produce is very variable. Their bitterness resides in extractive matter; and as the oil is dissipated during boiling, the *extractum anthemidis* of the Pharmacopœia is merely a simple bitter, but a very good one. The *infusum anthemidis* of the Pharmacopœia, commonly known under the name of chamomile tea, partakes both of the aroma and bitterness, and, when taken strong and warm, proves nauseating and emetic, and is an excellent and ordinary auxiliary in emptying the stomach of its contents. A small tea-cupful of cold chamomile tea taken in the morning, fasting, is often serviceable in dyspeptic affections and intestinal debility. It is also a good vehicle for acids or alkalies. Chamomile flowers in powder were at one time employed in the cure of intermittents, but are now scarcely used in any case, the requisite dose of ʒij. or ʒj. being very bulky; the best form for its administration is, perhaps, as an electuary *. Decoction and infusion of chamomile flowers are often used externally as fomentations, but are little preferable to hot or warm water, excepting that the infused flowers, rolled up in a cloth or flannel, serve to retain the heat of the application.

ANTIMONII SULPHURETUM—*Sulphuret of Anti-*

* Dr. Heberden says, that the following taken every night in powder, or in pills, proves signally useful in the relief of flatulence and eructations:—half a scruple of powder of chamomile flowers, three grains of long pepper, and one of aloes.—*Commentaries.*

mony—ANTIMONII VITRUM—*Glass of Antimony—Vitrified Sulphuretted Oxide of Antimony.*—Sulphuret of Antimony is an abundant natural product, and occurs in most mining districts. It is met with in commerce in cakes or loaves, which have been fused, and exhibit a brilliant steel-grey and radiated or fibrous crystalline texture when broken. In this state it is chiefly imported from Germany and Holland, often contaminated by lead, iron, and arsenic. If lead be present in any quantity, the texture of the cakes is foliated and indistinctly striated; iron is recognised by the brown colour produced by deflagration with nitre; and arsenic by its peculiar odour during volatilisation. Exposed to the joint action of a dull red heat and air, the greater portion of the sulphur may be burnt off, and the antimony becomes protoxidised; a slight increase of heat fuses this protoxide, a portion being at the same time volatilised, and the substance on cooling concretes into a reddish-brown vitreous mass, known and imported under the name of *glass of antimony.* It is a protoxide combined with a variable proportion, generally about one-tenth, of sulphuret, and is a very useful article in the pharmaceutical laboratory. In considering the antimonial preparations of the Pharmocopœia, we shall have occasion again to advert to this subject.

Pure sulphuret of Antimony consists of

Antimony	45	.....	73.8
Sulphur	16	.....	26.2
	61		100.

It has long been discontinued as an internal remedy, except in a few nostrums for rheumatism and gout. It is apt, in some cases, to excite excessive vomiting and purging; and in others it is inert; its activity apparently depending upon the substances it meets with in the stomach and bowels.

ARGENTUM—*Refined Silver.*—This stands in the list of the Materia Medica, as the source of nitrate of silver. The metal, when pure, is entirely soluble in about its own weight of pure nitric acid, diluted with two parts of water. The solution is milky if the acid contain any trace of muriatic acid, and there is generally a small portion of residuary insoluble

black powder, which is gold. If copper be present, the solution has a blue tinge, otherwise it is colourless. Silver leaf is sometimes used as a covering of pills, which in that state may be swallowed without being tasted.

ARMORACIÆ RADIX—*The Root of the Cochlearia Armoracia, or Horse Radish.*—The qualities of horse radish are too well known to need description, and its medical uses too insignificant to require any. The London Pharmacopœia directs a compound spirit, and a compound infusion of horse radish, neither of which are used. The latter very soon spoils and putrifies.

ARSENICI OXYDUM—*White Oxide of Arsenic—Arsenious Acid.*—It is impossible too strongly to represent the evil of which the retention of arsenic in the Pharmacopœia is productive. To this alone nearly all the mischievous applications of this virulent poison are to be attributed, for its sale is thus facilitated; and as long as its unlicensed use is permitted for medical purposes, so long will it be the prevailing instrument of self-destruction and murder. Nor are there any plausible grounds upon which its employment in pharmacy can be sanctioned or defended; for there can be little doubt that more harm than benefit has resulted from its administration; and the diseases in the cure of which it has been supposed effective, admit in all cases of safer and more effectual treatment. But even allowing that in some few and anomalous instances of disease it may have proved decidedly serviceable, this is not sufficient to counterpoise the daily evils to which its present commercial circulation gives rise, or to warrant the permission of the unshackled sale of an article of such certain and deadly virulence. The other applications of arsenic, as a poison, for instance, for vermin, a cure for the dry rot, a means to prevent disease in wheat, and its employment in veterinary surgery, are of such obviously hurtful and dangerous tendency, that the propriety of discontinuing them cannot admit of two opinions; for it is thus that arsenic finds its way into culinary vessels, that it gets accidentally mixed with articles of food, that bottles which have contained it are used for beer, wine, vinegar, or medicine; and, in short, that numerous opportu-

nities are afforded to the evil-minded of possessing themselves without suspicion of this deadly weapon, and to the ignorant and careless of causing the most disastrous and distressing accidents upon record.

White arsenic has been used internally as a tonic, principally in the cure of agues; externally it has been occasionally applied to all kinds of ill-conditioned ulcerating sores, and is used in both ways in obstinate cutaneous eruptions; but in all cases it is very uncertain in its effects, and always hurtful if persevered in for any length of time. It has also been employed in some spasmodic affections, in tetanus, and chorea, but here its superiority to many other remedies is very equivocal. The only admissible form for internal exhibition is the *liquor arsenicalis* of the Pharmacopœia, or some analogous *solution;* no attempt should ever be made to administer it in substance, and it should be discontinued unless some decided advantage follow the first few doses. Of the *liquor arsenicalis* each fluid ounce contains 4 grains of white arsenic; the fluid drachm, therefore, contains half a grain; but of this, more than a fourth part, or one-eighth of a grain, should not be given as an incipient dose. It is best administered in some simple aromatic water, as—

℞ Liquoris Arsenicalis ℥xv.
Aquæ Cinnam.
—— Distillatæ āā f℥ss.
M. fiat haustus quartâ quâque horâ sumendus.

It is said that the Indians are in the habit of administering arsenic in large doses, after the bites of venomous animals; and it would appear, from Mr. Ireland's observations, that it is sometimes an effective remedy *.

The arsenical solutions, ointments, and plaisters, which have been advised for external use, should on all accounts be employed with the utmost circumspection; violent local irritation and inflammation sometimes follow the first application; and sometimes the arsenic is absorbed, and the patient's health permanently impaired by their frequent or long continued use. Upon the whole, I must again press upon the attention of those whom it concerns the necessity of rejecting

* Med. Chir. Trans. ii. 393.

arsenic from the Pharmacopœia, and from medical practice; some effective restriction or prohibition might then be laid upon its sale, and the fatal effects so continually resulting from its improper employment would probably be of infinitely rarer occurrence.

It may now be right to add a few words respecting the nature and properties of white arsenic, and of the means of detecting it by tests and re-agents. In relation to these, however, I shall be very brief, for arsenic is very easily recognized, even when in very small quantities; and the refined minutiæ of analysis which are recommended and dwelt upon by some medical writers, are in all cases liable to equivocal results, and too often mislead the unskilful and inexperienced. I allude to those cases where no arsenic in substance has any where been discovered, and where it is advised to digest the coats of the stomach and the intestines, and the contents found in them, in water, in alkaline solutions, &c., for the purpose of detecting traces of the poison.

What is called in commerce *white arsenic*, is a brittle white substance, more or less translucent, and generally met with in cakes or their fragments, retaining the shape of the vessel in which the substance has been sublimed: sometimes it has a yellow or reddish tinge, derived from iron, sulphur, and other impurities; hence the direction in the Pharmacopœia for its resublimation, by which it is often obtained in vitreous transparent cakes, which, however, soon grow opaque and crumble. Its specific gravity is 3.72. Sometimes it is sold in powder, and is then said to be liable to adulteration with chalk and gypsum, a fraud easily detected by the imperfect volatility of the powder thus adulterated. The temperature at which this substance rises in vapour is between 380° and 400°, and, as has been shewn by Dr. Paris, it exhales no odour when perfectly free from metallic arsenic, though if heated in the flame of a candle, or in contact with almost any other inflammable matter, it smells strongly of garlic in consequence of its partial reduction. The solubility of white arsenic in water has not been very accurately determined, but I believe Klaproth's statement not far from correct. He found that 1000 grains of water at 60° left for 24 hours upon a portion of arsenic, with which it was often agitated, took up 2½

grains; 1000 grains of water boiled upon arsenic dissolved 77¾ grains, and this solution, after standing three days, deposited a portion of its contents in the form of crystals, but retained 30 grains in permanent solution; a fact which, as Dr. Paris justly observes, shews the importance of employing boiling water in every chemical examination of substances supposed to contain arsenic. White arsenic is sparingly soluble in alcohol, in ether, and in fixed and volatile oils. Its aqueous solution has a peculiarly nauseous, acrid, and astringent taste, which, when once experienced, will scarcely be forgotten: it reddens some vegetable blues, such, for instance, as litmus; but it renders the blue of violets and of some other flowers green. It dissolves in the alkalies, and forms compounds with the metallic oxides generally; hence the term *arsenious acid* applied to it. When exposed, with charcoal, to heat under pressure, or when combined with potassa and heated with charcoal, as in the case of fusing it in a glass tube with black flux, it is decomposed, and a brilliant steel-grey sublimate of metallic arsenic is obtained, white arsenic being composed of 100 metal and 34 oxygen, or of

Arsenic	74.6
Oxygen	25.4
	100.

If nitric acid be repeatedly distilled off white arsenic, it acquires an additional proportion of oxygen, and is converted into *arsenic acid*, a substance very soluble in water, very sour, and saturating the alkalies and metallic oxides, so as to produce distinct neutral salts, some of which, especially the bin-arseniate of potassa, have been proposed for medical use; but the arsenite of potassa (liquor arsenicalis) is equally effectual, and we should studiously avoid multiplying these pernicious compounds. Arsenic acid is virulently poisonous. It consists of

Arsenic	61.
Oxygen	39.
	100.

There now remain for discussion three important points in the pharmaceutical history of white arsenic, namely—the

chemical means of detecting its presence by tests or re-agents; the symptoms which it produces when taken in mischievous quantity; and the method of treatment which such cases require.

I have already remarked that arsenic, even in very minute quantity, is not difficult of discovery. The suspected substance should be boiled in as small a portion of distilled water as convenient, the solution filtered, and a portion of it put into three test tubes, *a*, *b*, and *c*. To *a* add a drop or two of solution of potassa, and then a similar quantity of solution of sulphate of copper: an *apple-green* precipitate indicates arsenic; if the precipitate be sky-blue, no arsenic is present.

To the liquid *b* add a drop or two of solution of ammonia, and then the same quantity of nitrate of silver; if white arsenic be present, a yellow precipitate is formed; if not, there is no change, or only a white cloudiness *.

To *c* add a drop or two of liquid potassa, evaporate to dryness, and having added a morsel of wax, heat the residue to redness. Metallic arsenic will sublime, and the garlic smell will be very perceptible upon opening the lower end of the tube and holding it inclined so that a current of air may pass through it.

The precipitates from *a* and *b*, heated with a little wax, should give similar indications of metallic arsenic.

Of the above tests, the first was contrived by Scheele, and

* Another mode of applying this test, suggested also by Mr. Hume, consists in adding to the aqueous solution of white arsenic a drop or two of an ammonia-nitrate of silver, formed by dropping liquid ammonia into a solution of one part of nitrate of silver in ten of water, until the precipitate first formed is almost entirely redissolved by agitation. It is necessary to be a little cautious in this instance, lest fulminating silver should be formed.

Dr. Paris recommends the application of this test upon writing paper, instead of glasses: "drop the suspected fluid on a piece of white paper, making with it a broad line; along this line a stick of lunar caustic is to be drawn several times successively, when a streak is produced of a colour resembling that known under the name of *Indian yellow*." This yellow remains for some time permanent, but a somewhat similar appearance results, in the first instance, from the presence of an alkaline phosphate; here, however, the yellow presently changes into a dirty green and black.

the second by Mr. Hume; and, with the corroboration afforded by the third method, they are effectual and satisfactory.

In examining the contents of the stomach of persons who have taken arsenic, we should always look for the poison in substance; but unless this be done immediately, it will very rarely be found: and the whole of the arsenic may be vomited or purged off, in the first instance, and the symptoms continue violent, though nothing can be detected in the stomach and bowels. It is in these cases that we must be on our guard against the effect of bile or other colouring substances, as affecting the copper test, and against that of muriatic and phosphoric salts upon solution of silver; and in all such cases we must not be satisfied of the presence of arsenic, till it has been unequivocally ascertained by the third test, namely, that of the *alliaceous sublimate:* this renders all other precautions unnecessary.

The symptoms by which arsenic manifests itself upon the living system, are numerous, complicated, and often not very determinate. Spasmodic pains in the stomach and bowels, attended by a sense of heat in the mouth and of constriction in the œsophagus, by an increased flow of saliva, a sense of tightness about the integuments of the head and of the eyelids, are among the earliest of the commonly occurring symptoms, and, together with inflamed tunica conjunctiva, and itching of the face and neck, and nausea, are not unfrequently witnessed where arsenic is incautiously exhibiting as a medicine. To these there succeed incessant vomiting and purging, attended by excruciating pain of almost every part of the body; but of the stomach, bowels, and head, especially: the pulse, at first full, hard, and frequent, sinks, and becomes irregularly feeble; and clamminess of the skin, cold sweats, purple spots, and convulsions, precede death; or, if the patient escape this catastrophe, hectic fever, paralysis and mental and bodily debility, attend him for the remainder of his days. It is commonly said that in these cases there is a remarkable proneness to putrefaction in the dead body, but this is no constant phenomenon.

The examination of the body after death does not throw much light upon the mode in which arsenic destroys; but this has

been to a certain extent determined by physiological experiments. The stomach and bowels exhibit more or less inflammatory appearances, but the inflammation is often so slight, as to shew that death cannot have arisen from that cause: and as the pharynx and œsophagus are free from it, and, moreover, as it has also been remarked in animals killed by applying arsenic to a wound, it is probable that such visceral inflammation is not the direct consequence of the actual contact of the poison. Indeed, upon this subject Mr. Brodie observes*, that the inflammation of the stomach was commonly more violent and more immediate than when the poison was administered internally; and that it preceded any appearance of inflammation of the wound. Hence the inflammatory appearances are to be considered as symptoms of the action of the poison upon the system; perhaps of its presence in the blood. From Mr. Brodie's experiments we may conclude, that the symptoms produced by arsenic, so far from being referrible to its effects upon the coats of the stomach and intestines, are to be ascribed to some peculiar and immediate influence of the poison upon the nervous system and heart, by which death is produced. Sometimes morbid affections of the heart predominate; at others those of the brain; and the symptoms vary accordingly: yet, if we except the occasional fluidity of the blood in the heart and vessels, the morbid appearances after death are confined to the stomach and bowels. The principal vessels leading to the stomach and intestines are turgid with blood, but the inflammation is usually confined to the mucous membrane of these viscera, which becomes fluid and pulpy, and easily separates from the cellular coat, which retains its natural aspect. But, although the affection of the stomach and intestines from arsenic is not ordinarily the cause of death, it may become so, provided the animal survive those effects which the poison produced upon the organs more essential to life.

Lastly, it may be asked how far there are any of the appearances after death, in cases of poison by arsenic, sufficiently unequivocal to enable us to decide upon the cause of death, independently of all more direct evidence. To this we

* Phil. Trans. 1812, p. 210.

must reply in the negative; for although the inflammation of the stomach and intestines, in such cases, is peculiarly extensive, and does not affect the pharynx and œsophagus, yet such appearances alone cannot be considered as exclusively belonging to the effects of arsenic. Moreover, it has been justly observed by Mr. Brodie*, that although, when arsenic has been taken in substance, small particles of it are frequently found in the mucus or extravasated blood, yet, where this is not the case, "I have never known in an animal that was capable of vomiting, that arsenic could be detected in the contents of the stomach after death, though examined by the most accurate chemical tests." In such cases arsenic has also been sought for in the blood and in the urine, but has never been detected.

The medical treatment which should be adopted for the relief or cure of persons poisoned by arsenic, may be summed up in a few words. The vomiting excited by the poison should be encouraged by a dose or two of a solution of sulphate of zinc, in preference to ipecacuanha, and copious draughts of mucilaginous liquors, such as barley-water and gruel. The bowels should be emptied by the least irritating means, as by castor oil, or a mixture of castor and olive oil. Opium, camphor, and ether, may be resorted to, to quiet the nervous irritability; and ammonia, in large doses, has proved of service in stimulating the heart, where its action has been irregular and feeble. But we must recollect the inflammatory action of the stomach and bowels with which we still have to contend, and consequently the stimulating system must give way as soon as may be to a cooling regimen, mild aperients, bleeding, and the usual remedies and treatment. The debility, paralytic affections, and generally broken-down health, are afterwards to be encountered by tonics, sea-bathing warm and cold, nervous stimulants, and a strict attention to diet, which commonly should be nutritive, but light: milk and farinaceous food, in preference to animal diet. That persons may recover, after having swallowed a very large quantity of arsenic, has been shown by Dr. Roget†, to whose treatment and remarks I refer the reader.

* Phil. Trans. 1812, p. 217. † Med. Chir. Trans. ii. 136.

ASARI FOLIA—*Asarabacca Leaves—the Leaves of the Asarum Europæum.*—These, when dried with little heat, and not kept too long, retain much of their acrimony; they enter into the composition of the *pulvis asari compositus*, which, applied to the nostrils after the manner of snuff, considerably augments the nasal discharge, and has been recommended in ophthalmia and headach, under the name of *herb snuff*. Emetic and cathartic effects follow the internal use of asarabacca leaves, but they are limited in medicine to the former application.

ASSAFŒTIDÆ GUMMI RESINA—*Assafœtida.*—This gum resin is obtained from the root of the *Ferula assafœtida*, which, when fully grown, is of a large size, and abounds in milky juice: another species, the *Ferula Persica*, is also sometimes resorted to. It is a native of the south of Persia, and is said to afford the best juice when about four years old. When the leaves and stem decay, they are cut off at the root, and the exudation that takes place at the section being scraped away, a fresh section is made, and so on, till the root has yielded its entire produce. In its recent state it is white and semi-fluid, but by exposure to the sun it gradually hardens, and assumes a reddish colour.

The best assafœtida is imported in boxes or casks; and we find it in trade in large lumps, made up of irregular agglutinated masses, of a tough consistence, and motley appearance, from the mixture of white drops or tears with others of a violet, red, and brown tint. An inferior kind is full of sand, very fetid, and said to be a compound of garlic, sagapenum, turpentine, and a little real assafœtida.

Assafœtida is stated by pharmaceutical chemists to contain more gum than resin, and to afford about 10 *per cent.* of highly odorous volatile oil, on distillation with water; so that it deteriorates considerably when kept for a long time. Its taste is acrid, and strongly that of garlic. Digested in proof-spirit, it furnishes the *tinctura assafœtidæ*; and triturated with water, in the proportion of 2 drachms to 8 ounces, the *mistura assafœtidæ* of the Pharmacopœia: to this a little mucilage of gum arabic should be added, to prolong the suspension of the resin.

The principal medical uses of assafœtida are, as a stimulant and antispasmodic in hysterical and nervous diseases and spasmodic cough; as an expectorant in asthma; and as a carminative in flatulent cholic. It has also, in common with garlic, been much extolled as an anthelmintic. It may be considered as standing foremost, in point of efficacy, among the fetid gum resins; but its strong smell is much against its general use. The largest dose is about 20 grains; it is most conveniently administered in pills, and commonly in 5 grain doses, combined, if necessary, with expectorants, in cough; and with chalybeates and aloetics in hysteria and chlorosis. The following formula will sometimes allay obstinate attacks of *spasmodic* cough, and has been found useful in hooping cough:—

℞ Assafœtidæ ʒss.
Liquoris Ammon. Acet.
Aquæ Pulegii āā f℥ij.
M. cap. cochleare unum vel duo pro dosi.

The following is a good fetid anti-hysteric, or nervous mixture; and it is curious that these remedies are not unfrequently effectual in direct proportion to their bad odour.

℞ Misturæ Camphoræ f℥iij.
——— Assafœtidæ f℥ij.
Tinct. Valerianæ,
Spiritûs Ammoniæ Compos.
——— Etheris Compos. āā f℥ij.
M. fiat mistura, cujus sumantur cochlear. duo ampla subinde.

For the relief of cholic of the lower bowels, the following glyster may be administered:—

℞ Assafœtidæ ʒij.
Decocti Avenæ f℥x. Misce.

AVENÆ SEMINA—*The decorticated Seeds of the Avena Sativa, or common Oat, generally called Grits.*

The value and uses of gruel, as an article in the diet of invalids, are too well known to require panegyric. Oats con-

tain about 74 *per cent.* of nutritive matter, 64 of which may be called starch, and the remainder gluten, with a small proportion of sugar. For children brought up, as it is called, by hand, equal parts of gruel and cow's milk form the best substitute for the food which nature intended for them; but the greatest attention should be paid to the freshness both of the milk and gruel: in warm weather, or in a warm room, the latter becomes acescent in 12 hours, and will then invariably be mischievous, if not dangerous: the cleanliness of the vessels in which the food is kept and prepared must also be most strictly looked after; for it often happens that the bowel complaints, and other disorders to which children under such circumstances are liable, arise from inattention to these apparent trifles.

AURANTII BACCÆ AND AURANTII CORTEX—*The Fruit and the external Rind of the Fruit of the Citrus Aurantium, or Seville Orange.*—As far as the fruit is concerned, the China or sweet Orange is to be preferred, but the rind of the Seville orange is most bitter and aromatic. It is a very useful stomachic, and as such is added to a variety of bitter and aromatic infusions. It should be thin, bright-coloured, free from the white part, and from mouldiness. The unripe fruit, or berries of the orange tree, commonly called *Curaçoa oranges*, are bitter and aromatic; infused in brandy, they impart flavour to the celebrated Dutch liqueur called Curaçoa. Water distilled off orange flowers is a very agreeable perfume: the essential oil is less pleasant.

BALSAMUM PERUVIANUM—*The Balsam of the Myroxylon Peruiferum—Peruvian Balsam.*—The tree which affords this balsam grows in the warmest parts of South America; it is obtained by boiling the twigs in water: it has a deep brown colour, considerable consistency, a fragrant aromatic smell, and a pungent bitterish flavour. When distilled it affords a volatile oil and benzoic acid, and a resinous matter remains in the retort. Balsam of Peru has been recommended in doses of ʒss. to ʒj. as a stimulant in chronic rheumatism, and it appears to have been effectual in some obstinate cases.

In chronic asthma and old dry coughs it is said to have proved a serviceable expectorant. The best form for its administration is the following :—

℞ Balsami Peruviani ℥ss.
Mucilaginis Acaciæ ℥ij. tere simul et adde
Aquæ Cinnamomi f℥ss.
——— Distillatæ āā f℥ss.
M. fiat haustus ter die sumendus.

Mixed with twice its weight of spermaceti ointment, and applied to indolent ulcers, it will sometimes improve and cleanse them. ℥j. of *unguentum cetacei*, made with almond instead of olive oil, and 15 drops of Peruvian balsam, well mixed by trituration, form an elegant lip-salve. Mr. Thomson observes that a mixture composed of ℥j. of the balsam and ℥iij. of ox-gall, is useful when dropped into the ear every day, after syringing with solution of soap, in fetid discharges from that organ.

BALSAMUM TOLUTANUM—*Tolu Balsam.*—This has generally been considered as the produce of a South American tree (the *Toluifera balsamum*), but from a recent inquiry into the subject it appears that it is obtained by exudation from the *Myroxylon Peruiferum*—that it flows freely from incisions in its bark, and is collected in mats and calabashes, where it hardens, and is thus brought to this country.

In very cold weather Tolu balsam is brittle, but when kneaded a little in the warm hand, it becomes soft and tenacious. It has an agreeable balsamic smell and taste; when heated, it fuses, inflames, and disperses a very pleasant benzoic odour. Distilled with water, it yields a little volatile oil and benzoic acid.

Tolu balsam is placed by systematic writers on the Materia Medica among the stimulating expectorants, and as such has sometimes been employed in dry chronic coughs, unattended by inflammatory action, in doses of from 5 to 20 grains. The only use now made of Tolu balsam is to impart a pleasant flavour to syrup and lozenges. It forms an ingredient in the *tinctura benzoini compositi* of the Pharmacopœia,

which is merely a slight modification of the once celebrated *Friar's balsam.*

BELLADONNÆ FOLIA—*The Leaves of the Atropa Belladonna, or Deadly Nightshade.*—The leaves of this plant have a nauseous bitterish taste, and are intensely poisonous. In an overdose they produce delirious wandering of the mind and stupor, dilatation of the pupil, convulsions, and death; and, when even very carefully administered in the form of powder or of extract, in doses commencing with one grain, alarming symptoms not unfrequently succeed, such as headach, vertigo, imperfect vision, and dilated pupil: these consequences oblige us immediately to desist from its use. Upon the whole, there appears to be so much doubt of any decided benefit having been been obtained by the internal use of belladonna, whilst its occasional mischievous influence is so sudden and unmanageable, that there must be much difference of opinion as to the propriety of its administration. As an external application, belladonna may be more safely employed, but even then it requires attention and management. A plaister composed of equal parts of extract of belladonna and common plaister; or an ointment, consisting of equal weights of lard, and of the powder of the recently dried leaves, are often of effectual service in the relief of local pains arising from chronic disease or rheumatism. The ointment, rubbed upon the perinæum, alleviates chordee; and the powdered leaves sprinkled upon the part, or an infusion of them employed as fomentation, have proved effective in allaying the pain of unhealthy sores. Half a drachm of the dried leaves to half a pint of water, furnish an infusion which, when dropped into the eye, causes a dilatation of the pupil that endures for many hours,—a circumstance of which oculists sometimes avail themselves, as facilitating the operation for the depression of cataract; and which, by admitting the rays of light more extensively upon the retina, enables persons suffering from incipient cataract, to enjoy a considerable temporary improvement of vision.

It sometimes happens that ignorant persons and children are poisoned, by inadvertently eating the berries of nightshade; and where this is the case, it is generally fatal, for the effect

upon the stomach is such as often to render it insensible to emetics. Sulphate of zinc or of copper should, however, be tried; brisk purges should be administered; and it is said that vinegar, and vegetable acids generally, are useful auxiliaries in promoting the cure.

The virulent activity of belladonna appears to depend upon the presence of a salifiable principle, to which its discoverer, M. Brandes, has given the name of *atropia*, and which forms distinct salts with the acids. It may be obtained by boiling the leaves in a very dilute sulphuric acid, filtering the decoction, and supersaturating it with potassa, which occasions a crystalline precipitate of impure atropia. It may be rendered pure and white by repeatedly dissolving it in dilute sulphuric acid, and precipitating by potassa. "I once," says M. Brandes, "tasted a small quantity of sulphate of atropia; the taste was not bitter, but merely saline; but there soon followed violent headach, shaking of the limbs, alternate sensations of heat and cold, oppression of the chest, difficulty of breathing, and diminished force of circulation. The violence of these symptoms ceased in half an hour."

BENZOINUM—*Benzoin*—A substance obtained by incisions of the bark of the *Styrax benzoe*, a tall tree, native in Sumatra. It is brought to Europe in large masses of an amygdaloidal appearance; its colour is pale brown, with white spots. It is brittle, of a resinous aspect and fracture, very fragrant when warmed, and affording, upon the further application of heat, about 10 *per cent.* of benzoic acid. A very inferior article is also found in the market, indistinctly mottled, of a darker colour, and abounding in various impurities: it is good for nothing. The uses of benzoin are now chiefly limited to the production of benzoic acid; it forms an ingredient in some articles of perfumery, and in fumigating powders and pastiles.

BISMUTHUM—*Bismuth.*—This is a brittle metal, of a foliated texture, and having a reddish yellow tint. It fuses at about 460°: its specific gravity is 9.5. It frequently contains a portion of arsenic, but in the preparation of the subnitrate of bismuth, the only compound used in pharmacy, that pernicious

metal is separated. Old pharmaceutical writers describe bismuth under the names of *tin-glass* and *marcasite*. The metal itself is not used medicinally.

BISTORTA—*The root of the Polygonum Bistorta, or greater Bistort*—A powerful astringent, sometimes used in combination with aromatics in the cure of intermittent fevers. It is now very rarely employed.

CAJUPUTI OLEUM—*Cajuput Oil*, obtained by distillation from the leaves of the *Melaleuca Cajuputi*, a shrub abundant in Amboyna and part of Borneo, whence the essential oil is imported. It generally has a greenish colour, arising, as it is said, from the copper flasks in which it is brought to Europe; but none of the samples which I have examined contain copper. When recent it is nearly colourless. It is highly pungent and aromatic, its odour resembling that of camphor and cardamom seeds. It is extremely volatile, lighter than water, and readily and entirely soluble in alcohol, which is not the case if it be adulterated with oil of turpentine. It is powerfully stimulant and diaphoretic in doses of from 5 to 10 drops, and in the East has gained much celebrity in chronic rheumatism, spasmodic cholic, and certain paralytic and nervous affections calling for rapidly acting and diffusible stimuli. In these cases it is also applied externally as a liniment, either pure or diluted with olive oil. Put into an aching tooth, upon a piece of cotton, it quiets the pain as effectually as any other essential oil.

CALAMINA—*Calamine—Impure Carbonate of Zinc.*—Several chemical varieties of ores of zinc are known under the name of Calamine, or *lapis calaminaris;* they consist chiefly of carbonate of zinc, but are generally intimately mixed with variable portions of other ores and stony matter; so that, on account of this uncertainty, it seems doubtful whether calamine should be retained in the Pharmacopœia. That which we find in commerce is usually in buff-coloured or reddish grey fragments, of an earthy aspect, and is directed in the Pharmacopœia to be prepared by calcination, and to be reduced to a very impalpable powder by the usual processes.

Water and more or less carbonic acid are thus expelled by heat, the degree of which should have been more explicitly directed than we find it under the head "*Calamina praeparata*" in the Pharmacopœia.

Calamine is only used externally, either as a digestive, in the form of *Ceratum calaminæ*, or *Turner's cerate*,—or in powder, to sprinkle upon ulcerating surfaces: it keeps the sore clean by abstracting the secretion, very rarely irritates, and does not otherwise interfere with the healing process: hence it is often a useful application to venereal sores, keeping them cleanly, and not interfering with the influence of mercury upon their healing process.

CALAMI RADIX—*The Root of the Acorus Calamus, or Sweet-flag*—A plant which thrives abundantly in moist situations over great part of Europe and Asia. The odour of the dried root is agreeably aromatic, and its flavour pungent and warm. Its fracture is short and rough, and internally it is of pale buff colour. When too old it loses its virtue, and is apt to get worm-eaten. Most writers on the Materia Medica say that this root is less prescribed than it should be; but there are so many more agreeable and equally effectual aromatic tonics, that it is nevertheless rarely employed. The infusion, in the proportion of ℥j. of the bruised root to 1 pint of water, is the best form of administering it. By distilling the root with water, it affords about 1 *per cent.* of essential oil, not very agreeable in its odour, but used in some articles of perfumery.

CALUMBÆ RADIX—*Calumba, or Columba Root.*—This is the root of an undescribed plant, imported into Europe from Mozambique in bags and cases. It is usually dried in slices, having a thick yellow bark, covered with an olive-coloured cuticle, and surrounding a browner and spongy central portion. It is almost always worm-eaten, but it should be selected as little so as possible, and of a bright colour. It has a strong, bitter, and slightly pungent taste; and its aqueous infusion, which is the usual and best form of administering it, holds a considerable portion of mucilage, and

is very prone to decomposition in a warm atmosphere; so that it should always be freshly prepared. It is said sometimes to be mixed with slices of briony root, which have been infused in quassia water and tinged with saffron.

Calumba is a very good simple bitter, and perhaps more agreeable to delicate stomachs than most other medicines of this class; especially in the form of weak infusion, conjoined, if necessary, with aromatics, in dyspepsia, in diarrhœa, and in the after-treatment of cholera morbus. Alkalies, acids, and saline aperients may also be administered with it, and it is not blackened by solutions of iron. The following is a good formula where flatulency and heartburn are attending on a slightly gouty habit, with a red deposit in the urine:—

℞ Infus. Calumbæ f℥v.
Tincturæ Calumbæ f℥j.
Ammoniæ Subcarbon. ℥ss.
M. fiat mistura; sumantur cochl. iij. ampla mane et meridie.

Of the powdered root, from 5 to 20 grains may be taken three times a day, and it may be conveniently formed into pills with a few drops of water only.

℞ Seminum Carui contus.
Calumbæ Rad. contus.
Rhæi Rad. contus. āā ℈j.
Aquæ ferventis f℥viij. Macera per horas duas et cola.

℞ Liquoris Colati f℥iijss.
Tinctur. Rhæi f℥j.
Syrup. Cort. Aurant. f℥ij. M.

From a tea-spoonful to a table-spoonful of the above may be given, according to their age, to children who are troubled with diarrhœa occasioning debility during dentition; but care should be taken not to check such laxity of the bowels suddenly or unnecessarily, as it is often the comparatively harmless substitute of the more formidable evils that attend teething.

CAMBOGIA—*The Gum Resin of the Stalagmitis Cam-*

bogiodes; Gamboge.—This substance is chiefly imported from Ceylon, in cakes rolled up in flag-leaves, and is much used as a yellow water-colour. In medical effect it ranks with the most drastic purges; but as it is apt to excite nausea and vomiting, and to gripe excessively, it is rarely used, except in very small doses along with other cathartics. According to Dr. Paris, it enters as an ingredient into many of the empirical compositions which are sold for the cure of tape-worms, in which indeed, combined with calomel, it is very effectual, but less certain and more drastic than a large dose of oil of turpentine.

From 4 to 6 grains of gamboge is usually a very operative dose, but the addition of a grain to other purgatives is often useful in sharpening their activity. A solution of gamboge in carbonate of potassa is said to be purgative and diuretic, and as such has been recommended in dropsical affections.

CAMPHORA—*Camphor*—A substance obtained by distillation from the *Laurus Camphora*, having the leading characters of a concrete volatile oil. It is also found in several other plants. When purified by sublimation, we find it in commerce in cakes weighing about 8lb each, sonorous when struck, white, translucent, and somewhat tough in consistency, but admitting of reduction to powder by the aid of a few drops of spirit of wine. Its odour is strong and agreeable to most persons, its taste cooling, and at the same time aromatic and pungent.

It is very sparingly soluble in water, but copiously in alcohol, which takes up about its own weight. The aqueous solution has long been known in pharmacy under the name *camphor julep*, of which a wine-glassful taken occasionally is useful in nervous irritability, and it forms a good vehicle for other anodynes and sedatives. Camphor may also be administered in the form of pill, or suspended in liquids by the aid of mucilage.

Much difference of sentiment exists as to the virtues of camphor, and by some it is undeservedly condemned as inefficacious. In small doses it acts as a sedative and diaphoretic, these effects being preceded by slight exhilaration; in doses, for instance, of from 1 to 3 grains. Persons who

cannot procure rest except from large doses of opium will sometimes succeed by combining smaller doses with camphor.

Camphor produces little effect upon the pulse, except in large doses, when it softens it and renders it fuller. It is a useful adjunct to bark in typhoid diseases; to valerian, the fetid gums, volatile alkali, and ethereals, in hysteric and nervous complaints; and to antimonials, and other diaphoretics, in rheumatism and certain inflammatory disorders. The following formula may be used for the independent exhibition of camphor:—

℞ Camphoræ gr. iij. (ope alcoholis, in pulverem tritæ.)
Mucilaginis Arabici f℥j.
Misturæ Amygdalæ f℥iss.
M. fiat haustus.

The following are Dr. Hooper's prescriptions for "Mistura Camphoræ fortior." They are excellent forms for its exhibition.

℞ Camphoræ gr. xxv.
Amygdalas dulces decorticatas vj.
Sacchari purificati ℥iij.
Optime contere, dein adde gradatim
Aquæ Menthæ viridis f℥vijss. ut fiat mistura: sit dosis cochlearia tria magna.

℞ Camphoræ gr. xxv.
Spiritûs rectificati ♏v.
Fiat terendo pulvis; dein adde
Pulveris Acaciæ ℥iv.
Syrupi Limonum f℥ss.
Aquæ Menthæ viridis f℥vij. ut fiat emulsio: sit dosis cochlearia tria magna.

In cases of febrile action, where the object is to allay irritation, promote perspiration, and induce sleep, either of these mixtures may be resorted to.

I should consider 5 grains of camphor every four hours as a full dose; that is, as likely to produce all the advantages to be derived from the remedy: it has been given in doses of from 20 to 30 grains, and is then apt to produce vomiting, giddiness, and other deleterious effects.

As an external application, camphor is often employed in rheumatic and other painful affections of the muscles, joints, &c. Its solutions in oil and in spirit, and the *linimentum camphoræ compositum* of the Pharmacopœia, are good formulæ for these purposes. Twenty or thirty grains of powdered camphor added to a common poultice will sometimes relieve obstinate rheumatic affections of tendinous parts; and applied to the perinæum, it is very effectual in diminishing irritation in gonorrhœa and allaying chordee.

CANELLÆ CORTEX—*The Bark of the Canella alba.*—This bark is imported from the West Indies, generally in long quilled pieces of a pale buff colour, an agreeable aromatic odour, and a warm pungent and somewhat bitter taste. The Materia Medica is already thronged with aromatics, and canella bark has nothing to recommend its preference.

CANTHARIDES—*Cantharis Vesicatoria; Spanish Flies.*—When taken internally, in doses not exceeding a grain, cantharides prove violently stimulant to the urinary and generative organs; their effects are usually sudden, and often differently counteracted, and the diseases in which they have been administered always admit of a less objectionable system of treatment.

Applied externally, in the form of the "Emplastrum Cantharidis," they stimulate and redden the skin, and afterwards excite a serous discharge from the exhalant vessels which raises the cuticle in a blister; and this they do more certainly, rapidly, and effectually than any other known substance. The application of blisters is generally thought little of, but much discernment is often necessary in their use, and the remedy is of a nature that should not be tampered with. Sometimes they excite irritation, restlessness, and fever, and so prove more prejudicial than useful; sometimes they heal with difficulty, and have even produced troublesome and dangerous sores; sometimes the urinary organs are violently affected by absorption; and sometimes erysipelas is brought on to an alarming extent.

The cases demanding the application of blisters are principally the following:—To the head and neck in nervous

fever attended by delirious anxiety, dimness of sight, deafness, and general debility; also in paralytic affections, either to the head, or to the part, or neighbourhood of the part affected. In all cases of internal inflammatory action, blisters applied near the affected part often transfer the increased action from it to the skin.

In spasmodic affections, cramp, and intermitting rheumatism and sciatica, blisters as often do harm as good. In peritoneal inflammation and inflammation of the bowels, blisters should not be applied till the violence of the symptoms has been removed by bleeding and purgatives: for, by the general soreness of the abdomen which they produce, they prevent recourse to a most important criterion of the state of the disorder, namely, the degree of pain produced on pressure. Where, however, after the active symptoms have been subdued, a chronic form of disease is apprehended, blisters are of much service, and should generally be applied successively, at intervals not too long. In dropsical habits, in very irritable temperaments, in persons suffering from gravel, stone, stricture, or any kind of urinary irritation, blisters are, with few exceptions, contra-indicated.

In applying blisters, care should be taken to attach them to the part by a proper rim of adhesive plaister, for awkward accidents have sometimes happened from their changing their place; they should not, however, be bandaged down. A blister plaister should be removed as soon as the vesication is perfect, which usually requires from 8 to 12 hours; and if urinary irritation is complained of, diluent and mucilaginous drinks of any kind should be freely administered.

It is not exactly known upon what the activity of the Spanish fly depends: its active constituents are dissolved both by alcohol and by water; hence the tincture of cantharides is often added to increase the energy of stimulating liniments.

We are chiefly supplied with cantharides from Astracan and Sicily, whence they are imported in casks and chests. They should be dry, and free from mould and dust, of a strong nauseous odour, brilliant colour, and not mixed with other beetles, which is frequently the case to a great extent. They may be kept for any length of time in a dry place, and secured from air; but they are very liable, notwithstanding

their acrimony, to the attacks of small insects, which gradually reduce them to dust, without, however, materially affecting their activity.

CAPSICI BACCÆ—*The Berries of the Capsicum annuum, or Cayenne Pepper.*—This agreeable and well-known condiment has been introduced into the Materia Medica on account of its powerfully stimulating qualities. Many varieties of capsicum probably enter into the composition of Cayenne pepper, which consists of their powder, mixed with a very variable proportion, but generally about half its weight, of common salt. Other adulterations are practised upon it, such as the addition of coloured sawdust, and, according to some, of red lead: the latter fraud is very easily detected, by the rapidity with which it sinks in water through which the pepper is diffused; or by digesting it in dilute nitric or in acetic acid, and then applying to the filtered solution the usual tests for the detection of lead, such as sulphuretted hydrogen, and sulphate of soda—the former giving a black, and the latter a white precipitate.

The best form for exhibiting capsicum is in pills, mixed with bread crumb; and, of the genuine pepper, from five to ten grains may be called a dose. The complaint in which it is most useful is flatulent dyspepsia. In the form of gargle it furnishes a truly valuable remedy in some kinds of sore throat, more especially in the milder forms of ulcerated sore throat. The tincture of capsicum is a convenient form in such cases. From half a drachm to two drachms may be added to six ounces of infusion of roses, or any other convenient diluent; but as the acrimony of the tincture is variable, and as different throats bear it very differently, it is difficult precisely to lay down the dose. The infusion of the berries may be used as follows:—

℞ Capsici Baccarum contus. gr. x.
Aquæ ferventis f℥viij. Infunde per horas duas etcola.

℞ Colati Liquoris f℥vij.
Mellis Rosæ,
Tinctur. Myrrhæ, āā f℥ss.
M. fiat. gargarisma frequenter utendum.

CARBO LIGNI—*Charcoal.*—Well-burnt and newly prepared charcoal has the property of destroying the odour of many substances, and of arresting the progress of putrefaction: upon this principle it has been ridiculously administered in those cases of dyspepsia which are attended by fetid eructations. Such cases, it is true, are often troublesome and disagreeable enough, but they are only to be remedied by correcting the state of the digestive organs.

Finely powdered charcoal forms an excellent tooth-powder; it cleanses the mouth mechanically and chemically; but as, alone, it is dusty, and not easily miscible with water, it may for this purpose be mixed with an equal weight of prepared chalk, and, if requisite, scented with a drop or two of oil of cloves.

CARDAMINES FLORES—*The Flowers of the Cardamine pratensis—Cuckoo Flower.*—These flowers, dried, have been given, in doses of from one to three drachms, in several spasmodic and convulsive diseases; but they are of too doubtful efficacy to require any further notice.

CARDAMOMI SEMINA—*Cardamon Seeds—the Seeds of the Matonia cardamomum.*—These seeds, contained in their capsules or pods, are imported from Bengal in cases of about 1 cwt. each; those which are small, broad, and heavy, are preferable to the longer kinds, which contain fewer seeds, and less closely packed. The capsules are insipid, but the seeds (which are sometimes found in trade out of the capsules) are highly pungent and aromatic, and abound in essential oil. Their chief use is in combination with other remedies, especially cathartics and bitter tonics; thus we find them in the *extractum colocynthidis compositum*, and in the *tinctura rhei*, and *tinctura sennæ*, of the Pharmacopœia.

CARICÆ FRUCTUS—*The Fruit of the Ficus carica, or Fig-tree.*—Figs are gently aperient; and, when boiled or roasted, and split, they form a useful substitute for a poultice, applied hot to suppurating tumours. This is, indeed, the most ancient form of poultice on record; for we read in 2 Kings,

xx. 7—"And Isaiah said, take a lump of figs; and they took and laid it on the boil, and he recovered."

CARUI SEMINA—*The Seeds of the Carum carui—Caraway Seeds.*—This plant is cultivated for the sake of its seeds, which are found in the market both of English growth and of foreign importation. The former are generally preferred, as being more plump, fresh, and aromatic. The Dutch seeds are apt to be musty and insipid. Their well-known flavour is derived from the presence of essential oil, which they yield, on distillation, in the proportion of about 3 *per cent.* They are usefully added to purgative remedies to prevent griping; and are sometimes administered in cholic and flatulency, in the form of powder, the dose of which is from twenty to sixty grains. The distilled oil, spirit, or water, are however, generally substituted for the seed in substance.

CARYOPHILLI—*The unopened Flower-buds of the Eugenia caryophillata—Cloves.*—CARYOPHILLORUM OLEUM—*Essential Oil of Cloves.*—Cloves are imported from the Dutch settlements in India. They are of a rich brown colour, a very fragrant aromatic odour, and hot and acrid upon the tongue. A portion of oil exudes from their broken surface, when gently pressed by the nail. Good cloves yield, on distillation, about one-sixth their weight of essential oil; but the proportion and quality of the oil varies with the quality of the spice.

Cloves are one of the best pharmaceutical aromatics; and added to bitter and other infusions, they render them more agreeable both to the palate and stomach. A drop or two of the oil corrects the griping tendency of cathartic pills, and sometimes appears to augment their efficacy. A five-grain pill, composed of equal weights of powdered cloves and jalap, will generally evacuate the bowels.

CASCARILLÆ CORTEX.—*Cascarilla Bark—the Bark of the Croton cascarilla*—This valuable aromatic bitter is imported from the Bahama Islands in small quilled pieces,

breaking short and resinous, and of a deep-brown colour in their interior. Its smell is aromatic, and when burnt it exhales a strong musky odour, which is very peculiar. Its taste presents a combination of aromatic warmth and bitterness.

The infusion is the best form in which cascarilla can be administered; for although the decoction retains the bitterness, it has lost the aroma: this may be made in the proportion of from one to two ounces of the bruised bark to a pint of boiling water; a quantity which should infuse four hours in a close vessel. When strained it is of a clear brown colour.

℞ Infusi Cascarillæ f℥v.
Tinctur. Cascarillæ f℥ss.
M. sumat quartam partem ter vel quater die.

Two drachms of *spiritus ammoniæ compos.* may be added to the above, and it forms an excellent tonic. It is also a very good vehicle for powdered Peruvian bark, in the cure of fevers; for astringents, in bowel complaints; and for small doses of sulphate of magnesia and sulphuric acid, in dyspepsia attended by constipation. The powder of the bark is a bad form, in consequence of the large proportion of inert woody fibre which it includes.

CASSIÆ PULPA—*The Pulp contained in the pods of the Cassia fistula.*—This pulp is a brisk aperient, and forms an ingredient in two confections of the Pharmacopœia—the *confectio cassiæ* and the *confectio sennæ.* It has a sweet, mucilaginous taste; and, if given alone, is very apt to gripe. The pods are brought from the East and West Indies; they are about half or three-fourths of an inch thick, one to two feet long, black, and furrowed upon one side. Internally they exhibit numerous transverse cells, each of which contains a seed embedded in pulp. The East Indian pods are generally preferable to the others; but they have of late become very scarce in the British market, in consequence of want of demand.—(See *Confectio Sennæ.*)

CASTOREUM—*A peculiar concrete substance, contained in oval pouches situated near the anus of the Castor fiber, or*

beaver.—These pouches, or follicles, are four in number; the two smaller contain a fatty matter, while the larger include, in their membranous cells, a viscid fetid substance, which is the *castor* of the Materia Medica.

Two kinds of castor are met with in trade; the best is from Russia, Prussia, and Poland, and now scarcely to be obtained; the pods are large and firm, and their contents dry, of a red brown colour, pulverulent but somewhat tough, of a strong and peculiar odour, and a bitter, nauseous taste. The other kind of castor is imported from Canada, and is the only variety now to be procured in the drug market: the pods are usually flatter, smaller, and moister than the former; and their contents so miscellaneous as to baffle all attempts at description. The matter which they contain is commonly of a yellow or buff colour, of a resinous appearance, and a faint nauseous odour: sometimes it is soft, viscid, and fetid in the extreme; sometimes unctuous; and sometimes black and inodorous. The yellow resinous kind is usually preferred, but it is difficult to say on what grounds.

Castor has been extolled as a safe and effectual antispasmodic in typhus, hysteria, and epilepsy; but its uncertain composition and quality, and its extremely high price, are obvious bars to its use. Moreover, its virtues are of a very doubtful description; and it seems uncertain whether any real benefit has followed the use of the drug in its most genuine form. It has been administered in doses of from ten to twenty grains; and the tincture is frequently prescribed as an addition to antinervous mixtures. In his Pharmacologia, Dr. Paris says—"it is antispasmodic, and seems to act more particularly on the uterine system. It certainly proves beneficial as an adjunct to antihysteric combinations."

CATECHU EXTRACTUM—*The Extract of the Acacia catechu*.—This substance used formerly to be called *terra Japonica*, and was absurdly considered as of mineral origin. It is imported from Bengal and Bombay, and presents two varieties; one, of a pale reddish brown colour, pulverulent, and of an astringent taste, accompanied by a degree of sweetness; the other, of a resinous fracture, a brown colour, and a more astringent and bitter flavour. In composition these

varieties resemble each other; and they are both liable to be largely mixed with sand and other impurities.

Catechu consists chiefly of tan, gallic acid, and extractive matter; it is soluble, impurities excepted, in water, affording a highly astringent solution; hence the infusion and tincture are used in diarrhœa, and other cases where astringents are indicated. In relaxed uvula it is often effectual, either chewed, or used as a gargle in the form of infusion; and public speakers and singers often resort to lozenges containing it, as an effectual preventive of hoarseness. In diarrhœa, connected with relaxation and acidity, two or three table-spoonsful of the following mixture will usually prove effective:—

℞ Misturæ Cretæ f℥v.
Tinctur. Catechu,
Tinctur. Cinnamon. āā f℥ss. M.

Or the following powder, as directed by Dr. Paris:—

℞ Pulv. Cretæ Comp. cum Opio ℈j.
Pulv. Catechu gr. xv.
Sit pulvis post singulas sedes liquidas sumendus.

Where the gums are spongy, Dr. Paris recommends the following dentifrice:—

℞ Cinchonæ Lancifol. Pulv.
Catechu Extract. Pulv. āā ℥ss.
Pulv. Myrrhæ ʒij. M.

CENTAURII CACUMINA—*The Tops of the Chironia centaureum, or common Centaury.*—A simple bitter, and an unnecessary incumbrance to the list of Materia Medica.

CERA FLAVA—CERA ALBA—*Yellow or unbleached Wax—White or bleached Wax.*—From the experiments of Huber, it appears that wax is actually formed by the bee, though the frequency with which it is found as a vegetable proximate principle was generally considered as rendering it more probable that it was only collected by that insect. After the honey-comb has been completely drained of honey, it is washed, melted in boiling water, strained, and cast into round

cakes of different sizes, forming the yellow wax of commerce.

English and foreign wax are found in the market, the latter being chiefly imported from the Baltic, the Levant, and the coast of Barbary. Fresh wax has a bright and peculiar yellow colour, no taste, and an agreeable honey-like odour. Its specific gravity is .950. At low temperatures it is brittle, but acquires softness and tenacity when slightly warmed, and then admits of being kneaded without adhering to the fingers. It fuses at 140°, and at higher temperatures volatilises and burns with a bright white flame. "Wax, in this form, is often adulterated with earth, peasemeal, resin, and tallow. Earth or peasemeal may be suspected when the cake is very brittle, and the colour inclines more to grey than bright pale yellow: they may be separated by melting and straining the wax. The presence of resin may be suspected when the fracture appears smooth and shining, instead of being granulated; and it may be detected by putting small pieces of the wax into cold alcohol, which will readily dissolve the resinous part, without acting on the real wax. Tallow is discovered by the greater softness and unctuosity of the cake, and its disagreeable suffocating smell when melted *." Yellow wax is only used in the preparation of external applications.

Bleached or white wax is frequently adulterated with spermaceti, and is sold in the market at very different prices accordingly; in this case it is more opaque and softer than pure wax, and the surface of the cake has a peculiar mottled aspect; it is also more fusible than it should be, though when pure, white wax is less fusible than yellow; it should not liquefy below 155°.

White wax has occasionally been employed in diarrhœa and dysentery, but upon what principle is not very apparent. As an ingredient in cerates and ointments its use corresponds to that of yellow wax.

CEREVISIÆ FERMENTUM—*Yeast.*—A yeast poultice is sometimes successfully applied to ill-conditioned ulcerating sores. It has been recommended as a tonic and

* London Dispensatory, 1822, p. 226.

antiseptic in low fevers; but porter or ale, without the aid of yeast, would do as well.

CETACEUM—*Spermaceti.*—This well-known substance is found within the cranium of the *Physeter macrocephalus*, a large species of whale, chiefly found in the Southern Ocean. It occurs in the form of a spongy mass, from which the oil is allowed to run off, and the remaining portions separated by pressure. It is then purified by fusion in hot water, and afterwards by boiling in a weak potash lye: when sufficiently clean, it is cast into moulds, and allowed to concrete into those flaky, white, and translucent masses in which we see it in the shops. Its specific gravity is .940: its point of fusion about 110°. At about 500° it evaporates, and may be sublimed with little change, in close vessels.

As an internal remedy, spermaceti has no advantage over the fixed oils, yet it is sometimes administered in the dose of half a drachm, or two scruples, rubbed down with yolk of egg. It forms an ingredient in various ointments.

CINCHONÆ LANCIFOLIÆ CORTEX—*Pale Quilled Peruvian Bark.*
CINCHONÆ CORDIFOLIÆ CORTEX—*Yellow Bark.*
CINCHONÆ OBLONGIFOLIÆ CORTEX—*Red Bark.*

These have been selected from among the numerous species of the genus *Cinchona*, as the most essential distinct varieties for medical use. They are natives of South America.

The *Cinchona lancifolia* furnishes the pale or common Peruvian bark of the shops. It is imported in chests of about 200lb weight each, chiefly in rolled up pieces, or quills, of very various dimensions, mixed with larger and flatter pieces; these differences apparently depend upon the part of the tree from which it has been taken. In trade, we find these varieties in sorts: the small and fine quilled portions, being considered as most select, bear the highest price, and are called *crown bark.* The larger quills form a second commercial variety; and the flat, coarse, and broken pieces are the least esteemed. This bark is covered with a grey epidermis, having numerous transverse fissures, and more or less coarse according to the size of the quills. It is also generally abundant in lichens. Internally, it is of a deep cinnamon colour. Its smell, when

fresh, and in large parcels, is peculiar, and slightly aromatic; it should be free from all odour of other drugs, and from mustiness. Its fracture is short and dense;—its taste austere and bitter. The decoction of this kind of bark is reddish brown, and transparent while hot, but on cooling it acquires a much paler and yellow colour, becomes turbid, and deposits a brown sediment.

This is the species of cinchona which has always been most esteemed in the cure of intermittents, and in the treatment of diseases attended by general debility, in which it is certainly superior to all other tonics and bitters.

In ague it should be administered in sufficiently large doses in the intervals of the febrile fits; it has also been given during the paroxysm, but is then apt to nauseate. In nearly all diseases of an intermittent character, cinchona is equally effectual; in intermittent headach for instance, rheumatism, and other periodical and spasmodic affections. In some cases of *tic douleureux*, especially those attended by slight accessions of fever, and coming on at regular intervals, Peruvian bark has also proved of essential use. In these, and in almost all other cases where a course of bark is to be regularly pursued, the stomach and bowels should be cleared in the first instance by an emetic and purge—the bark may then be administered in gradually augmented doses, until it proves disagreeable to the stomach; the dose should then be lessened, or the remedy for a time desisted in, and resumed in the course of a few days.

In all fevers attended by great constitutional debility, and more especially where there are symptoms of putridity, bark must be regarded as the remedy from which most relief is to be hoped for; but in all cases, and here especially, care must be taken that it does not disagree with the stomach and bowels; and it must be given in conjunction with such other remedies as are likely to render it least offensive. The incautious exhibition of large doses of powdered bark in enfeebled constitutions, often proves infinitely mischievous. With the exception of some particular cases, bark ought not to be administered in febrile diseases of a typhoid character, and more especially not in pure typhus, until the skin becomes moist, and the excessive foulness of the tongue begins to diminish.

It is contra-indicated where the pulse is quick, hard, or full, where the tongue is parched, and where there is dyspnœa, or other inflammatory symptoms.

Bark has by some been indiscriminately recommended in acute rheumatism, but the more experienced practitioner will scarcely use it till the violence of the disease has been broken by other remedies, or till there are evident periodical exacerbations.

Bark often tends to the cure of ill-conditioned sores, and of eruptive disorders: where, however, gangrene is making any progress, it should not be too much depended on; at least, brandy, wine, and other alcoholic and ethereal stimulants, should be freely conjoined with it.

In phthisis pulmonalis, bark, if given in sufficient doses to produce any decided effect, should be very cautiously administered. Mr. A. T. Thomson's remark upon its use in this disease is correct and valuable:—"Bark is found beneficial," he says, "when the accompanying hectic puts on more of the intermittent form than usual, when the debility is considerable, and blood is mixed in the sputa: and in several cases of pneumonia, when, after repeated and large bleedings and evacuations, the pulse continued hard and thrilling, and the blood buffy, although the expectoration was free and the skin open, we have seen bark produce the happiest effects *."

In addition to the uses of bark which have been enumerated, it, as well as other tonics, is occasionally effectual in the removal of habitual costiveness arising from defective tone of the muscular power of the bowels †.

Were we, however, to enumerate all the diseases in which Peruvian bark at one period or other has been, and may probably be administered, we should go through nearly the whole catalogue of human maladies; so that, having pointed out the most prominent cases which call for its administration, I shall conclude by observing generally, that it is the most valuable tonic and strengthener that can be resorted to in all cases of general debility of constitution, from whatever cause they may proceed; and the greatest advantage is derived from it

* Lond. Disp. 1822, p. 246.

† Howship on Diseases of the Intestines, 3d Edit. p. 269.

by convalescents generally, even after inflammatory diseases, where copious bleeding has been necessarily resorted to.

The usual forms in which bark is administered are powder, decoction, and extract; to these the tincture is occasionally added.

The powder is very effectual where the stomach will bear it, but when persevered in, it seldom fails to create nausea and uneasiness, which, however, is often relieved by the addition of some aromatic, or by taking it, if the case admits, in Port wine. A very manifest objection to the powder is the quantity of inert ligneous matter which it includes, and which often loads the bowels to such an extent as to render the occasional administration of a purgative necessary, merely to get rid of the powder that clogs them. If bark purges, small doses of opium may be conjoined with it; if it constipates, a little sulphate of potassa, confection of senna, or any other analogous adjunct, may be used. The dose of the powder is of course very various. It has been given in the quantity of an ounce in twenty-four hours, but half a drachm three or four times a day will in common cases prove sufficient.

A strong decoction is a very good form for the exhibition of bark: the proportion should be two ounces of bruised bark to a pint of water. Two ounces of this decoction, with a drachm of the tincture four times a day, is a full dose; or the weaker decoction directed by the Pharmacopœia may be used as a vehicle for the extract.

The extract of bark *, if carefully prepared, and above all, dried in a very moderate heat, is an effectual preparation. It admits of being given in the form of pills; and dissolved in syrup, affords a good form for the administration of bark to children, when, as is often the case, they refuse other forms of this medicine.

℞ Extracti Cinchonæ ℥ij. Solve in
Syrupi Aurantii f℥ij. ut fiat Syrupus.

The dose of this syrup may be a teaspoonful every two or

* 50lb of cinchona yield upon an average about 20lb of aqueous extract; the same quantity of bark affords about 12lb of resinous extract when acted upon by alcohol.

three hours, or oftener if required; and where the bowels admit of it, it may be acidulated with diluted sulphuric acid.

Pharmaceutical chemists have long endeavoured to ascertain the nature of the active principle of bark; to determine whether any distinct substance exists in it to which its virtues are to be ascribed. Upon this subject, a variety of speculations have been from time to time published; but it is only very lately that the discovery has been made by Messrs. Pelletier and Caventou, who have detected in *cinchona lancifolia* a peculiar crystallisable and salifiable substance, which may be called *cinchonia*.

There are many processes by which cinchonia may be separated from Peruvian bark, but the following is perhaps the simplest.

A pound of bruised bark is boiled in about a gallon of water, to which three fluid drachms of sulphuric acid have been previously added. A similar decoction is repeated with about half the quantity of liquid, and so on, till all the soluble matter is extracted. The decoctions are then mixed together and strained, and powdered slaked lime is added in a proportion somewhat greater than necessary to saturate the acid; the precipitate that ensues (a mixture of cinchonia and sulphate of lime) is collected, dried, and boiled for some minutes in strong alcohol, which is then decanted off *while still hot*, and fresh portions successively added for the repetition of the same operation, until it ceases to act upon the residue, which is now merely sulphate of lime. The different alcoholic solutions are then put into a retort, or still, and considerably evaporated, during which, and especially on cooling, acicular crystals of cinchonia are deposited. When the whole is thus collected, the crystals, if yellow or discoloured, must be again dissolved in boiling alcohol, and thus, by recrystallisation, they will be obtained colourless.

Cinchonia thus procured is a white crystallised substance, of a slightly bitter taste, and very difficultly soluble in water. With most of the acids it forms intensely bitter and crystallisable compounds. The *sulphate of cinchonia* crystallises in prisms, and is soluble in about four parts of water at 60°. When cinchonia is heated in a glass tube it fuses, and at a high temperature is decomposed with the evolution of ammo-

nia, and a copious deposition of carbon. It appears to be a ternary compound of carbon, hydrogen, and nitrogen, and apparently contains no oxygen *.

In consequence of its difficult solubility in water, cinchonia in its pure state is not well calculated for use as a medicine, but the sulphate has been employed with great success in all those diseases in which bark is used. The dose is from one to three grains, two to four times a-day: it may be given in a pill, and accompanied with other bitters, tonics, or aromatics.

Neither pure cinchonia, however, nor its sulphate, have been much used, in consequence of the comparative cheapness of *quinia*, an analogous principle extracted from yellow bark, and supposed to be possessed of the same medical properties.

YELLOW BARK is the produce of the *Cinchona cordifolia*, or *heart-leaved Cinchona*. It is found in the shops chiefly in flat pieces, and in large rolls, or quills, eight or ten inches long. Its external epidermis is brown and thick; internally its colour is orange-brown. In smell it resembles the pale bark, but its taste is much more decidedly bitter, and scarcely at all astringent.

This species of cinchona has never been in the same estimation as the former; it has been deemed less febrifuge and tonic, and generally regarded more as a simple bitter than as possessing the decided peculiarities of the *cinchona lancifolia*. The experiments, however, of Pelletier and Caventou, have taught us that yellow bark includes a peculiar salifiable substance, separable from it by the method just described, and possessed of eminent febrifuge and tonic powers. To this substance, as has already been remarked, the term *quinina* or *quinia* has been applied. It is uncrystallisable, and separates from the alcoholic solution in the form of a viscid substance, somewhat like bird-lime. When dried in a gentle heat it becomes brown and brittle; but if very cautiously dried in an exhausted vessel, it is white and pulverulent; fusible; decomposed at a dull red heat; and in addition to the elements of cinchonia, affords unequivocal evidence of containing oxygen, inasmuch as water is produced during its destructive distillation.

* Quarterly Journal of Science, vol. xvi. p. 279.

Quinia combines with sulphuric acid, and forms a difficultly soluble salt, in small silky crystals, perfectly distinct from sulphate of cinchonia, but, like it, intensely bitter.

Sulphate of quinia has been exhibited in doses of from one to five grains, three or four times a day, though eight grains are by some regarded as equivalent to an ounce of bark. It appears to me most prudent to begin with small doses, and if they answer the intended purpose, not to increase them; if not, they may be augmented till the disease feels the influence of the remedy; but in large doses this salt will be found to nauseate, to create weight and pain in the stomach, attended by thirst, a white tongue, and a quickened and hardened pulse, symptoms which of course should be watched.

It has appeared to me to agree best when administered with dilute sulphuric acid, provided this plan is not otherwise contra-indicated. The following formulæ may therefore be adopted:—

℞ Quiniæ Sulphatis ℈j.
Conservæ Rosæ q. s. ut fiat pilulæ xx. quarum sumatur una vel duæ ter die cum haustu sequenti.

℞ Decoct. Cinchonæ f℥iss.
Acic. Sulphur. Dilut. ♏xv.
Syrup. Aurant. f3j. M.

The compound infusion of roses of the Pharmacopœia is an elegant vehicle for sulphate of quinia.

℞ Quiniæ Sulphatis gr. ij.
Infus. Rosæ Compos. f3xj.
Tinct. Cort. Aurant.
Syrupi ejusdem, āā f3ss.
M. fiat haustus bis die sumendus.

It is presumed, in these preparations of cinchonia and quinia, that we possess all the activity of the respective barks, unincumbered by inert matters, which nauseate the stomach and load the bowels in cases where large and continuous doses are requisite; and experience, as far as it has gone, seems to justify this opinion. The most severe test of the virtues of cinchonia seems to be the case of intermittent fevers, and the most obstinate agues have been very effectually treated by

sulphate of quinia. In very delicate constitutions, and in many of the diseases of children, these remedies also promise to be of essential service.

RED BARK is the produce of the *Cinchona oblongifolia :* it occurs in flat and quilled pieces, covered with a reddish brown epidermis, and internally of a fibrous texture, and a rusty red tint. It tastes more astringent but less bitter than the yellow park, and has not the peculiar aromatic austerity of pale bark. It contains both cinchonia and quinia. This bark is scarcely used medicinally, though the decoction is a very good astringent febrifuge.

It may be observed in regard to the above varieties of cinchona, that their infusions all redden delicate vegetable blues, a property which appears to be derived from a peculiar acid to which the term *kinic acid* * has been applied, and which is combined with the cinchonia and quinia, so as to form acid salts.

CINNAMOMI CORTEX—*The Liber or Inner Bark of the Laurus cinnamomum.*—CINNAMOMI OLEUM—*The essential Oil of the above Bark.*—Cinnamon is well known as a warm, sweet, and pungent aromatic. It is found in trade of very different qualities, the best being nearly as thin as paper, breaking splintery, and of a yellow brown colour ; other varieties are coarser and thicker, break shorter, and are considerably less pungent and sweet. This is especially the case with the Chinese cinnamon. The finest cinnamon is imported exclusively from Ceylon, though it also thrives in Malabar, Sumatra, and the Eastern Islands, and has been cultivated in the Brazils and elsewhere.

The principal use of cinnamon is as an accompaniment to other medicines, especially those which are nauseous, bitter, or flatulent upon the stomach ; at the same time we often avail ourselves of its warmth and astringency in bowel complaints, and here the tincture is a good form. In common diarrhœa, for instance, connected with dyspeptic acid, three tablespoonsful, three or four times a day, of the following mixture rarely prove ineffectual.

* This appellation so associates itself in the mind with kino, that I should suggest the term *cinchonic acid* as preferable.

℞ Misturæ Cretæ f℥v.
Tinctur. Cinnam. f℥j. M.

The genuine *oil of cinnamon* is exceedingly hot, aromatic, and sweet, but its flavour, when a little diluted, is singularly rich and agreeable, and very different from that of oil of cassia, which is sometimes substituted for it, and with which it is occasionally adulterated. It sinks in water. It is chiefly imported from Ceylon; and in doses of from four to eight drops, rubbed down with sugar and yolk of egg, and mixed with a little cinnamon-water and wine, it forms an agreeable and powerful stimulant, as in the following mixture:—

℞ Vitelli Ovi No. j.
Olei Cinnamomi ♏xx. Misce optimè, et adde
Vini Albi (Madeira or Sherry)
Aquæ Cinnamomi ää f℥iij.
Aquæ distillatæ f℥ij.
Sacchari purif. ℥ij.
Misce. Sumantur cochlearia tria ampla pro dosi.

COCCUS—*Coccus Cacti—Cochineal.*—This valuable insect is imported from Mexico and New Spain, where it feeds on several species of *cactus*. It is small, rugose, and of a deep mulberry colour; and except in the males, which are scarce, the head is not to be distinguished from the body: they are without wings, and very sluggish and torpid. They are scraped from the plants into bags, killed by boiling water, and then dried in the sun; those insects are preferred which are plump, dry, and of a silvery appearance.

The great consumption of cochineal is by the dyers of scarlet cloth. In pharmacy its principal use is as a colouring material, and as such is added to several tinctures. It has been recommended as allaying the spasmodic action in whooping cough, especially when administered with carbonate of potassa; but its efficacy is at least very doubtful, and generally discredited.

The principal adulteration to which cochineal is liable, is the admixture of a manufactured imitation composed of coloured dough. These spurious grains are detected by the action of boiling water, which dissolves and disintegrates them, while it has little action upon the genuine insect.

COLCHICI RADIX ET SEMINA—*The recent Root, and the Seeds of the Colchicum Autumnale, or Meadow Saffron.*—This is a hardy perennial, found in meadows, and bearing a purple flower in September; its bulbous root then decays, and the new bulbs are in greatest perfection from early in June to the middle of August. They then contain an acrid milky juice, in which Messrs. Pelletier and Caventou have detected a peculiar salifiable body which they call *veratrine*, and to which they ascribe the acrimony and efficacy of the plant. Vinegar and wine are its best solvents. "To preserve the virtues of the plant, the bulb, as soon as possible after it is dug up, should be cut into transverse slices not thicker than one-eighth of an inch, and dried by placing the slices upon clean white paper, distinct from each other, without heat, or at a very low temperature. The test of the drug being good and properly dried, is the appearance of a blue colour on rubbing it with a little distilled vinegar and alcoholic solution of guaiacum. The slices also should not appear deeply notched, or panduriform, as this is the mark of the bulb having begun to empty itself for the nourishment of the young bulbs, and consequently to suffer in its medicinal powers from the chemical change which at this period its contents must necessarily undergo for the nourishment of the offsets. It should be kept in slices in well-stopped bottles*."

Colchicum seems originally to have been recommended as a diuretic in dropsical affections, but as such it is very whimsical and uncertain in its action. In gout it may almost be called a specific, for it very rarely fails to break up the paroxysm, sometimes acting upon the bowels, at others upon the kidneys and skin, and often without any apparent accompanying effect. In acute and chronic rheumatism it is also a valuable remedy; a single dose will often allay obstinate pains of the joints and tendinous expansions. Small doses frequently repeated are sometimes preferable, and if they operate favourably they generally increase the secretion of urine, and remove the red sediment which in such cases it usually deposits when cold.

Some attention is requisite as to the form in which colchi-

* London Dispensatory, 1822.

cum is administered. Sir Everard Home ascribes much of the griping and nauseating effect that sometimes follows the use of the wine, to the sediment which forms in it, and which may be removed without injury to the specific effect of the medicine.

The Pharmacopœia prescribes a wine and a vinegar of colchicum, the former being much stronger than the latter, and most inconveniently prone to decomposition. Acids appear to render the operation of colchicum violent and drastic; whilst alkalies produce a milder but not less efficacious operation; and the acetic tincture, or even the wine, may with great propriety be administered with magnesia. About ɱxx. of the *vinum colchici* may be regarded as a medium dose, and may be taken when the paroxysms of pain are violent; the evening is the best time for its administration, and the following is a good form :—

℞ Vini Colchici min. xxv.
Magnes. Carbon. ℈j.
Aquæ Cinnam.
Aquæ āā f℥ss. M.

Mr. Thomson observes, that of the saturated vinous infusion made by macerating an ounce and a half of the *dried* bulb in twelve ounces of white wine, from thirty to sixty minims may be taken whenever the patient is in pain. The London Pharmacopœia directs the fresh root, probably under the apprehension of its being carelessly dried; but it must be remembered, that if the fresh roots be not used as soon as removed from the earth, the process of vegetation goes on, and their qualities are nearly as effectually changed as if they had remained buried.

The celebrated specific for gout, known under the name of *Eau Médicinale d'Husson*, is a vinous infusion of colchicum.

A vinous infusion, or tincture of the *seeds* of colchicum, has lately been recommended by Dr. Williams, of Ipswich, as possessing the virtues of the root without many of its pernicious qualities. Its influence upon the gout appears as certain as that of the root, whilst it is less liable to purge and nauseate.

COLOCYNTHIDIS PULPA—*The Pulp of the Bitter Apple, or Cucumber—The Fruit of the Cucumis Colocynthis.*—This trailing plant is a native of Turkey and Nubia. The fruit when ripe is about the size of an orange; it is imported dried, and generally peeled. The dried pulp is white, very light and spongy, and almost entirely soluble in water, forming a mucilaginous and intensely bitter solution, which, evaporated to dryness, furnishes the *extractum colocynthidis* of the Pharmacopœia, a preparation very rarely employed, and indeed rendered useless by the compound extract, which is a valuable purge. When given alone, colocynth, in the form of powder or extract, is apt to be very drastic and violent in its operation, producing inflammation of the bowels, bloody motions, and other untoward symptoms.

The *extractum colocynthidis compositum* is a very judicious and useful combination of purgatives, and may be administered either alone or with calomel. The average dose is from five to ten grains, which seldom fails to clear the bowels in two or three copious evacuations. If administered in insufficient doses, it is apt to gripe and nauseate, and the bowels remain disturbed till a larger dose, or some other purgative, is given.

The greatest difference will be found in the activity of this extract, obtained from different sources; half a drachm of one sample being sometimes less purgative than ten grains of another. This arises either from carelessness in its preparation, as when it is burnt; or inattention to the goodness of its ingredients; or not unfrequently to fraudulent substitution of some of its components. It is said that the seeds of colocynth are sometimes substituted for an equal weight of pulp; if so, the extract must be much less active, as the seeds, though their extract is purgative, yield very little of it. That colocynth pulp which is dense and deep grey, or dirty brown, is unhealthy, or has been injured in drying.

CONII FOLIA ET SEMINA—*The Leaves and Seeds of the Conium maculatum, or common Hemlock.*—This is a very common umbelliferous biennial, flowering in June and July. Its stem is mottled with brownish purple spots, and the leaves are of a dark green colour upon their upper surface, paler beneath, and emit when rubbed a strong and peculiar odour,

which has been compared to that of cat's urine. The ripe seeds of hemlock are smooth and brown.

The leaves should be collected for pharmaceutical use just before the plant flowers, and the stalks having been picked off, they should, if intended for powder, be carefully dried, either by exposure to sun and air, or in a very moderately heated stove. In this state they may be preserved in green glass bottles; or the powder may be kept in closely stopped opaque phials. If intended for extract, the leaves should be bruised in their freshest state, and the juice expressed and immediately evaporated.

Hemlock is a powerful narcotic, and often very serviceable as a substitute for, or accompaniment to, opium. In allaying morbid irritability of the system, attended by any local or general excess of vascular action, as in certain stages of phthisis, in the coughs that are apt to hang about patients who have suffered from pleurisy or peripneumony, in glandular tumours, and unhealthy sores, hemlock is generally preferable to opium. It has also been found of use in chronic rheumatism, and especially in whooping-cough.

The best forms of its exhibition are the powder of the dried leaves, and the extract; these may also be united. They may be given in three to five grain doses, repeated three or four times a day till they produce tranquillity; they sometimes admit of being augmented to twenty grains, but the dose must be modified according to the effect produced; and if nausea and a tendency to vertigo should ensue, it must be forthwith reduced.

The following pills are very effectual in allaying common cough and pulmonary irritation, and three or four of them may be taken at bed-time to relieve the restlessness occasioned by rheumatic or other local pains:—

℞ Extract. Conii,
Pulv. Ipecac. compos. āā gr. v.
M. ft. pilulæ duæ horâ decubitûs sumendæ.

An over-dose of hemlock produces giddiness, wandering of the mind, dilated pupil, convulsive motions of the muscles of the face, stupor, and the other symptoms of this class of poisons. These are said to be counteracted by vinegar and the vegetable acids.

Hemlock is occasionally applied externally to allay the pain of irritable ulcers and cancerous sores: sometimes it is singularly effectual; at others, it seems inert; and sometimes appears to increase irritation. The powder, mixed with a bread and water poultice, is the usual form of applying it.

CONTRAJERVÆ RADIX—*The Root of the Dorstenia Contrajerva—Contrajerva Root.*—This root is imported from South America and the West Indies, where it might safely remain without any loss to medicine. It is a warm bitter, and mixed with chalk forms the *pulvis contrajervæ compositum* of the Pharmacopœia, a preparation as useless as its basis.

COPAIBA—*The liquid Resin of the Copaifera officinalis*, vulgarly called *Balsam of Copivi.*—This liquid resin, obtained by wounding the bark of the tree, is imported from the Brazils in small casks. It has the consistency of oil, but is more viscid and glutinous; a pale yellow colour; a peculiar and somewhat aromatic odour, disagreeable only to those who have taken it as a medicine; and a pungent nauseous taste. Its specific gravity is .950. It communicates flavour to water shaken with it, and is perfectly soluble in about eight parts of alcohol, and in ether in any proportion. When rubbed upon paper and dried, it leaves an apparently greasy stain, but this differs from that of oil, by admitting of being written over with common ink. If adulterated with oil the stain would of course be truly greasy, but I have rarely met with any samples which I have seen reason to believe either spurious or sophisticated; though the appearance of the article as it occurs in trade differs considerably, yet this is probably owing to the circumstances under which it is collected.

The term *balsam* being now generally restricted to compounds of resin and benzoic acid, is not applicable to this substance; nor is it strictly a liquid resin, but a compound of volatile oil and resinous matter. When distilled, the former, which is highly odorous and pungent, and upon which the virtues of copaiba depend, passes over, and there remains an insipid resin in the retort, which has sometimes been employed in medicine under the name of *inspissated copivi balsam.*

Copaiba has long been celebrated in the cure of gleets, fluor albus, and other similar discharges unattended by active inflammation; and more lately it has been found effective in the relief of hæmorrhoidal affections. Its principal operation is diuretic, and in large doses it proves gently aperient. Where there is inflammatory action going on any where in the urinary canals, this medicine should be avoided; yet I have seen it of service in allaying the irritation and diminishing the secretion of red or uric sand.

It may be given in doses of from fifteen to forty drops twice or thrice a day, either upon water, or triturated into an emulsion by the aid of yolk of egg or gum arabic. One drachm has been administered three times a day in piles, and in this dose it generally purges. It is apt to nauseate, and I think more so when given in emulsion than when simply swallowed with plain water; but the effect may, in some degree, be prevented by the addition of some aromatic water to the emulsion of copaiba, as in the following:—

℞ Mucilaginis Acaciæ ℥iss.
Copaibæ ℥ss. tere simul et adde gradatim
Aquæ Menthæ viridis ℥j.
Tincturæ Capsici ♏v.
M. fiat haustus, bis vel ter quotidie sumendus.

CORIANDRI SEMINA—*The Seeds of the Coriandrum sativum—Coriander seeds* have a sweet and rather nauseous aromatic flavour. They are considered as carminative and stomachic; but the Materia Medica teems with preferable substitutes, and they might have been conveniently rejected.

CORNUA—*The Horn of the Cervus Elaphus: Stags' Horns.*—Hartshorn shavings yield to boiling water about one-fourth of gelatine. Four ounces boiled in a quart of water down to a pint, strained, and set aside to cool, yield a tremulous jelly, but the flavour is always somewhat disagreeable, and savours of glue. Jelly is a nutritious article of diet, but cannot be regarded as belonging to the Materia Medica.

CRETA—*Carbonas Calcis friabilis—Chalk.*—Prepared chalk, or that which has been cleansed and powdered by elu-

triation, has long been used in medicine as an anti-acid and absorbent, and is sometimes improperly termed an astringent. In conjunction with astringents, it relieves those diarrhœas which are excited by acid matter in the stomach and intestines. Chalk is sometimes useful upon the same principle that we administer magnesia, in calculous affections; but it is not often thus employed.

CROCI STIGMATA—*The Stigmas of the Crocus sativus.*—This is a perennial bulbous plant, probably a native of Asia, but cultivated for medical use in several parts of Europe, and in England, chiefly in Cambridgeshire and Essex. In September it bears a violet flower, the stigma of which is tripartite, of a very dark orange colour, and peculiar odour. The stigmas, separated from the rest of the flower, and carefully dried, form the *saffron* of commerce. Next to English saffron, that imported from France and Sicily is preferred to the Spanish, which is usually greasy and carelessly cured. The petals of marigold and of safflower are sometimes used to adulterate saffron; but they are detected by infusion in water, when they unfold, and are easily recognised. Saffron from which a portion of colouring matter has already been extracted is sometimes fraudulently blended with the genuine drug; it then has a dingy aspect, and yields a paler infusion than it should do. A kind of saffron compressed into cakes is also found in trade; it is very inferior to the former, and is chiefly used as a colouring matter by confectioners.

Good saffron should be of a very bright colour, not too moist, of a warm and slightly bitter taste, and a peculiar odour remarkably adhering to the clothes. Its aqueous and spirituous infusions should be of a bright and very deep golden yellow colour; sulphuric acid renders it blue, and nitric acid green: with other re-agents it assumes other colours; hence Bouillon la Grange considers it as a peculiar variety of vegetable extract, and calls it *polychroite*.

Saffron was once regarded as powerfully exhilarating and antispasmodic, and was especially famous for its supposed emmenagogue powers: "in one or two instances," says Dr. Cullen, "I have had some reason to believe in its power of

this kind, but in many other instances, though repeatedly employed in large doses, it has entirely disappointed my expectation *." The fact is, that from modern practice it has long been rejected, as a drug of no powers, and is now chiefly used as a colouring material in several tinctures, in aromatic confection, and in the syrup of saffron.

CUBEBA—*The Berries of the Piper Cubeba—Cubebs, or Java Pepper*, used to be employed in old pharmacy, and frequently occur in the voluminous prescriptions of ancient pharmacopœias. They have lately been restored to our Materia Medica, principally, if not exclusively, as a cure for gonorrhœa. They have much of the appearance of common pepper, but each berry has a short stalk attached to it; whence the term *piper caudatum*. Those which are large, heavy, plump, and of a fragrant odour, are to be preferred to the light, small, and inodorous. Their flavour is aromatic and bitter; but they have not the biting pungency of common pepper. According to Vauquelin, they contain a volatile oil, and resin, forming a compound not unlike copaiba balsam. They may be administered most effectually in the form of powder, and in doses of from one to two drachms, three or four times a day, in a wine-glassful of water: as proof spirit dissolves the efficacious parts of cubebs, the tincture may also sometimes be employed.

℞ Cubebarum contus. ℥iv.
Spiritûs Vini tenuioris oct. j.
Digere per dies septem, et per chartam cola.

Under this treatment there is generally an increased secretion of urine, which becomes deep-coloured, and acquires an aromatic odour. Cubebs seem to be most advantageously given in the early and acute form of the disease, moderating the pain and suppressing the discharge with almost specific certainty. According to Mr. Jeffreys†, the good effects of cubebs manifest themselves generally within forty-eight hours after the first dose; but unless material relief be obtained in the course

* Materia Medica, ii. 313.

† Observations on the Use of Cubebs, &c. London, 1821.

of five or six days, their continued administration is rarely to be recommended.

CUMINI SEMINA—*The seeds of the Cuminum cyminum —Cumin Seed* is imported from Sicily and Malta; its odour is very strong and peculiar; its taste aromatic and bitter. Neither cumin seed nor the *emplastrum cumini* of the Pharmacopœia, have sufficient importance to merit their retention in that work. Some kinds of cheese much esteemed in Switzerland are flavoured with cumin seed; to most persons, however, its taste and smell are disagreeable.

CUPRI SULPHAS—*Sulphate of Copper—Blue Vitriol.* —The persulphate of copper commonly met with in commerce is manufactured for the use of colour-makers and paper-stainers, and is usually sufficiently pure. It occurs in rhomboidal crystals, of a fine blue colour, a nauseous, metallic, and styptic taste, and soluble in about four parts of water, at 60°. It consists of

1 proportional of peroxide of copper.....		= 80.	....32.
2 ———————	sulphuric acid....	40×2 = 80.	....32.
10 ———————	water.....	9×10 = 90.	....36.
		250.	100.

This salt is administered internally as an emetic, and is chiefly useful in cases where the stomach has been paralysed by narcotic poisons. Thus, in cases of overdose of opium, it will often occasion vomiting where ipecacuanha and other emetics are ineffectual. The best mode of administering it is to dissolve half a drachm in six ounces of water, and to direct a third part to be taken every ten or fifteen minutes, until it operates. In very small doses it is sometimes prescribed as a tonic, especially in certain cases of epilepsy:—

℞ Cupri Sulphatis gr. iij.
Medullæ Panis ℥j.
Fiat massa in pilulas xxiv. dividenda, quarum capiat æger unam ter quaterve in die.

Even in these small doses, this salt of copper, if persevered in, as is generally necessary in the cases for which it is pre-

scribed, is apt to excite spasmodic pains of the stomach, an effect which may generally be counteracted by the addition of a quarter of a grain of opium to each pill.

In obstinate intermittents two grains have been given twice a day, with half a grain of opium, with manifest advantage; but it is a remedy that should not be resorted to on trifling occasions.

Externally, sulphate of copper is a useful escharotic, and, properly diluted, it is sometimes applied advantageously to foul and indolent ulcers, or as a styptic in external hæmorrhage. In ulcerated sore throat, where there is no material constitutional affection, the sores may generally be made to heal by touching them two or three times a day with a camel-hair pencil, moistened with the following solution:—

℞ Oxymel. simplicis f℥ss.
Cupri Sulphatis gr. v.
M. ft. solutio modo dicto applicanda.

CUSPARIÆ CORTEX—*The Bark of the Cusparia febrifuga—Angustura Bark.*—This bark is imported from South America, in flat and quilled pieces, breaking with a short and resinous fracture, covered with an ash-coloured epidermis, and internally smooth, and of a dull brownish-yellow colour. A spurious and poisonous bark, probably that of one or more of the species of *Strychnos*, is sometimes met with under the name of angustura; this is more intensely bitter, and in shorter and less regular pieces than the genuine; internally, it is nearly black, and externally covered with a rough rust-coloured epidermis.

Genuine angustura, or cusparia bark, has a strong bitter flavour, accompanied by a peculiar and somewhat aromatic pungency. Its odour is rather nauseous and fishy. Its chemical nature has not been accurately determined. I have failed in endeavouring to obtain from it a salifiable base, though it evidently contains a peculiar principle, analogous, probably, to that existing in cinchona. It is a valuable tonic, especially in cases of dyspepsia, with diarrhœa, and loss of appetite. It may be given in powder, in doses of ten grains, twice or thrice a day, or in infusion, or decoction. In cases of flatulency of the stomach, attended by nausea, five grains, with the same

weight of rhubarb, taken an hour before dinner, will often effectually restore the appetite and digestion.

This remedy was first brought into general notice by my father, who published an essay upon it, in 1791, particularly pointing out its beneficial effects in the treatment of dysentery and of chronic diarrhœa, especially that form of the disease to which persons who have long resided in warm climates are more particularly subject, and which often assumes, even in this country, more or less of a dysenteric aspect: in these cases, the powdered bark may be conjoined with some aromatic, if necessary, such as the *pulvis cinnamomi compositus*, or with the *pulvis cretæ compositus* of the present Pharmacopœia; or the following mixture may be prescribed:—

℞ Cuspariæ Corticis contusi ℥j.
Aurantii Corticis exsiccati ℥ss.
Aquæ ferventis octarium j.
Macera per horas quatuor in vase clauso et cola.

℞ Colati infusi f℥vij.
Tinctur. Cinnamomi,
Syrup. Aurantiorum āā f℥ss.
Cretæ præparatæ ℥j.
M. fiat mistur. de qua sumatur cyathus (cochlearia iij.—iv.) ter vel quater quotidie.

In the cure of intermittents this bark does not come into competition with cinchona; but in mixed and nervous fevers, and generally as a tonic, it is less apt to disagree with the stomach, and to run off by the bowels: it admits, in these cases, of the usual combinations with saline, aromatic, and antispasmodic medicines.

CYDONIÆ SEMINA—*The Seeds of the Pyrus cydonia—Quince Seeds.*—These seeds abound in mucilage, which is easily extracted by boiling them, previously bruised, in water. The viscidity of the decoction thus obtained, which exceeds that of mucilage of gum arabic, sometimes recommends it as an external application to excoriated surfaces; but it is very prone to become mouldy and sour, and hence, if employed, should always be freshly prepared.

DAUCI RADIX ET DAUCI SEMINA.—The London College has inserted the root of the *cultivated carrot*, and the seeds of the *wild carrot*, in the list of the Materia Medica. The former is sometimes used in poultices, and the latter have been recommended as a diuretic in cases of gravel. Though a carrot poultice is a very good poultice, neither one nor the other are entitled to the place which they occupy: it is not likely that the apothecary should keep carrots, and the seeds are not worth keeping.

DIGITALIS FOLIA ET SEMINA—*The Leaves and Seeds of the Digitalis purpurea, or Foxglove.*—This very common biennial plant grows in dry gravelly soils; and in June or July produces an elegant spike of bell-shaped flowers, bearing a little resemblance to a finger of a glove. The leaves, which are the part chiefly employed in medicine, have scarcely any smell, but a bitter and slightly nauseous flavour. They should be gathered just as the plant is about to blow; those which are not perfectly green and healthy should be rejected; the footstalks and the thick part of the rib of the leaves should be pulled off; and they should be dried at a temperature not exceeding 212°, so as to retain their colour, and appear of a tolerably lively green when powdered.

Foxglove is a most important article of the Materia Medica, and requires to be considered under two points of view—as a sedative, and as a diuretic.

The powers of this plant as a sedative are distinct and peculiar: it seems to act more *directly* as such than any other article of the Materia Medica; for we perceive no previous stimulation, nor are those other symptoms produced which usually attend the operation of narcotics. Its effects upon the pulse are extremely remarkable, and every way deserving of the most serious attention. Where it is full, hard, and frequent, it, in most instances, first reduces the fulness and hardness, and afterwards the number of pulsations in a given time. Dr. Baildon * brought down his own pulse from 110 to 40 beats in a minute. In a patient in St. George's Hospital, suffering under acute rheumatism, a very full,

* Lond. Disp., p. 287, note.

strong, and rapid pulse, of 130 in a minute, was first rendered soft and compressible, and afterwards fell, in the course of six hours, to 60 beats in the same period. In a patient suffering under phthisis, the pulse was lowered in 48 hours from 125 to 45 beats in a minute. But this remarkable effect upon the pulse is attended by other important symptoms, which have not, I think, been sufficiently dwelt upon by writers on the Materia Medica. Upon any sudden, and often upon any trifling exertion, the pulse immediately quickens, the heart throbs violently, nausea and fainting come on; and persons under the full influence of digitalis have not unfrequently died suddenly under such circumstances. Dr. Baildon found, that, when his pulse had been reduced to 40 beats in a minute, if he merely assumed the erect posture, it would rise to 100; when sitting up in a chair it was 72: the same effect, he says, was produced upon several other persons. The consumptive patient above adverted to got up in bed, in consequence of being suddenly seized with nausea, and his pulse, which half an hour before was 45, became too quick to count; he then fainted, and some ammoniacal stimulants were administered for his recovery, after which scarcely any pulse could be felt; it was alarmingly slow and feeble. A dropsical woman, 65 years of age, under the full influence of digitalis, fell in a fainting fit on walking across the room: she showed appearances of recovery, but vomiting and fainting again came on, and she died. I relate these from among many similar and well-authenticated cases, to show the necessity of the utmost precaution in the use of digitalis, and of the great care and attention which persons require who have been put under its full influence. It was formerly very incautiously used as a diuretic, without much reference to its sedative power; and such cases as the above, of fainting fits frequently recurring, and of sudden death, were not uncommon. When such symptoms as have been described come, as they often do, suddenly and dangerously on, they are best treated by small doses of ammonia and ether; paying, at the same time, the utmost attention to the perfect quiet of the patient, who should on no account be allowed to sit erect in bed, and still less to attempt to get up.

Such are the remarkable effects of digitalis, considered as a sedative, and they are seldom attended by any other prominent symptoms. The skin is usually moist, thirst is not complained of, the pulse occasionally may intermit; but that decided effect upon the brain which narcotics in full doses produce, is never eminently shewn by digitalis. In very large doses, where it has been intentionally administered as a poison, it soon produces excessive nausea, vomiting, and purging, cold sweats, delirium, repeated faintings, convulsions, first local and then general, and death.

As a diuretic, digitalis is chiefly to be depended upon in conjunction with other remedies, especially with squills and mercurials. Upon this subject, especially as relates to the theory of its action, the reader may advantageously consult Dr. Paris *. We may now, therefore, inquire into the indications which foxglove is calculated to fulfil, and the diseases in which it has chiefly been found efficacious.

Its singular effect upon the pulse naturally suggests its trial in inflammatory diseases, especially where bleeding has, perhaps, been carried to as great an extent as is consistent with safety, without effecting that entire reduction of symptoms which might have been hoped for. The question which here suggests itself is, how far the reduction in fulness and frequency of pulse which digitalis produces is equivalent, where any inflammation is going on, to the same effect produced by the lancet? To which the answer appears, from reference to various authorities, but especially to actual observation and experiment, to be, that in such cases digitalis is not to be trusted in; and although we may lower and soften the pulse, we do not at the same time produce corresponding effects upon the part in which the inflammatory action is going on. In other words, the effects of digitalis are perfectly distinct from those brought about by actually diminishing the quantity of circulating blood.

Foxglove has been recommended in active hæmorrhage, but the recommendation is, I think, a dangerous one; for if hæmorrhage should recur in a patient under its full influence, death would probably follow.

* Pharmacologia, vol. i., pp. 174 and 257.

Independent of its diuretic effects, digitalis is sometimes a very useful palliative to the most distressing symptoms of hydrothorax; but the cases in which the greatest and most decided benefit has resulted from its use, are those in which there appears to be some organic affection of the heart or larger blood-vessels. Hence, in *angina pectoris*, in some cases of aneurism, in violent and remitting attacks of palpitation, digitalis has proved a most valuable and effectual sedative. Of the necessity of the extremest caution in its use in such cases, and of most assiduously watching the various fluctuations of the patient, I need not again insist. Be it, moreover, always remembered, that in some constitutions the alarming symptoms are much more readily induced than in others; and that it is impossible to state, in any case, what precise quantity of the remedy must be administered to produce particular effects.

As a diuretic, digitalis has been much extolled in various dropsical affections; but its influence upon the pulse must not be overlooked, as it often has been, where thus administered; nor should it in any case, when diuretic effects are desired, be given alone, but rather as an auxiliary to other diuretics, which are certainly more operative in that state of the system which digitalis induces. I knew an instance of a person who suffered under anasarca of the legs, and who applied for relief at a dispensary, where he received a box of pills, one of which he was directed to take three times a day. On the evening of the third day he complained of great debility and faintness, and in the course of the night vomiting and frequent fainting fits came on: in the morning he died, upon attempting to get out of bed. This was evidently a case, perhaps a peculiar one, of poisoning by digitalis; it however shows the risk of carelessly administering it, and the necessity of attending to those peculiarities of habit which sometimes seem to render the system particularly open to its lowering and sedative influence. The pills were composed of two grains of digitalis, one of squills, and half a grain of calomel.

The best forms for the administration of digitalis appear to be the powder and the tincture; to these the Pharmacopœia adds an infusion.

Of the powdered leaves one grain may be given, in the form

of pills, twice a day, as an incipient dose, and it may be gradually increased by quarter-grains until some decided effect results; recollecting always, however, that its influence may come on suddenly, and that, without any previous notice, the pulse may, after the fourth or fifth dose, rapidly sink and bring the patient into a state requiring careful management. In the use of the tincture, precaution is equally necessary. As the prescription now stands in the Pharmacopœia, four ounces of the dried leaves are directed to be digested for fourteen days, without heat, in a quart of proof spirit: it is then to be filtered off for use. Of this tincture, thus prepared, about ten minims twice a day may be called an incipient dose, and it may be gradually and cautiously augmented by two minims daily, till it produces the desired action upon the pulse. It is sometimes customary, in pharmaceutical laboratories, to leave tinctures upon the dregs, after they have stood a due time, and gradually to pour off the clear part for use; the dregs are afterwards pressed out, and the last portion of tincture acquires, by this careless proceeding, double the strength of the first. A person suffering under hydrothorax, who had been in the habit of taking forty drops of tincture of digitalis every night, went from home without his medicine, and was obliged to send to an apothecary in the country for an ounce of the tincture, of which he took the accustomed dose: its effects were much more violent than usual; and he died, exhausted by repeated faintings, in the morning. Very particular enquiries were made respecting the quality of the tincture, when it appeared that the leaves had been shaken out of the bottom of the bottle in nearly a dry state, since an ounce of the tincture was with much difficulty squeezed out of them. Here, therefore, the strength of the tincture was not only increased by long standing, but probably very greatly augmented by evaporation; and there is little doubt that the patient died of the overdose, and not of his disease. Similar instances of carelessness in regard to tinctures are not uncommon; and they deserve severe censure, from the uncertainty of effect that must always ensue, and from the dangerous consequences that may, as in the above instance, follow.

There is another precaution, not only applicable to the use of digitalis, but also to that of other analogous and powerful

remedies. It is well known that their dose may often be augmented, by slow degrees, to a remarkable extent. A person habituated to opium will perceive no effect from a dose which would, perhaps, prove fatal to one who had never taken it. Doses of digitalis are borne by persons who have long used it, which could not have been given to them with impunity in the first instance. Hence persons often do themselves mischief by resuming their medicine, after some interval, in the same doses they had previously employed it. This observation particularly applies to patients who undertake the management of their own cases, and who erroneously suppose that a dose once taken may always with impunity be repeated.

The effects of digitalis, like those of other medicines, are sometimes singularly modified by peculiarities of the patient's habit: it has thus been administered in large doses without any corresponding affection of the pulse; sometimes it proves merely diuretic, and sometimes it acts as a brisk purge; but its general operation is that above described.

Digitalis has not been employed as an external application with any success; nor have any experiments hitherto enabled us to determine upon the nature of its active principle, which will, probably, be found analogous to that of the other narcotics. This is rendered further probable by the existence of nitrogen in foxglove, as shewn by the ammonia which is afforded by the destructive distillation of its extract.

The seeds of digitalis are of no use; not that they are deficient in activity, but that they are uncertain in their operation.

DOLICHI PUBES—*The hairy covering of the Pods of the Dolichos pruriens or Cowhage.*—This is a climbing perennial plant, native in the East and West Indies. The pods are covered with short reddish-brown spiculæ, which easily adhere to the fingers, and, if rubbed a little, occasion a most intolerable itching. An electuary, formed by dipping the pods in treacle, syrup, or despumated honey, and then scraping them, has long been used as an anthelmintic, especially for the removal of the *lumbricus teres*. The alimentary canal is protected by its secretions, but, as soon as the cowhage arrives at the worm, it prdouces excessive irritation, obliging

it to quit its hold; and, aided by a purge, it is usually expelled. But cowhage is often a very troublesome remedy, on account of the intolerable irritation it creates about the anus; and it is a vermifuge which, in this country, is scarcely ever resorted to.

DULCAMARÆ CAULIS—*The Stalk of the Solanum Dulcamara, or Woody Nightshade.*—The decoction of these stalks, which should be gathered in autumn, has a bitter-sweet taste, and operates both as a narcotic and diuretic. In very large doses it produces the usual symptoms of the narcotic poisons: I say nothing of the forms of its exhibition and doses, as it is a very uncertain and useless remedy. It has chiefly gained celebrity, as an article in diet drinks in certain cutaneous affections; and has also been recommended as efficient in the relief of chronic rheumatism; but it is entitled to no manner of confidence either in these or other complaints.

ELATERII PEPONES—*The Fruit of the Momordica Elaterium, or Wild Cucumber.*—This plant is cultivated exclusively for medical use. Its ripe fruit is somewhat of the shape of a small oval cucumber, covered with prickles. It falls from its stalk when fully ripe, and throws out its juice through the remaining aperture, whence the term, *squirting cucumber*. For medical use, they are gathered in September in rather an unripe state, the juice is *gently* expressed *, strained, and set by for some hours, during which it deposits a grey-green sediment, which, when carefully dried, is the substance not quite properly called *extract of elaterium* in the Pharmacopœia. It is generally sold under the name of *elaterium*;—it should be light and friable. According to Dr. Paris, it contains about one tenth of its weight of a peculiar principle to which its acrimony and activity are referrible, and which he terms *elatin* †. According to Dr. Clutterbuck ‡ forty cucumbers yield only six grains of genuine elaterium, which is

* The persons who cut and press these cucumbers generally suffer extremely from inflammation and ulceration of the fingers, and parts touched by the juice.

† Pharmacologia, ii. 203. ‡ Medical Repository, xii.

contained in the juice surrounding the seeds, and which is violently purgative in doses not exceeding one-eighth of a grain. But elaterium, as prepared according to the directions of the Pharmacopœia, seldom operates in less than half-grain doses, which may be repeated every two hours till they produce the desired effect. It is chiefly used in dropsical affections, and its operation is remarkable for the quantity of watery secretion which it brings away; but it should be administered with much caution, and by no means frequently, for hypercatharsis and unmanageable diarrhœa, attended by great debility, sometimes follow its injudicious exhibition.

ELEMI—*The resinous exudation of the Amyris Elemifera.*—Elemi is a yellow semi-transparent substance, of a slightly aromatic odour, and bitterish taste. It is not used internally, and enters into one preparation only, the *unguentum elemi compositum*, formerly known under the name of *yellow basilicon*.

EUPHORBIÆ GUMMI RESINA—*The gummy resinous exudation of the Euphorbia officinalis.*—All the species of euphorbia abound in an acrid milky juice. The officinal euphorbium is a native of Africa, and the *gum resin*, as it is not quite properly called, is imported in the form of small hollow tears of an intolerably acrid flavour. It is dangerously active as an emetic and cathartic, and may be considered as a virulent poison: hence it has long been rejected as an internal remedy; and externally as an errhine, it is so apt to occasion excessive irritation and swelling of the parts, that although it has sometimes been diluted with inert powders, and snuffed up the nostrils in cases of deafness, amaurosis, &c., it is now no longer employed even in this way. Why, therefore, is it retained in our Materia Medica?

FARINA—*Wheat Flour—The pulverised grain of the Triticum hybernum, or winter Wheat.*—This article rather belongs to the *Materia Alimentaria*, than to the Materia Medica. The uses of starch have already been adverted to under the head *Amylum*. Gluten, the other ingredient of wheaten flour, is that which confers upon it its peculiar tenacity when blended with water, and which especially fits it for the process

of panary fermentation in the manufacture of bread. The average composition of wheaten flour is—

Starch	77.
Gluten	20.
Inert matters	3.
	100.

FERRUM—*Iron—Ferri ramenta et fila—Iron filings and wire.*—These are the most convenient mechanical forms of iron for pharmaceutical use. It is necessary, however, to be careful that steel filings and wire are not substituted for those of pure or soft iron, since they are unfit for some important preparations.

Ferruginous compounds, of various kinds, have been very long used in pharmacy, and rank among the most valuable and effective of the mineral tonics. The metal is sometimes recommended in the form of fine filings, or powder, taking the chance of its meeting with some acid, or other matter, in the stomach, by which it may become oxidized, and thus be rendered active. To say nothing, however, of the mechanical mischief often done by metallic filings, it is surely preferable to exhibit the metal already oxidized, or in some of its soluble combinations, than to trust to the accidental solution of a portion of it in the stomach. Upon the whole, we may safely reject iron filings as a preparation for internal use. Perhaps the most certain and effectual form of iron is the protoxide or protocarbonate, as it exists in the *mistura ferri composita* of the Pharmacopœia, the dose of which is about an ounce and a half, once, twice, or thrice a day, as the case may require.

The *tinctura ferri muriatis*, the sulphate of iron, and what is called, in the Pharmacopœia, *ferri subcarbonas*, (little else than peroxide of iron,) are also among the useful chalybeates; while the *ferrum ammoniatum*, and its tincture, the new *vinum ferri* and *ferrum tartarisatum*, and, above all, the *liquor ferri alcalini*, are preparations which we may safely leave upon the shelf.

Iron seems to act as a general diffusible tonic; and where it so agrees as to admit of being given in sufficient doses, it augments the appetite, takes off flabbiness of the muscular

fibre, and is, by some, supposed to give a more florid hue to the blood; an opinion probably founded in error.

The cases best adapted for its exhibition are those of weak and languid habits, where the constitution is what is usually called *broken*, either by long-continued mental anxiety, excessive study, or bodily exertion beyond the strength, and generally after diseases which have necessarily received a very debilitating treatment, or which have left the body in a pallid, and, as it were, flaccid state, very susceptible of fatigue, and of morbid actions in general. But it must be remembered that where the preparations of iron are used after active inflammatory diseases have been subdued by the lancet, they not unfrequently favour sudden accessions of inflammatory action, and are apt to induce a local form of the disease, or chronic inflammatory action. When, therefore, the habit, under such circumstances, shews any symptoms of returning fulness of vessels, where thirst and a white tongue are associated with headach, and where the pulse hardens, chalybeates may generally be said to be contra-indicated.

In some painful and obstinate nervous affections the preparations of iron in large doses have been found of service; and in *tic douloureux*, Mr. Hutchinson says he has derived great benefit from the subcarbonate of iron given in doses of half a drachm to a drachm, twice or three times a day.

In certain stages of asthma, all the preparations of iron, but particularly the subcarbonate, appear, according to Dr. Bree*, eminently to lengthen the intermissions of the disease, by enabling the constitution to throw off gradually, but certainly, the causes of the morbid irritation in the stomach and in the lungs. In this view, he adds, it is entitled to a preference in the treatment of asthma, but not for the cure of the paroxysm merely, but of asthma itself.

To children of weakly constitutions, especially where there is a tendency to rickets, and perhaps some of the milder appearances of scrofula, chalybeates may be given with well-grounded hope of advantage. The old *vinum ferri*, uncertain as it is in its strength, is useful in such cases; but perhaps

* Practical Inquiry into Disordered Respiration, &c. 5th edit., 1815, p. 366. I cannot coincide with Dr. Bree in referring these beneficial effects to the evolution of oxygen from the oxide.

the best form of the remedy is the solution of tartarised iron, prepared according to the directions given by Mr. Phillips in his "Experimental Examination of the Pharmacopœia, 1811." This solution has but a slightly unpleasant taste, and may be rendered palatable by a little syrup.—(See *Ferrum Tartarisatum.*)

Where chalybeates nauseate, gripe, and purge, which they sometimes will do, proper counteracting remedies, especially aromatics and opiates, may be administered along with them. When given with astringent vegetable infusions, the inky appearance of the mixture is sometimes an objection to it, though not an important one. Quassia is one of the few bitters the infusion of which is not discoloured by iron. Where they produce constipation, they must be combined with saline or aloetic purges, as the cases require.

The best form for the administration of chalybeates is certainly in solution, not that but they may sometimes be added with advantage to pills. The tincture of muriate of iron is a very effective compound of this class, and may be given in doses of from five to fifteen or twenty drops twice a day. A glass of water is its best vehicle.

FILICIS RADIX—*Aspidium Filix mas—The Root of the male Fern.*—It has a bitter flavour, accompanied by a mucilaginous sweetness, and has been long used in doses of about two drachms, as a vermifuge. It is customary to follow it up with a brisk purge of calomel and gamboge, which is probably the most effectual part of the treatment; but we have many better anthelmintics.

Madame Nouffer's celebrated specific for the tape-worm consisted of two drachms of powdered fern root, and a calomel and gamboge pill; the former was taken in a cup of water, early in the morning, and the pill was administered two hours afterwards, and was aided in its operation by a subsequent dose of salts. Nothing but broth was allowed during the day, and if the worm was not expelled, the same series of remedies were repeated on the following day.

FŒNICULI SEMINA—*The seeds of the Anethum Fœniculum, or common Sweet Fennel.*—These seeds are uselessly

retained in the Pharmacopœia. They are a much extolled carminative among old writers, but dill and carraway seeds being already in the Materia Medica, these may safely be rejected.

FUCUS VESICULOSUS—*Bladder Wrack.*—This is a common marine plant, and when burnt to a coal or imperfect ash, furnishes a good substitute for burnt sponge. It has especially been exhibited in scrofulous affections, and in bronchocele, and probably derives its efficacy from containing a small portion of iodine.

Fresh sea-weed is frequently applied with advantage to indolent glandular tumours; it should be often renewed, so as to keep up a gently stimulating action upon the skin. —(See *Sodæ Murias.*)

GALBANI GUMMI RESINA—*The Gum-resin of the Bubon Galbanum.*—This is one of the family of fetid gums, at the head of which, and possessing their concentrated virtues, stands assafœtida. Under that article we have adverted to their general uses, and have only to remark in regard to galbanum, that it scarcely has sufficient pretensions to retain its place in the present Materia Medica. It forms an ingredient in the compound pills and compound plaster of galbanum; but is probably never prescribed alone.

GALLÆ—*Gall-nuts.*—These excrescences are produced by the *cynips quercus folii*, of Linnæus, a small insect which deposits its egg in the tender shoots of the *quercus infectoria*, a species of oak abundant in Asia Minor. When the maggot is hatched, it produces a morbid excrescence of the surrounding parts, and it ultimately eats its way out of the nidus thus formed, and makes its escape; but the galls should be gathered before this happens, for when the insect has decamped, they are less astringent and dense than before. The best galls are imported from Aleppo and Smyrna. Their taste is extremely astringent and somewhat bitter, their surface tubercular, and of a deep bluish-grey, or olive colour. Those which are light in weight and colour, and which instead of breaking dense and resinous are hollow and pulverulent, are

of inferior quality. Their principal active and soluble ingredients are tan and gallic acid, and they stand at the head of the list of vegetable astringents, though they are rarely employed. In relaxation of the soft palate and uvula, a gargle composed as follows, is often more effectual than the generality of astringent applications:—

℞ Gallarum contusarum ℥ij.
Aquæ bullientis f℥xij. infunde per horas quatuor et cola.

℞ Colati Infus. f℥vij.
Spir. Vini Rectificat. f℥j.
M. ft. gargarisma frequenter utendum.

In that form of hæmorrhoids called *blind piles*, the following ointments have been used with advantage:—

℞ Pulveris Gallarum ℥j.
Adipis præpar. ℥vij. M.

℞ Gallarum pulveris ℥j.
Camphoræ ℥ss.
Tinctura Opii f℥ij.
Cerati ℥j.
M. fiant unguentum partibus affectis nocte maneque applicandum.

GENTIANÆ RADIX—*The Root of the Gentiana lutea.*—This species of gentian is abundant in the Swiss and Austrian Alps, and in the mountainous forests of many parts of Germany, whence the roots are chiefly imported in contorted pieces of various sizes, covered with a brownish wrinkled epidermis. When broken, they exhibit a brown bark, surrounding an interior yellow and more fibrous part; they should be tough and flexible, and free from worms. The taste of gentian is purely and intensely bitter, accompanied by a slight sweetness, which in fine samples is very manifest on touching the tongue with the broken surface of the root. Its active parts are readily soluble in alcohol, and in water, having the properties of extractive matter.

Wherever simple bitters are indicated, gentian strongly recommends itself, and in the form of the compound infusion of the Pharmacopœia, conjoined with acids, alkalis, or saline

aperients, as the case may require, it forms an elegant and effectual tonic. The usual forms in which it is given, are the compound infusion and tincture. In dyspepsia, attended by acidity, the following draught may be taken twice a day, namely, at noon, and an hour before dinner :—

℞ Magnes. Carbonat. ℈j
Infus. Gentian. compos. f3xj.
Tinctura Cardamomi compos. f3j. M.

Where dyspepsia is attended by nausea, and aversion to food, the following is a good form :—

℞ Infus. Rosæ compos.
Infus. Gentianæ compos. āā f3vij.
Tinct. Gentianæ compos. f3j.
Acid. Sulphur. dilut. ℥xx.
M. fiat haustus ter die sumendus.

To this, half a drachm or a drachm of sulphate of magnesia may be added, where the bowels are costive.

Sometimes the extract of gentian is used in pills, but bitters do not appear to operate favourably under this form. The following, however, has been found a very useful remedy in cases of obstinate heartburn, with a gouty habit :—

℞ Extract. Gentianæ.
Ammoniæ Subcarbonat. āā 3j.
M. fiat. pilul. xxiv. Sumantur duæ bis vel ter die.

GLYCYRRHIZÆ RADIX—*The Root of the Glycyrrhiza glabra, or common Liquorice.*—This plant is abundantly cultivated for medical use, in the vicinity of London and elsewhere. The root is sometimes added to bitter and nauseous infusions, with a view of covering their disagreeable flavour by its sweetness; it is particularly effectual in this way in respect to aloes; its principal consumption, however, is in the preparation of extract of liquorice, of which a large quantity is imported from the south of Europe, under the name of *Spanish Liquorice:* it is usually burnt, and otherwise carelessly prepared, being a very different article from the genuine English extract of the same root. The chief use of this extract is the same as that of the root, and as a demulcent in coughs and colds.

GRANATI CORTEX.—*The Bark of the Fruit of the Punica Granatum, or Pomegranate.*—The decoction or infusion of this bark is a very powerful astringent, but it has nothing to recommend it in preference to galls, catechu, and several other similar articles of the Materia Medica. It is also employed as an injection in leucorrhœa, a gargle in relaxed sore throat, and a lotion in some cutaneous eruptions. In India the decoction is used as a remedy for tape-worm.

GUAIACI RESINA ET LIGNUM—*The Resin and the Wood of the Guaiacum officinale.*—In a short paper published in the Philosophical Transactions for 1806, I have shown that the substance usually called *guaiacum*, though possessed of many of the characters of the resins, is, in other respects, distinct and peculiar, and that it must be regarded as a body *sui generis*. Its most remarkable property is the change of colour which it undergoes when subjected to oxygenating agents. It is sometimes met with in tears, but its usual appearance is that of large fused masses with little smell and taste, brittle, and semi-transparent, and of a greenish brown colour. The tint of its recent powder is pale grey, but by exposure to air and light, it soon becomes of a dingy green; a change which Dr. Wollaston found was most speedily effected in the violet rays of the prismatic spectrum.

Guaiacum has long been esteemed a valuable remedy in chronic rheumatism, combined with diaphoretics and stimulants. The average dose is fifteen grains three times a day, conjoined with nitre, or, if requisite, with antimonials and opiates. It is best given suspended by mucilage of gum arabic, in the form of a draught, or as an electuary with honey.

The *tinctura guaiaci ammoniata* is also a favourite composition in rheumatism. The following are formulæ for the exhibition of guaiacum:—

℞ Pulver. Resin. Guaiaci gr. xv. tere cum
Mucilaginis Acaciæ ʒj. et adde
Potassæ Nitratis gr. v.
Aquæ Cinnamom. f3x.
M. fiat haustus ter die sumendus.

℞ Pulveris Resinæ Guaiaci ʒij.
——— Potassæ Nitratis ʒj.
Sulphuris Loti ℥ss.
Pulv. Zingiberis ʒj.
Mellis Despum. ℥ij.
M. fiat electuarium; sumat coch. j. min. quater die.

℞ Tinct. Guaiaci Ammon.
Mellis ää ʒj., tere simul et adde
Aquæ Pimentæ f℥j.
M. fiat haustus ter die sumendus.

Combinations of guaiacum are at all times liable to change their colour, but this is especially the case where it is combined with the *spiritus ætheris nitrici*, and they are frequently prescribed together, forming a perfect vegetable cameleon; a circumstance which should be explained to the patient, who may otherwise be alarmed at the non-identity of his medicine.

The wood of guaiacum only derives its efficacy from the resinoid diffused through it. Its decoction was at one time considered as a specific against the venereal disease, but experience has annulled its pretensions; nor does it deserve any confidence in cutaneous affections, except as a part of a diaphoretic regimen.

HÆMATOXYLI LIGNUM—*The wood of the Hæmatoxylon Campechianum, commonly called Logwood.*—This wood has a peculiar faint smell, and a sweet astringent taste: its chief consumption is as a dye-stuff. In the Materia Medica it ranks with the astringent tonics, and as such has been used in diarrhœa, dysentery, and dyspepsia. 20 grains of the extract may be given two or three times a day in an ounce and a half of chalk mixture. It frequently stains the stools of a deep blood red, or purple colour. Chevreuil has described the principle upon which the colour of logwood depends, under the name of *hæmatin* *.

HELENIUM—*The Root of the Inula Helenium, or Elecampane.*—This is a bitterish aromatic, a mere encumbrance

* Annales de Chimie, lxxxi. 128.

to the Materia Medica, which no practitioner ever prescribes. It has been analysed by Rose, who extracted from it a peculiar vegetable principle, which has been called *Inulin*. A more detailed analysis of the root was afterwards published by Funke*.

HELLEBORI FŒTIDI FOLIA—*The Leaves of the Helleborus fœtidus, or stinking Hellebore.*—This dangerously cathartic and emetic remedy is only retained in the list of Materia Medica as an anthelmintic, and who at the present day would think of using it as such?

HELLEBORI NIGRI RADIX—*The Root of the Black Hellebore.*—This also is a drastic and dangerous remedy. It has been tried in maniacal affections, but in these and other cases, less virulent and more manageable and certain remedies of the same class are equally effective. It is very rarely, and ought never to be, used.

HORDEI SEMINA—*The Seed of the Hordeum Distichon —Pearl Barley.*—Common is converted into pearl barley by a machine so constructed as to grind off the cuticle and afterwards round the grain. Its decoction, or what is generally called *barley-water*, contains little else than starch, 100 parts of barley being composed of 80 of starch, 6 gluten and gum, 7 sugar, and 7 husk. In this analysis Proust's supposed peculiar principle in barley, which he has called *hordein*†, is included with the starch.

HUMULI STROBILI—*The Strobiles of the Humulus Lupulus—Hops.*—The peculiar fragrancy and bitterness of hops resides chiefly in a pulverulent substance, which may be separated from them by the sieve, and which has been termed *lupulin*‡. Their effect in covering the nauseous sweetness of wort, and preserving beer, is well known. By

* Annales de Chimie, lxxvi. 98.

† Annales de Chimie et Physique, v. 337.

‡ This is usually known in the hop market under the term *condition*. According to Dr. Ives it contains tan, bitter extract, wax, and resin.—Philips's Annals of Philosophy, i. 194.

writers on the Materia Medica they are represented, but probably not on very sufficient grounds, as powerfully sedative and diuretic: it has even been asserted, that resting the head upon a pillow stuffed with hops, quiets the delirium of fever, and assuages the violent agitation of maniacal persons; all which may be believed by those who have been fortunate enough to witness such effects, but scarcely will be credited by those who have not had ocular proof. Upon the whole, the medical virtues of hops seem to have been extolled much beyond their merits; and if we allow them to be a slightly narcotic bitter, we grant them, perhaps, more than they deserve. As a direct and powerful sedative, they certainly are entitled to no confidence; and the Materia Medica abounds in tonics and bitters more effective than the preparations of hops, which it has been thought right to retain in the Pharmacopœia.

HYDRARGYRUM — *Quicksilver, or Mercury.*—A brilliant white metal, fluid at ordinary temperatures, but solid at 39° below 0 of Fahrenheit's thermometer; its specific gravity is 13.545. In its pure or metallic state, this metal is inactive; it has sometimes been absurdly administered in cases of obstinate constipation, in doses of a pound or more, in the hope of forcing a passage by its weight. If the intestinal canal were a straight and regular tube, such a plan might in some possible cases succeed; but its folly is too apparent when we consider the contortions and windings, the ascents as well as the descents of the passage. Mercury was also once celebrated as an alterative, and was much used by the ladies in Charles the Second's reign, in doses of a small tea-spoonful night and morning, to beautify the complexion, remove freckles, and perform the usual functions of cosmetics. It is even said, that in those days the sweepings of the drawing-room were among the most profitable of servants' perquisites, and that considerable quantities of second-hand mercury were thus collected.

The oxides, the chlorides, and the salts of mercury, are all more or less active, and they constitute a highly important class of compounds. Their chemical nature, and the methods of preparing them, will be adverted to under their respective

heads in the Pharmacopœia: at present I shall limit myself to a very brief notice of their composition, dwelling principally upon their uses in medicine, and upon the indications which they are calculated to fulfil in disease.

When, or by whom, mercury was first introduced into pharmacy, is not very evident; but, after the importation of the venereal disease from America, it soon came into general use as a specific against that disorder, and has since been employed as a valuable remedy in a number of other complaints: in short, the uses of mercury in its various forms and combinations are so numerous, that it is not easy to treat of them without becoming diffuse, or entering into tiresome repetitions. To avoid this as much as possible, I shall consider the general action of its oxides and chlorides, and afterwards notice such of the salts as are useful in particular cases, concluding with a general view of the influence of mercury upon the system. For other details the reader is referred to the second part of this work.

There are two oxides of mercury, the *black*, or *protoxide*, composed of 200 mercury + 8 oxygen; and the *red*, or *peroxide*, containing 200 mercury + 16 oxygen. Of these the former is among the most valuable preparations of the metal; it appears to be the active ingredient in the *pilulæ hydrargyri* or *blue pill;* in the *hydrargyrum cum creta;* and in the *unguentum hydrargyri*, or *mercurial ointment.* In its pure state it was formerly called *Ethiops per se*, and should correspond to the *hydrargyri oxydum cinereum* of the Pharmacopœia. The latter, or red oxide of mercury, the *præcipitatum per se* of old pharmacy, is a virulent and dangerous remedy when taken internally; it is now therefore almost, if not quite, limited to external use.—(See *the Preparations of Mercury.*)

The effects of protoxide of mercury upon the system deserve particular attention. In doses of two or three grains twice or thrice a day, it sometimes operates upon the bowels, not perhaps directly as a purgative, but indirectly, as modifying or increasing the secretion of bile; and where, from deficiency or morbid state of this secretion, the bowels are inert; where the digestion is impaired, especially that part of the process of digestion carried on in the small intestines; where the

countenance is sallow, and the tongue furred of a morning to an unusual extent, a dose of the black oxide of mercury night and morning, for two or three days, will often set all to rights. If the remedy be persevered in, and especially if its action upon the bowels be counteracted by opiates, it goes on to produce some febrile symptoms, a white tongue, a quickened pulse, and soreness of the gums, which become white and swollen, and the salivary glands especially partake of this stimulation, their secretion being notoriously and often excessively increased. This salivation and soreness of the gums may be kept under and modified, by reducing the dose of the mercurial; and it should never be allowed to run to any excess, though it is necessary that it should exist to a certain extent, as a proof that the system is duly affected by the remedy. Where a course of mercury, as it is called, is required, a better form cannot be resorted to than the *pilula hydrargyri;* it is certain in its effect, and it seldom affects the stomach and bowels when properly administered in such combinations as the particular case may require. Where, however, the alimentary canal will not bear this internal mercurial, its external application in the form of ointment, rubbed in in quantities of from half a drachm to two drachms every night, or every other night, as the symptoms indicate, must be resorted to. This is a very disagreeable, disgusting, and, generally speaking, unnecessary operation; and although mercurial friction used to be indiscriminately resorted to in almost all venereal cases, it is now in great measure superseded by milder treatment, and by the internal use of the remedy.

It sometimes happens that salivation is obstinately resisted, and that large and frequently repeated doses of the protoxide fail to make the mouth sore; but in such cases it will often be found that there is an excessive flow of urine, or that very abundant perspiration is induced, and these may be generally regarded as evacuations equivalent to salivation. Indeed, where salivation does take place, the last-mentioned secretions are commonly increased, for mercury, in this form, seems to act as a general glandular stimulant.

In a single dose of from ten to fifteen or twenty grains, according to the habit of the patient, conjoined with a little rhubarb, or a small quantity of aloes, the *pilula hydrargyri* forms a

good alterative purge, and repeated about once a week for two or three successive times, will seldom fail to cure that morbid state of bowels which is attended by white or clayey motions, and by lassitude, drowsiness, or general inactivity of the system.

The red oxide of mercury is not calculated to fulfil any indication which cannot be attained by the protoxide, and is extremely liable to act virulently upon the stomach and bowels, sometimes in doses of a single grain only: we should, therefore, recommend its exclusion from internal use. Applied externally, in the form of ointment, it is useful as a stimulating application to venereal and other sores; but whether we use it, or the *hydrargyri nitrico-oxydum*, great care should be taken that they are reduced to a very impalpable powder: in this state they are sometimes sprinkled upon the sore.

There are two chlorides of mercury—the *protochloride*, or *calomel*, consists of 200 mercury + 36 chlorine; and the *perchloride*, or *corrosive sublimate*, is composed of 200 mercury + 72 chlorine. In the Pharmacopœia these compounds are improperly termed *submuriate* and *oxymuriate of mercury*.

Calomel is not unfrequently used as an antisyphilitic, in the same way as the protoxide of mercury; and more especially combined with opium, when it salivates without purging. But its principal use in British pharmacy is as a purge, conjoined with other aperients; and for this purpose it is administered in doses of from two to six grains, combined with or followed by senna, cathartic extract, rhubarb, or other laxatives. The most customary form is five grains of calomel, in a pill, at night; and a draught composed of infusion and tincture of senna, with some saline aperient, early in the morning: for this purpose the common *black dose* is an effective prescription:—

℞ Magnesiæ Sulphatis ʒiij.
Infus. Sennæ compos. f3xiv.
Tincturæ Sennæ f3ij.
Olei Menthæ Piper. ℿiij.
M. fiat haustus laxans.

This is followed by two or three copious motions, abounding

in bile. In chronic hepatitis, in various glandular diseases, and in some cutaneous affections, calomel is celebrated as an alterative; and combined with diuretics, it singularly contributes to their activity. In these cases the usual dose is from a quarter of a grain to two grains, night and morning, modifying the dose, and that of the medicines combined with it, according to circumstances. Purgatives, including calomel, are also very effectual in a variety of febrile disorders; and in typhoid fevers they sometimes effect a surprising amelioration of the symptoms; but they must of course be administered, in such cases, with much caution, and under many limitations. In those febrile affections of children which are symptomatic of a disturbed state of stomach and bowels, purges of calomel and rhubarb are almost always effectual in affording relief; they usually bring away a large quantity of offensive mucus from the bowels, and where this is the case, they should be repeated in intervals of two or three days, till the motions assume a more healthy aspect.

The perchloride of mercury, or corrosive sublimate, was more frequently employed, as an internal remedy, formerly than at present. If given incautiously, it is apt to bring on a variety of dyspeptic symptoms, attended by continued or spasmodic pain of the stomach, and by diarrhœa: these effects are usually remedied by opium; and such a combination is sometimes employed to excite salivation, but the treatment is injudicious. Some difference of opinion has arisen respecting the antisyphilitic powers of corrosive sublimate; but the details of the discussions upon this subject are not very important, as no one would select corrosive sublimate for the exclusive cure of the venereal disease: not but that it is frequently an effectual adjunct to other mercurials, in the treatment of the flying pains and cutaneous eruptions which attend some forms of the disease.

The dose of corrosive sublimate, at the commencement, should not exceed one-eighth of a grain, and it is best administered in solution:—

℞ Hydrargyri Corrosiv. Sublim. gr. j.
Ammoniæ Muriatis gr. v.
Aquæ distillatæ f℥j.
M. fiat solutio.

℞ Hujus Solutionis f℥j.
Aquæ Pimentæ f℥j.
M. fiat haustus bis die sumendus.

To the above, a few drops of tincture of opium may be added, if the state of the bowels renders it necessary.

In conjunction with decoction of bark and of sarsaparilla, and with other vegetable decoctions and infusions, corrosive sublimate is often given as an alterative; and although it is more or less decomposed in the generality of these compounds, it remains an effective mercurial.

Applied externally, corrosive sublimate acts as a powerful caustic; but its solubility in water enables us to use it in any state of dilution, and to modify its strength according to the effects which it produces upon the ulcerated surface. It is sometimes employed for the relief of cutaneous eruptions, but is apt to do more harm than good. *Gowland's Lotion*, long celebrated in such cases, is a solution of corrosive sublimate in emulsion of bitter almonds, in the proportion of about a grain to an ounce. If applied in the form of ointment, great care should be taken to ensure the complete division and mixture of the sublimate, which is best effected by triturating it with twice its weight of muriate of ammonia and a few drops of water, then gradually adding the lard or ointment, and triturating the whole into an even mixture.

All these applications require to be used with much circumspection, especially upon delicate and irritable skins, where they sometimes excite erysipelatous inflammation, and a permanent redness of the part.

Calomel and corrosive sublimate are powerful engines in the hands of empyrics. In quack remedies for worms, calomel is a leading ingredient, conjoined generally with some drastic purge. Corrosive sublimate is yet more mischievously employed in those antivenereal remedies which are recommended as containing no mercury: its solubility, the small dose in which it is active, and the facility with which its taste is concealed, are qualities which recommend it in these cases; nor can the chemist easily detect it when thus disguised by syrups and other vegetable solutions.

The remaining mercurial preparations are not of sufficient

importance to require any individual examination in this place.

In respect to the *modus operandi* of mercury, we know little or nothing; it has neither been detected in the blood nor in the secretions; its effect upon the pulse is that of a decided stimulant, and as such it also operates upon the secretory and excretory organs in general.

Exclusive of the usual and common effects of mercury, we find that in particular constitutions, and indeed in all constitutions where mercury is improperly and incautiously used, it is sometimes accompanied by very peculiar and distressing symptoms. Pain in the bowels and purging commonly follow the use of mercury; but these sometimes run into a dysenteric affection, attended by tenesmus and typhoid fever. Sometimes, when least expected, a small quantity of mercury shall produce violent ptyalism; the salivary glands and tongue become swollen, the flow of saliva increases to an excessive height, and there is great wasting of flesh and loss of strength. In such a case, the treatment consists in keeping the patient in dry but cool and airy rooms, and the medicines to be employed are bark, acids, and astringents; we must at the same time guard carefully against the sudden suppression of salivation, which is always attended by consequences more or less dangerous.

There are some few constitutions that can scarcely bear mercury in any form; as soon as ptyalism commences, great depression of strength and spirits ensues, and there are frequent deep inspirations or sighings, attended by a very irregular pulse, and often by fainting: these symptoms are sometimes followed by a kind of ague, in which the cold fit appears to predominate in some instances, and which in others assumes the character, after a few days, of an inflammatory remittent fever, but the pulse remains small and quick; the stomach and bowels too are disordered; the countenance fallen and expressive of mental misery; there is a disinclination to all kind of exertion; and in this state the patient has almost suddenly expired. Where such effects attend the exhibition of mercury, it is almost unnecessary to remark that the use of it must be immediately discontinued, whatever may be the state of the venereal symptoms; a new

disorder has been created by the mercury; the patient must be used very gently as to food and medicine; and a milk diet and fresh air will commonly prove serviceable.

Much mischief is occasionally done by the incautious use of mercury in cases which are not venereal; and instances are on record in which ulcerated sore throat, eruptive disorders, and osseous or ligamentous tumours, have not only been greatly aggravated by mercury, but in which salivation has been pushed to such an injurious extent as permanently to ruin the already debilitated constitution. Among the lower order of persons, who consult empyrics and use their remedies, such cases are not unfrequent; and when we recollect the analogies that sometimes subsist between the mercurial and the venereal disease, we shall not be surprised at the occasional occurrence of doubtful and difficult cases in regular practice.

HYOSCYAMI FOLIA ET SEMINA—*The Leaves and Seeds of the Hyoscyamus niger, or Henbane*—A common plant, flowering in July. The corolla is pale yellow, beautifully striated with fine purple lines. In their recent state, the leaves have a very peculiar nauseous odour, and a bitter taste, both of which qualities are much impaired by drying.

Henbane has been very long used as an anodyne, and it is a valuable remedy of that class; the extract obtained from the juice of the leaves is by far the best form in which it can be exhibited; it derives its activity, according to M. Brandes, from the presence of a peculiar salifiable base, which has been called *hyoscyamia*.

Henbane, when given in sufficient doses, operates as a decided narcotic, and, in its general effects, much resembles opium, but it does not constipate; on the contrary, its tendency is rather to relax the bowels. It generally increases the flow of urine and the perspiration, and, in over-doses, brings on those symptoms which are occasioned by hemlock. The infusion, or solution of extract of henbane, applied to the eye, dilates the pupil in the same way, but less certainly than belladonna. As the strength of the extract varies, the proper dose must be learned by trial, from two to five grains at bed-time generally proving effectual: some gid-

diness and nausea are apt to follow a full dose. The cases in which it is found useful are those in which opiates are indicated, and in which opium disagrees, either by producing headach, sickness, or costiveness. Sometimes it may be usefully combined with opium, as also with hemlock.

The combination of narcotics with purgatives is not generally commendable, for the activity of both is apt to be destroyed: to this, however, there are some exceptions, and the griping and irritating tendency of colocynth is found to be greatly mitigated by the addition of extract of hyoscyamus; whilst its energies as a purgative, though thus rendered more mild, are not less efficacious *. With opium the case is, as we might expect, very different, in consequence of its constipating tendency.

Independent of its more ordinary uses, I have found it of much service in allaying the irritation occasioned by red sand in the kidneys, the constipation produced by opium being in such cases very prejudicial: it may be administered with alkaline and diuretic remedies. In chronic rheumatism, henbane with mercurial alteratives have effected a cure. In its general action it appears to approach nearer to opium than any other article of the Materia Medica.

The seeds of henbane are considered as partaking of the general properties of the herb, but there appears no adequate reason for encumbering the Materia Medica with them.

JALAPÆ RADIX—*The Root of the Convolvulus jalapa, or Jalap.*—This species of convolvulus is named from Xalappa, a city of Mexico. The root, which, when fresh, abounds in a milky juice, is imported in irregular globular pieces, and their sections and slices: it should be dense, and of a resinous fracture, exhibiting a brownish grey interior, and a concentric arrangement of its layers. Its odour, especially when in powder, is very characteristic; its taste, exceedingly nauseous, accompanied by a sweetish bitterness. Those pieces which are light, spongy, pale-coloured, worm-eaten, and inodorous, should be rejected, as either injured or spurious.

* Upon the authority of Sir Henry Halford, as referred to by Dr. Paris.—(*Pharmacologia*, vol. i. p. 277.)

Jalap is the most valuable of the drastic purgatives, and the best form for administering it is in powder or tincture; the extract is apt to be uncertain in its operation. In doses of from five to twenty grains of the powder, it usually produces several watery motions, commonly with some griping, and an increased flow of urine. Where the intestines are to be thoroughly evacuated, it may be united with other remedies of the same class, as with scammony, senna, &c.

℞ Pulveris Jalapæ gr. xv.
Calomel. gr. v.
M. fiat pulvis ex quovis vehiculo idoneo sumendus.

℞ Pulver. Jalapæ ℈j.
Infusi Sennæ c. f℥j
Tinctur. Sennæ f3j.
M. fiat haustus purgans.

These are very effectual purges for evacuating the bowels of school-boys who have over-eaten themselves; they sometimes nauseate and even vomit, but enough usually remains behind to purge also.

The diuretic qualities of jalap are much increased by combining it with supertartrate of potassa; and an electuary, composed as follows, is sometimes advantageous in dropsy :—

℞ Confectionis Sennæ ℥ij.
Pulver. Jalapæ 3j.
Potass. Supertart. Pulv. ℥ss.
Syrup. Zingiber. ℥j.
M. sumat cochl. j. min. bis vel ter die.

Or the following draught may be taken two or three times a day :—

℞ Tincturæ Jalapæ f3ij.
Aceti Scillæ 3j.
Aquæ Menthæ Viridis f℥iss.
Fiat haustus.

IPECACUANHÆ RADIX—*The Root of the Callicocca Ipecacuanha.*—This important article of the Materia Medica

is the produce of South America. Several varieties of it are occasionally met with, but that which is preferred is imported in bales from Rio Janeiro: it is in short, wrinkled pieces, covered with a grey-brown epidermis, and having a central woody fibre, surrounded by a pale grey cortical part, which breaks short and resinous, and in which its virtues reside; the larger, therefore, its relative proportion, the better. This root has a peculiar musty, nauseous odour: its taste is repulsive and bitter. It is difficultly reducible to powder, and the dust which it throws off whilst under the process of pulverization is apt to excite great irritation of the respiratory organs: indeed some persons are so susceptible of this influence of ipecacuanha, that they can scarcely enter a room in which the drug is.

Ipecacuanha is calculated to fulfil a variety of purposes in physic. It is the only vegetable emetic to be depended upon, evacuating the stomach certainly and completely, without any material consequent debility, and being milder and safer in its operation than the generality of such medicines. For this purpose the dose is from fifteen to twenty grains of the powdered root, in about an ounce of any aromatic water. In ten or fifteen minutes it nauseates, and when the stomach begins to be convulsed, and not before, draughts of warm water or chamomile tea should be swallowed to promote its operation, and thoroughly to wash out the contents of that viscus. If the powder be taken in a large quantity of liquid, or if warm water be too copiously swallowed immediately after the emetic, vomiting is apt to come on too rapidly, and the contents of the cardiac portion of the stomach only are thrown off, while the pyloric end escapes the evacuation. Where an emetic is administered for the mere purpose of emptying an overloaded stomach, we cannot do better than use the above; but, if exhibited at the commencement of fevers, with a view of blunting their violence, or cutting short their progress, and especially if given upon the accession of the cold stage of an intermittent, it is well to combine a grain of tartarised antimony with fifteen of ipecacuanha: this extends the duration of the nausea and of the vomiting, and tends more decidedly to promote perspiration.

℞ Antimonii Tartarisati gr. j.
Pulveris Ipecacuanhæ gr. xv.
Aquæ Menthæ Viridis f3xj.
Syrupi Croci f3j.
Fiat haustus emeticus.

Such an emetic is indeed highly proper in the early stage of many diseases, and cannot be too strongly recommended at the commencement of inflammatory sore throat, of quinsey, and especially of laryngeal and tracheal inflammation.

Where there is decided fulness of the cerebral vessels, and in cases of hernia, of passive hæmorrhage, and in advanced pregnancy, it is scarcely necessary to remark that all emetics are obviously contra-indicated.

The taking of an emetic is sometimes followed by suppression of urine. Dr. Heberden mentions such a case in a young woman *, and I have seen one other in which it appeared that scarcely any urine was secreted for nearly twenty-four hours after the vomiting.

In doses of from one to three grains, ipecacuanha may be so managed as merely to nauseate, and in this way it has been found useful in certain obstinate diarrhœal and dysenteric affections. In still smaller doses, for instance a quarter of a grain to a grain every three or four hours, it proves diaphoretic and expectorant; and in the latter sense is a valuable remedy in inflammatory catarrhal affections, more especially of children, to whom the wine of ipecacuanha may be given in doses of from five to twenty drops. In these smaller doses also, that is, barely to nauseate, it is found to lessen the impetus of the circulation, and hence is said to be of service in active hæmorrhage.

Conjoined with opium and nitre, or with saline aperients, as in the *pulvis ipecacuanhæ compositus*, or *Dover's powder*, ipecacuanha forms an important diaphoretic, and the properties of both medicines appear to be modified by combination; for the ipecacuanha may thus be given in larger doses without nauseating, and the opium is not so apt to constipate and produce headach and vertigo. Sometimes a very profuse

* Commentaries, 3d edit. p. 284.

perspiration is induced by the above formula, when aided by warm drinks; it has thus gained deserved celebrity in acute, and some forms of chronic rheumatism, and in a variety of cases where relief is obtained by sweating. In respect to chronic rheumatism, it deserves to be recollected, that it is very frequently relieved by an emetic; a plan which I have known effectual in some long standing and very painful and obstinate cases.

A nauseating dose of ipecacuanha frequently adds to the activity of purgative medicines, and is occasionally conjoined with them where determination to the surface is also required.

℞ Pulveris Ipecacuanhæ gr. iij.
Pulveris Jalapæ gr. xv.
Calomelanos gr. ij.
Fiat pulvis ex quovis vehiculo idoneo sumendus.

The powder and the wine of ipecacuanha seem to be the only necessary forms of this drug for practical use. MM. Magendie and Pelletier have, however, succeeded in separating from ipecacuanha its active principle: it appears to be a peculiar vegetable substance, to which the term *emetina* may be applied. This substance may be procured in a state sufficiently pure for pharmaceutical use by the following process. Boil powdered ipecacuanha in twice its weight of sulphuric ether, in a distillatory apparatus, for a few hours, returning the ether which passes over into the retort as occasion may require. Having poured off and set aside this ethereal solution, which chiefly contains wax, digest the residuary ipecacuanha in four times its weight of highly rectified alcohol, filter off this alcoholic solution, evaporate it very slowly to dryness, and macerate the alcoholic extract thus obtained in cold distilled water as long as it exerts any action; lastly, filter off this aqueous solution, and evaporate it carefully to dryness. The extract thus afforded is *emetine*, and the best ipecacuanha yields about 20 *per cent.* of it in this state. It is highly emetic, but cannot be safely depended upon as a substitute for ipecacuanha; although, therefore, with a heap of other novelties, it has a place in the Paris Pharmacopœia, it seems very doubtful whether it will ever be much used in British practice.

JUNIPERI BACCÆ ET CACUMINA—*The Berries and Tops of the Juniperus communis.*—The market is chiefly supplied with juniper berries from Italy and Germany; the former being the larger and finer looking, but not always yielding so much oil as the latter. Their taste is sweet, mucilaginous, and warm and aromatic; when distilled they yield about 5 *per cent.* of a fragrant volatile oil, possessing much of the flavour of oil of turpentine, with which the foreign oil of juniper appears generally to be pretty copiously adulterated. Genuine *hollands* derives its flavour from juniper berries, but in English gin oil of turpentine is the usual substitute.

The diuretic and sudorific virtues of juniper berries and tops are to be ascribed solely to their essential oil, which is therefore sometimes combined with other diuretics, especially in the form of pills. The following, for instance, generally influence the secretion of the kidneys, and are therefore prescribed in that part of the treatment of anasarca and ascites which has for its object the increase of aqueous excretion through that channel:—

℞ Scillæ Rad. Pulver. gr. ij.
Pulv. Foliorum Digitalis gr. j.
Pilulæ Hydrargyri gr. vj.
Olibani Pulver. ℈ss.
Olei Juniperi ♏iv.

Fiat massa in pilulas quatuor dividenda, è quibus capiat ij. hora somni, superbibendo haustulum misturæ sequentis.

℞ Baccarum Juniperi contus. ℥vj.
Carui Semin. Contus. ℥ij.
Aquæ ferventis oct. j.

Macera per horas tres et cola.

℞ Colaturæ f℥xij.
Spiritûs Juniperi compositi f℥ij.
Potassæ Nitratis ℈ij.
Syrupi Scillæ f℥ss.

Fiant mistura, de qua sumatur cyathus cum pilulis et subinde.

KINO.—In the Pharmacopœia of 1809, kino is called the "*gum resin* of a nondescript African tree;" in that of 1815, it is termed the "*extract* of a nondescript African tree;" and in the recent edition of 1824, it is said to be the extract of the

pterocarpus erinacea. The Edinburgh College informs us that it is obtained from the *eucalyptus resinifera;* the Dublin College pronounces its source to be the *butea frondosa;* and Dr. Duncan regards it as the extract of the *coccoloba urifera.* Mr. Thomson * has clearly proved that the varieties of kino known in commerce differ considerably from each other; yet Dr. Paris remarks, "that the plant which yields kino is at length satisfactorily proved to be the *pterocarpus erinacea.*" Such is the conflicting evidence concerning the origin of this drug.

Kino, as it usually occurs in the trade, is in small fragments, exhibiting a brilliant fracture, and of a very deep reddish-brown colour. It is slightly sweet, and very astringent when chewed. Water at 60° dissolves about half of it, and alcohol nearly two-thirds: the latter solution having a rich brown colour. The leading components of kino appear to be tan and extract, probably united with a portion of gum and resin. Its use in pharmacy is exclusively as an astringent, in doses of from ten to twenty or thirty grains of the powder, or one to two drachms of the tincture; but it is not more effective than catechu, and liable to vary in its composition; so that it is very sparingly employed.

Speaking of the uses of opium, in union with astringents, in the treatment of pyrosis, Dr. Pemberton † observes, that kino is generally to be preferred, because, unless there is diarrhœa present, it appears to have no tendency to confine the bowels. "In this drug," therefore, he adds, "you have a medicine which exerts its powers to restrain the discharge of the glands when they are secreting too much, without exerting any such powers over the glands when they are acting naturally." And again, he remarks, "that it is not difficult to conceive that an astringent shall be able to contract a vessel, already too much relaxed to its natural standard; but that the same astringent shall be unable to contract it further. If this be allowed, we have the advantage of possessing an agent which shall restrain the unnatural secretion of a gland, but which shall cease to act when this purpose is obtained. Whether such be the true method of accounting for this peculiarity, or

* London Dispensatory, 1822, p. 347.

† On Diseases of the Abdominal Viscera, p. 108.

whether it may arise from the insolubility of kino, except in a quantity of fluid, I do not pretend to determine; but I can with confidence assert, that the effect of kino will be found such as I have above stated."

It appears to me that the greater number of the purer vegetable astringents possess this character; and that under the ordinary circumstances of a healthy state of stomach and bowels, their tendency is not to constipate: indeed, in their capacity of tonics, they often relieve habitual costiveness, apparently by increasing the muscular action of the alimentary canal.

KRAMERIÆ RADIX—*The Root of the Krameria triandra, commonly called Rhatany Root.*—This root abounds in astringent matter, and is said to be employed in the adulteration of Port wine. The tincture, which is the preparation chiefly used in medicine, has nothing to recommend it in preference to the other astringents in which the list of the Materia Medica abounds.

LACTUCA SATIVA—*The Garden Lettuce.*—This plant, especially when in flower, abounds in sap, which becomes milky by exposure to air, and dries into a brown substance, having in taste and smell some resemblance to opium, and being, like that drug, narcotic. The dose of this substance, which has been called *lactucarium*, is from one to five grains, in the form of pills: or from ten to sixty drops of a tincture composed of one ounce of lactucarium and a pint of proof-spirit. It is recommended to allay the irritating cough in phthisis pulmonalis, and may be tried as a substitute for opium and other narcotics. Mr. Thomson says that it contains morphia.

Lettuce is perhaps the least indigestible of all the raw vegetables which are eaten at table, and is often taken with impunity by dyspeptic patients. In such cases it is well known that small doses of opium are frequently effectual in promoting digestion, and it is not improbable, as has been suggested by Dr. W. Philip*, that this may be referrible to its anodyne quality.

* On Indigestion, 4th edit. p. 198.

LAVANDULÆ FLORES—*The Flowers of the Lavandula spica.*—These are rather to be regarded as a perfume than a medicine. The essential oil is obtained by distilling lavender flowers with water, in the proportion of about one pound from fifty to seventy pounds of the flowers: it is extremely fragrant, and, dissolved in alcohol, constitutes one of our most agreeable perfumes. Of course it ranks with the stimulants of the Materia Medica. In point of fragrance none of the foreign oil of lavender comes into competition with that distilled in England; and the plant is very abundantly cultivated in the vicinity of London for that purpose. The oil which passes first over has the highest and most perfect scent, and is frequently kept separate, and sold at a proportionate price. When the stalks and leaves are distilled with the flowers, the odour of the oil is considerably deteriorated, and this appears generally to be the case with the foreign oil.

LAURI BACCÆ ET FOLIA—*The Berries and Leaves of the Laurus nobilis, or Bay Tree.*—The only active ingredient in laurel leaves is prussic acid; and what has been said under the head of *bitter almonds* applies in some measure to laurel leaves, and to the water distilled from them. But the oil of bitter almonds is the only requisite form of vegetable prussic acid for pharmaceutical use: hence laurel, and all that belongs to it, may well be rejected from the Materia Medica.

LICHEN ISLANDICUS.—The active components of *Iceland moss* are a bitter matter, and a peculiar modification of mucilage. The former may be separated by digestion in cold water, or by boiling for a few minutes; then, by a continued decoction, the mucilage is extracted. These ingredients render Iceland moss tonic and nutritive; but it appears to possess no other claims upon our attention, and certainly cannot be admitted as having any pretensions as a specific in phthisis pulmonalis.

LIMONES—*Lemons—The Fruit of the Citrus medica*—LIMONUM CORTEX—*Lemon Peel.*—Lemon juice is a powerful antiscorbutic, and, as an agreeable acid, is in common use in cooling drinks. The external rind of the fruit

contains a particularly pleasant essential oil, which is a good adjunct to bitter and nauseous medicines. It should only be used fresh.

The following are the proportions of the ingredients in lemonade:—

Fresh Lemon-Juice 4 ounces,
Fresh and very thin Peel of Lemon half an ounce,
White Sugar 4 ounces,
Water 3 pints.

The water should be poured boiling upon the other ingredients, in a covered vessel, and strained off when cold; it may then be iced if necessary. A drachm of nitre is sometimes a good addition to the above, when it is used as common drink in fevers.

LIMONUM OLEUM—*The Essential Oil of the External Rind of the Lemon.*—This is largely prepared in Italy and other parts of the South of Europe. Its chief use is a perfume, and it is a good addition to sulphurated and other disagreeably-smelling ointments. Its flavour is infinitely less agreeable than that of lemon peel, for which therefore it cannot be used as a substitute. It frequently tastes and smells so strongly of turpentine, as to lead to a suspicion of adulteration with that essential oil.

LINUM CATHARTICUM—*Purging Flax.*—This is a common plant in dry pastures, flowering from June to August. Two drachms of the dried herb to a pint of boiling water, affords an infusion of which two or three ounces is a dose, and which generally purges briskly; but it has nothing to recommend it in preference to numerous other articles of the Materia Medica, and is probably never used in regular practice. Why, therefore, is it retained in the new Pharmacopœia?

LINI USITATISSIMI SEMINA—*The Seeds of common Flax—Linseed.*—These seeds abound in mucilage and fixed oil; hence, when powdered, they form an excellent poultice; but the *linseed meal* in common use is the powdered cake remaining after the expression of the oil, an ingredient of much

consequence in a cataplasm. The mucilage is easily extracted by boiling water, and is sometimes used as a demulcent or vehicle for other remedies.

MAGNESIÆ SUBCARBONAS.—The substance thus called *Subcarbonate of Magnesia*, is, in fact, an hydrated carbonate of magnesia, as will be shown when treating of its preparation, for it has a place in the present Pharmacopœia, both in the Materia Medica and among the preparations and compounds: its chemical properties, and the methods of preparing it, will be described under the latter head. It is usually found in the shops in the form of a light white powder, tasteless and inodorous. In doses of from twenty grains to one drachm, it has long been employed in medicine, as an effectual neutraliser of acid in the stomach, and as operating, at the same time, gently upon the bowels: its activity as an aperient depends, however, very much upon the acid and other matters with which it meets in the *primæ viæ*. In the febrile affections that attend dentition, and in the aphthous fever of children, magnesia and saline remedies are often effectual in allaying the symptoms.

There is no application of magnesia more important than in cases of *uric* or *red sand;* those cases in which the alkalies are generally used, but in which they frequently disagree or fail. It may here be administered in doses of twenty or thirty grains twice or three times a day, and except it has gone to a great height, or has continued so long as to have become, as it were, habitual, it will usually check the increased secretion of uric acid; the red deposit in the urine becomes much diminished, or altogether disappears, and the irritation of the kidneys is proportionately relieved. It must not be forgotten, that in cases of *phosphoric*, or *white sand*, magnesia and other alkaline or antacid medicines are mischievous. In all cases of the continued administration of magnesia, its tendency to lodge and accumulate in the bowels must be prevented by the occasional uses of aperients; for cases have occurred in which very serious mischief has resulted from such accumulation.

Small doses of carbonated magnesia are often effectual in cutaneous eruptions, and especially in those breakings out of

pimples about the chin, nose, and forehead, which are symptomatic of acidity in the stomach.

Magnesia may be administered in water or milk, in any aromatic water or conjoined with bitters. The latter are proper in dyspeptic cases, and a little compound spirit of ammonia is frequently a useful adjunct.

℞ Magnes. Subcarbonatis 3ss.
Infus. Gentianæ compos. 3x.
Spirit. Ammoniæ compos. 3ss.
M. fiat haustus, ante prandium et vesperi sumendus.

In calculous affections magnesia may be given in any of the above vehicles, or we may use its solution in carbonated water, which is manufactured by several of the soda-water-makers, and sold under the name of *aërated magnesia water*, a pint of which, containing a drachm of magnesia, or more if required, may be taken daily.

The dose of pure magnesia may be about one-third less than that of the carbonate; it is given, in other respects, in the same way: it is only to be preferred where the carbonate creates flatulency.

Citrate of magnesia, extemporaneously prescribed, is by no means a disagreeable aperient, especially when a little excess of lemon juice is used.

℞ Magnesiæ Subcarbonatis 3j.
Succi Limonum recentis f 3iij.
Syrupi Tolutani,
Spiritûs Myristicæ, āā f 3j.
Aquæ distillatæ f 3ix.
Fiat haustus.

This draught may be rendered more active, though less pleasant, by the addition of two drachms of sulphate of magnesia: it then forms what is sometimes technically called the *white dose*.

MAGNESIÆ SULPHAS—*Sulphate of Magnesia—Epsom Salt—bitter purging Salt.*—This is the most generally used, and the best of the saline aperients. In doses of from half an ounce to an ounce of the crystallised salt, it proves actively purgative, especially if taken in a sufficient quantity

of liquid; and in smaller doses, repeated two or three times a day, it may be conveniently given with tonics, to keep up a gentle action upon the bowels. It admits of being blended with magnesia or its carbonate, and acids may also be united with it; indeed one of the commonest and most elegant vehicles for Epsom salt is the infusion of roses. Infusion of cascarilla, and infusion of gentian, with or without the addition of dilute sulphuric acid, may also be used; and these bitter medicines cover, in a considerable degree, the more nauseous and unpleasant bitterness of the salt. Neither ammonia nor carbonate of ammonia precipitate the magnesia from this salt under common circumstances; their preparations, therefore, may be blended with it; and where spasmodic pains and nausea follow its use, they are often prevented by the addition of half a drachm or a drachm of compound spirit of ammonia.

If it be desired merely to evacuate and wash out the *primæ viæ*, four or six drachms of sulphate of magnesia, taken in a large half pint of warm water, early in the morning, generally proves effectual; two or three copious watery motions follow. But where the bowels are loaded with viscid mucus, such a purgative, although operating very freely, is far from cleansing them; and in such cases recourse must be had to a preliminary dose of calomel and cathartic extract, or some purge of a more searching description; and the saline purgative must be aided by others, as in the common *black dose*:—

℞ Magnesiæ Sulphatis ℥ss.
Infusi Sennæ compos. f℥iss.
Tincturæ Sennæ,
Syrupi Zingiberis, āā f℥j.
Spiritûs Ammoniæ compos. f℥ss.
Fiat haustus purgans.

It by no means follows that the bowels have been *emptied* because a dose of salts has apparently performed its full duty; it may leave much offending matter behind, and symptoms may not subside, as far as they are connected with such a residuum. Thus it is that the bowels are often drenched with mineral saline waters, which, though very active, are quite ineffectual in the relief of disorders that are presently cured

by other purgatives, or by judicious combinations of them with saline aperients.

Sulphate of magnesia, and nearly all other saline purgatives, are in some persons apt to excite pain, and very troublesome flatulency of the stomach and bowels; an effect generally remedied, but not always, by combination with aromatics, spirituous stimulants, and volatile alkali.

It deserves notice, that very small doses of this salt, especially when conjoined with bitters, are effectively aperient in some habits subject to costiveness: it is generally necessary to precede its use in this way by a more active dose, and then the following may be given daily, at noon, or a couple of hours before dinner:—

℞ Magnesiæ Sulphatis ℥ss.
Infus. Rosæ compos.,
Infus. Gentianæ compos. āā f℥vj.
Acid. Sulphurici diluti ♏x.
Syrup. Zingiberis f℥j.
M. fiat haustus.

MALVA—*The Mallow—Malva sylvestris.*—A mucilaginous herb, neither useful in nor ornamental to the *Materia Medica.*

MANNA—*The concrete Juice of the Fraxinus Ornus, a species of Ash, native in the South of Europe, and especially common in Calabria and Sicily.*—It exudes spontaneously in dry and warm weather, and concretes upon the bark; but the manna we usually meet with, in long, flaky, and brownish or buff-coloured pieces, is procured by incision. Several varieties of manna occur in commerce; the purest, and that which ought only to be used, is called *flake manna;* the others are in smaller fragments, mixed abundantly with all kinds of impurities, and often, it is said, adulterated with sugar, honey, scammony, and other analogous articles. Fine manna is soft, and somewhat adhesive; its texture generally appears granular, but it also presents fasciculi of acicular crystals: its odour is slightly disagreeable; its taste sweet and nauseous.

Manna has now fallen much into disuse, and is chiefly employed in doses of a drachm or two as a mild and sweet aperient for children. In large doses it is apt to gripe and

inflate, without purging, and scarcely proves active with adults in a quantity less than two ounces.

The following aperient mixture, however, is occasionally ordered, and is a favourite with some practitioners:—

℞ Sodæ Sulphatis,
Mannæ opt. āā ℥j. solve, leni calore, in
Aquæ Menthæ viridis f℥vij.
Tincturæ Sennæ f℥j.
Fiat mistura laxans, cujus sit dosis cochlearia quatuor.

In some inflammatory diseases, especially those of the kidneys and bladder, where the bowels have been evacuated by a full dose of castor oil, the following is sometimes used to keep up a gentle aperient action:—

℞ Olei Amygdalæ,
Olei Ricini,
Mannæ optimæ, āā ℥j.
Aquæ Rosæ ℥x.
M. fiat haustus, sextâ quâque horâ sumendus.

MARMOR ALBUM—*White Marble*—is not quite properly inserted in the list of Materia Medica;—it is a useful source of carbonic acid, and is sometimes employed for other purposes in the pharmaceutical laboratory; but it is never medicinally administered. Its composition resembles that of *chalk*, (see *Creta*,) being composed of 28 lime and 22 carbonic acid.

MARRUBIUM — *The Marrubium vulgare, or white Horehound*—An article of about as much use as *malva*.

MASTICHE.—This is the resinoid exudation of the *Pistacia Lentiscus*. Mastic is chiefly exported from the island of Chios, and its principal consumption is among varnish-makers: about three-fourths of it are soluble in alcohol, and have the properties of a brilliant, brittle, and colourless resin; a viscid and elastic matter remains, in some of its properties not unlike caoutchouc; to this is owing the toughness which mastic assumes when chewed, and which renders it useful for stopping hollow teeth. The real medical virtues of mastic are very insignificant; but it is sometimes a good adjunct to pills—it envelopes their active matter, and thus renders them

less immediately soluble in the stomach, and consequently more progressive in their operation: upon this principle it forms an ingredient in the prescription at page 17.

MEL—*Honey.*—With some persons honey proves a tolerably active aperient, but its chief medical use is as a vehicle for other remedies, or a means of blending with and suspending insoluble substances in water.—(See *Tinctura Guaiaci Ammoniata.*)

MENTHA PIPERITA—*Peppermint.*—This indigenous perennial is abundantly cultivated in the neighbourhood of London for medical use. Its odour is not disagreeable, its taste pungent, and leaving an impression of coldness upon the tongue. By distilling either the dry or fresh herb with water, a considerable portion of a very odorous and pungent oil is obtained: its proportion varies exceedingly; in a warm, dry, and favourable season, a great distiller of the oil, near London, informs me that the produce of oil from a given quantity of the fresh herb is double that which it yields in a wet and cold season. The largest produce is three drachms and a half of oil from two pounds of fresh peppermint, and the smallest, about a drachm and a half from the same quantity. The quality of this oil is also very variable as to taste and odour, but it frequently improves considerably by keeping. There is a variety of peppermint, the foliage of which has a darker hue than the *green* herb commonly cultivated, and its essential oil always partakes of the flavour of pennyroyal, often to such an extent as leads to a suspicion of mixture or adulteration.

Peppermint-water is a useful warm vehicle for aperients, and for remedies intended to relieve flatulency, attended by spasmodic pain of the bowels. A drop or two of the oil is often added to purging pills with the same intention; and its solution in alcohol is a well-known dram.

MENTHA VIRIDIS.—This is common *Spearmint*, and the essential oil and distilled water obtained from it are used in the same way as those from peppermint. According to several writers on the Materia Medica, this variety of mint

only yields one five-hundredth of its weight of essential oil: like other aromatic herbs, however, it varies extremely in this respect.

MENYANTHES—*Menyanthes trifoliata, or Buckbean.*—The leaves of this plant, which is an indigenous perennial, are said to be diuretic and purgative; they are also bitter. The dried leaves have been given in powder, in doses of twenty or thirty grains, in intermittent fevers, in chronic rheumatism, and in some cutaneous disorders; it is, however, an article of uncertain efficacy, and may very well be dispensed with.

MEZEREI CORTEX—*The Bark of the Daphne Mezereum.*—This indigenous plant is well known as an ornamental shrub in our gardens. Its bark contains a very acrid sap, which irritates and produces a serous discharge when applied to the skin. The fruit is also very acrid and poisonous; and unfortunately its tempting appearance is such as sometimes to induce children to swallow it; in which event an emetic should be given as soon as possible, followed by demulcent drinks.

Infusions and decoctions of mezereon of bark have been recommended in chronic rheumatism, in some cutaneous disorders, and in certain venereal affections: but it is a remedy much too uncertain to merit the eulogies that have been bestowed upon it.

MORI BACCÆ—*The Fruit of the Morus nigra—Mulberries.*—A very grateful fruit, forming the basis of an elegant syrup, but very liable to ferment.

MOSCHUS—*A peculiar concrete substance, the produce of the Moschus Moschiferus, or Musk Deer.*—This animal inhabits the mountains of Eastern Asia, especially the Himalayan chain. Behind the navel is a bag which, in the adult animal, is filled with musk. These bags are imported from China, and, in inferior perfection, from Bengal and Russia. They are covered with coarse hair, and are about the size of a

large pigeon's egg. Musk, originally a viscid fluid, concretes on drying into a brown friable solid, the strong, peculiar, and highly diffusible odour of which is well known.

Musk is placed among the stimulant antispasmodics of the Materia Medica; but much difference of opinion exists as to its efficacy; and its high price and extreme liability to adulteration are, independent of any other objections, circumstances against its employment. It has been strongly recommended in all spasmodic diseases, but seldom had recourse to except in obstinate and peculiar cases, where more ordinary remedies have been tried in vain. Mr. Thomson speaks highly of a combination of musk and calomel in epilepsy, and attributes the disappointment which has generally attended its use to the remedy having been adulterated, or to the smallness of the dose. He gave half a drachm four times daily*. The *mistura moschi* of the Pharmacopœia is not an eligible form for the administration of musk. It is best given in pill, bolus, or electuary, or in a very small quantity of liquid, united with other antispasmodics or stimulants.

℞ Moschi ℈j.
Camphoræ (ope Spt. Vin. pulverisat.) gr. v.
Confect. Rosæ Gall. q. s. ut fiat bolus.

℞ Moschi ℈j. ad ʒss.
Mucil. Arabic. ʒj. tere simul, et adde
Mistur. Camphor. fʒiss.
Spirit. Ammon. compos. fʒj.
M. ft. haustus pro re nata sumendus.

The adulterations of musk are not very easily detected, and among them the admixture of dried blood, which is said to be most frequent, is that which it is most difficult to recognise. In these cases it is necessary to possess a genuine specimen of fine musk, and, by comparing our samples with it, to judge of their quality. If, when burnt, it exhale a strong smell of burnt horn, we may suspect that blood has

* Lond. Disp. 1822, p. 392.

been added; for the odour thus exhaled by genuine musk, though it partakes of, yet differs from that of burnt blood. If it fuse when heated, asphaltum, or some other bituminous or resinous substance, has probably been mixed with it. Earthy matter, shot, and clippings of lead, are sometimes found in it; and sometimes the bags themselves, as well as their contents, are not genuine. As I have before observed, careful comparison with genuine musk best enables us to judge in these matters.

MYRISTICÆ NUCLEI—*Nutmegs—the Kernel of the Fruit of the Myristica Moschata.*—This tree is a native of the Molucca Islands; its fruit is about the size of a nectarine, and includes the kernel or nutmeg, which is covered by its own shell, and this by what is called *mace*. When the fruit is gathered, the mace is separated and dried in the sun; the nutmegs are then gently baked, taken out of their shells, and washed in lime-water.

The general qualities of the nutmeg are well known, and its medical properties are those of the aromatic stimulants.

It is said sometimes to occasion drowsiness, and the symptoms produced by narcotics; and Dr. Cullen has related such a case: the dose taken was two drachms of powdered nutmeg*.

Both mace and the nutmegs afford an essential or volatile, and an expressed oil. According to Spielman, nutmegs yield one-sixteenth their weight of essential oil, and about one-third of their weight of expressed or fat oil. The oil of mace, as usually imported, is wrapped in flag leaves; it is of the consistence of marrow, an orange colour, and slightly fragrant. The only use made of it is as an ingredient in the *emplastrum picis compositum*, where it might as well be omitted. It is probably generally adulterated; and it is said to be commonly composed of suet, palm oil, and a little of the genuine oil to give it odour.

MYRRHA—*Myrrh—The Gum Resin of an unknown*

* Cullen's M. Med. vol. ii. p. 204.

tree, said to be a native of Abyssinia and Arabia Felix.—It is chiefly imported from Turkey, in the form of irregular tears and their fragments, of a reddish-brown colour, more or less translucent, a fragrant aromatic odour, and a warm pungent taste. It is sometimes largely mixed with other gummy resinous substances; with bdellium, which is dark-coloured, opaque, and nauseously bitter; and with a pale and nearly transparent gum, which has not the characters of myrrh. Resin and gum, in the relative proportions of about 34 to 66, with a little essential oil, appear to be its components; but these are very various in different samples.

The principal medical use of myrrh is as a tonic, and it is a very good one. It may be given in doses of from ten to twenty grains, either in pills, or triturated with any aromatic water, in the form of a draught: it is an excellent adjunct to carbonate of iron, in the *mistura ferri compos.;* and may be united with aloes and chalybeates as an emmenagogue; and with cinchona or other bitters as a general tonic. Such combinations are particularly adapted to leucophlegmatic and torpid habits, for myrrh is a warm and gently stimulating remedy; it improves the appetite, and generally agrees well with the stomachs of debilitated persons. In union with expectorants, it is often resorted to in asthmatic and catarrhal affections, and in certain stages of phthisis pulmonalis, when the debility from expectoration is considerable, and where it is not rendered inadmissible by any febrile or inflammatory symptoms of magnitude. The following is a good expectorant formula, from Dr. Paris's Pharmacologia:—

℞ Myrrhæ Gum. Resin. ℥iss.
Scillæ exsiccatæ ℥ss.
Extract. Hyoscyam. ℈ij.
Aquæ q. s. ut fiant pilul. xxx., è quibus sumantur binæ nocte maneque.

The following pills are often convenient where a combination of tonics and aloetics are indicated; but if kept too long they are apt to become hard and insoluble, and consequently often nearly ineffectual:—

℞ Ferri Sulphatis,
Potassæ Subcarbonat. āā ℈j.
Myrrhæ Pulver. ʒj.
Aloës Pulver. ʒss.
M. et divide in pilulas xxx.; ij. vel iij. pro dosi nocte maneque.

In cases of nervous debility, the following will sometimes be found an effectual formula:—

℞ Tinctur. Myrrhæ ℥ss.
Spirit. Ammon. compos.,
Syrupi Croci, āā ʒij.
Mistur. Camphor. ℥v.
M. fiat mistura, de qua sumantur cochlear. iij. bis vel ter die.

OLIBANUM—*A Gum Resin produced, according to the London Pharmacopœia, by the Juniperus Lycia.*—Mr. Thomson, however, on the authority of Mr. Colebrooke, regards it as the exudation of the *Boswellia serrata* of Roxburgh, a native of the mountains of India. The finest olibanum is imported from the Levant, in yellowish-white and nearly opaque tears or drops, having a slight odour of turpentine, and a bitterish taste. When burnt, it diffuses a sufficiently agreeable fragrance; but it is of little importance as an article of the Materia Medica. It has been administered in doses of from twenty to sixty grains in gleets, but probably with very imperfect success; and though it was once celebrated as an expectorant, is now scarcely employed.

According to Braconnot, 100 parts of olibanum contain 8 of fragrant volatile oil, 56 of resin, 30 of gum, and 5 of a substance neither soluble in water nor in alcohol.

OLIVÆ OLEUM.—*The expressed Oil of the Fruit of the Olea Europæa—Olive Oil.*—The olive is cultivated in the South of Europe, the market being almost exclusively supplied with oil from Italy. The oil is expressed from the pulp of the ripe fruit; that which first flows is called *virgin oil*, and is inodorous, and nearly insipid, having only a slight

nut flavour. The residuary pulp, boiled and fermented, yields an inferior oil, which is mixed with that from the less perfect fruit, and exported, as well as some of the inferior oil, in casks, the former being exclusively preserved in large earthen jars, holding about twenty-four gallons each, or in glass flasks. The recent oil always deposits more or less of an albuminous sediment; and although the greater portion is separated previous to its exportation, there is always more or less sediment in the jars. The best olive oil, from Lucca, Florence, or Provence, is extremely bland and insipid; sometimes it has a slight acrimony and bitterness, said to arise from the unripe fruit. Its specific gravity is .916. It congeals at about 38°, and begins to be decomposed when its temperature is elevated to between 500° and 600°. It becomes rancid on keeping, especially when originally of an inferior quality, or adulterated with poppy oil. This adulteration renders the oil less easily congealable, and prevents its solidification by pernitrate of mercury, which, added to the genuine oil, forms a concrete compound in the course of a few hours.

Olive oil is not much used as an internal remedy, though it may be substituted, in any of the formulæ mentioned above, for almond oil. In the dose of half an ounce to an ounce, it is gently aperient, and is sometimes administered as an antidote to certain poisons; but in such cases it is rarely useful. The superficial application of this and other fixed oils to the body, is said to prevent the reception of plague, and to mitigate the symptoms of those suffering from the disease. Such inunction has also been recommended in ascites, but there is no evidence of its utility. As a vehicle for various active remedies, in the form of *liniment*, this oil is very useful; it impedes the evaporation of volatile substances, and retains other bodies in contact with the cuticle, so as to enable them to be absorbed. Upon this principle, liniments of ammonia, of opium, and of cantharides, are frequently prescribed.

OPIUM—*The concrete Juice of the unripe Capsules of the Papaver somniferum, or white Poppy.*—The pharmaceutical history of opium should include an account of its

sources, properties, and chemical composition; of its effects upon the animal economy, in its healthy and in its disordered state; of the various formulæ for its administration, and their respective doses; and of the treatment of cases in which it has been taken in excessive and dangerous quantities.

The white poppy is probably an original native of Asia, though by no means an uncommon indigenous plant in various parts of Europe. Opium is chiefly prepared in Turkey, Persia, and India; but the plant is also abundantly cultivated in France and the South of Europe, on account of its seeds, from which a useful bland oil is procured by expression.

The method of obtaining opium is sufficiently simple: the young plants are set out in rows, about six inches distant from each other, and are at first plentifully watered. When six or eight inches high, a rich manure is applied; and when about to flower, they are again profusely watered. The collection of opium commences when the seed capsules are about half-grown. At sunset two or three longitudinal incisions are made in each capsule, care being taken to avoid reaching the internal cavity; the exuding juice is removed as fast as it concretes, put into earthen pots, and ultimately dried in the sun; it is then formed into spherical masses, covered with poppy or tobacco leaves, and more completely dried.

Opium is found in the European market in flattish cakes, sprinkled with pieces of dried leaves, and with the seed capsules of some species of *rumex*. It should be of a rich brown colour, a tough consistency, and a tolerably smooth and uniform texture. Its peculiar narcotic smell should be strong and fresh, and unaccompanied by any burnt odour. Its taste is nauseously bitter, and slightly warm and acrid. Those pieces which are very soft, full of herbaceous impurities, containing patches of a very dark brown or black extract, of an empyreumatic odour, or not smelling duly narcotic, are in general adulterated; and it is not uncommon to find bullets concealed in masses even of the best opium. When good opium is carefully dried, it becomes brittle, and affords a yellow brown powder. It burns with flame, and exhales an odour in which may be traced some resemblance to that of animal matter.

The above are the characters of the most genuine opium which reaches this country, and which is imported from *Turkey:* an inferior article, of a much darker colour, a less narcotic odour, and more bitter in taste, is imported under the name of *East Indian opium;* it is frequently mixed with the Turkey opium, an article which, on account of its large consumption and high price, is open to a great variety of adulterations, both abroad and at home: indeed it is not probable that much unadulterated opium ever reaches this country.

Opium of very excellent quality has been grown in England; and in medicinal powers it has been found fully as effective as the foreign: but the coldness and changeable nature of our climate renders it unlikely that it should ever be produced here in any considerable quantity, so as even to supply a small part of the commercial demands for this drug*.

The chemical nature of opium has long been matter of inquiry; but it is only lately that the subject has been at all satisfactorily investigated, and that through the researches of Sertuerner†, Robiquet‡, and several other chemists, we have been made acquainted with the existence of a peculiar salifiable base in opium, to which the name of *morphia* has been given, and to which its activity as a narcotic may probably be exclusively ascribed.

Morphia, not in a very pure state, is copiously precipitated by adding ammonia to a strong aqueous solution of opium; but a better mode of obtaining it is to triturate powdered opium into a thin paste with acetic acid, and afterwards to add six or eight parts of water. The liquor may be filtered off through coarse paper, and the residue treated with a small additional portion of acetic acid and water, as before. Add excess of ammonia to the filtered liquors, which will occasion a precipitate, to be collected on a filter; evaporate the filtered liquor to about one-fifth its bulk, add a little more ammonia,

* A description of the mode of cultivating the poppy, and of collecting opium, as successfully practised in Somersetshire, by the Rev. Mr. Swaine, will be found in the Quarterly Journal of Science, vol. ix. p. 69. See also, upon the same subject, the 37th volume of the Transactions of the Society of Arts.

† Ann. de Chim. et Phys. v. 21. ‡ Ibid, 275.

and a second precipitate is obtained, which may be added to the former. These precipitates are impure morphia; they may be cleansed by digestion in small quantities of *cold* alcohol, which will remove the chief part of the colouring matter, and the residue being dissolved in boiling alcohol, furnishes crystals of pure morphia as the liquid cools.

In this process the salt of morphia (*meconate of morphia?*) existing in opium is decomposed by acetic acid, and a solution of acetate of morphia obtained, which the ammonia decomposes.

Robiquet's process for obtaining morphia is as follows. Boil a concentrated solution of opium for a quarter of an hour, with a small quantity of magnesia, (about 200 grains of magnesia to a pound of opium is sufficient,) filter and wash the grey precipitate with cold water, dry it, and digest it in warm but weak alcohol, by which much colour is dissolved; then collect it upon a filter, boil it in highly rectified alcohol, and filter the solution while hot; as it cools it deposits crystallized morphia.

In this process the meconate of morphia originally existing in the opium is decomposed by the magnesia, and the precipitate consists of morphia mixed with meconate of magnesia and a portion of uncombined magnesia. The morphia is separated from the precipitate by boiling alcohol.

It seems probable that in opium the morphia is combined with an acid, which, being in excess, gives to solutions of opium the property of reddening vegetable blues. This acid (the *meconic acid?*) may be obtained from the residuum of the magnesian precipitate left undissolved by alcohol in the above process for procuring morphia. For this purpose the magnesian residue is dissolved in very dilute sulphuric acid, and muriate of baryta added to the sulphuric solution: a red precipitate, consisting of sulphate and meconate of baryta, falls. This precipitate is to be boiled with very dilute sulphuric acid, by which the meconate of baryta is decomposed, and the meconic acid may be obtained from the filtered liquor by due evaporation. It may be purified by sublimation at a gentle heat. This acid has no narcotic effect.

By digesting opium in ether, and slowly evaporating the

filtered ethereal tincture, a crystallised substance, contaminated by a little oil and caoutchouc, is obtained, which is perfectly distinct from, and independent of, morphia. This is the substance which has been termed *narcotin*, and upon which the exciting and stimulating power of opium, which usually precedes its sedative effects, is by some supposed to depend. It is insoluble in water, soluble in alcohol, and not alkaline.

Morphia is a colourless substance, of a bitter taste, and crystallises in quadrangular prisms. It is very little soluble even in boiling water, but it dissolves in boiling alcohol, and the solution deposits crystals as it cools. It reddens turmeric, and converts vegetable blues to green, in the manner of an alkali; it also combines with the acids, forming with most of them crystallisable salts. The following is probably an approximation only to its ultimate composition:—

Carbon	72.00
Nitrogen	5.50
Hydrogen	5.50
Oxygen	17.00
	100.*

Pure morphia, in consequence of its difficult solubility, is uncertain in its operation as a narcotic; but some of its salts may probably be found useful substitutes for opium. The *acetate of morphia* is said to have been employed with advantage, and indeed *acetic tincture of opium*, which may be presumed to contain acetate of morphia, has long been used as a preparation less liable to stimulate and excite than most others of opium. It has also been supposed that some advantage may be derived by separating the narcotin from opium, which may be effected by washing the extract of opium before it is sufficiently inspissated, with repeated portions of sulphuric ether. We have, however, no very satisfactory evidence of any improvement in the medical effects of opium derived from such a process.

* See Quarterly Journal of Science, vol. xvi. p. 279, and Annales de Chimie et Physique, tom. xxiv. p. 163.

Exclusive of its active principles, opium contains inert extractive matter, gum, gluten, and a few saline substances, but these, as well as the morphia, vary extremely in their relative proportions, so that it is of little use to state those afforded by any individual sample of the drug. According to Mr. Thomson*, fine Turkey opium contains nearly three times the quantity of morphia yielded by the same weight of East Indian opium. From a very carefully prepared sample of English opium, I procured rather a larger quantity of morphia than from the same weight of Turkey opium. The average produce of morphia from a pound of good opium may be estimated at about 500 grains, or one-fourteenth its weight; but it is improbable that the whole is separated in any of our processes.

Opium stands at the head of the anodynes, sedatives, and narcotics. The mode in which it produces its effects has given rise to much discussion and controversy, all of a very unprofitable kind; and, without entering into the physiological hypotheses which have been invented to account for its action, I shall here only briefly describe the more obvious and prominent phenomena to which it gives rise.

The apparent effect of small doses of opium often partakes of that of a direct stimulant, rather than a sedative. It increases arterial action, exhilarates the mind, produces headach and heat of the body. But these effects are followed by a peculiar quiescent state of the system, which is more apparent after a full dose, when the stimulating power of opium is, indeed, scarcely observed. Under such circumstances, the pulse is rendered full and slow, the skin warm and moist, the mind tranquil, and pain is allayed. Sometimes a profound and quiet sleep follows, and, on awaking, the person feels animated and refreshed. But the sleep is often broken and disturbed by most disagreeable dreams; and, instead of refreshment, languor, giddiness, nausea, and drowsiness succeed; or, what is not uncommon, the opium produces a very tranquil state of body and of mind, without the smallest tendency to sleep, and yet without any subsequent debility or exhaustion. The secretion from the skin is generally some-

* Disp. 1822, p. 420.

what increased by opium, and sometimes considerably; but the other secretions are obviously diminished; the bowels, especially, become constipated, and the urine smaller in quantity than usual. Bearing in mind these invariable effects of opium, its value in disease must be sufficiently obvious, as allaying pain, inducing sleep, and checking inordinate secretions.

In febrile diseases opium is useful where there are no high inflammatory symptoms. In typhoid fevers it allays irritability and watchfulness, quiets many of the nervous symptoms, prevents inordinate relaxation of the bowels, and tends, in combination with alcoholic and ammoniacal stimulants and bitters, to support the general powers of the system. In intermittent fevers, and especially in those which long resist the curative power of cinchona, it has been found that putting the system under the influence of opium, at the accession of the fit, has much accelerated its cure by the ordinary methods.

In acute and in chronic rheumatism opium is a most important remedy, as relieving the excruciating and wearing pains of those disorders. Here it is generally given united with diaphoretics, especially in the acute form of the disease: in its chronic state, similar combinations my be resorted to, and especially opium and calomel, with small doses of ipecacuanha or of emetic tartar. The following formula is very effectual in allaying rheumatic pains, especially when they come on with increased severity, as is often the case, upon getting warm in bed, or during the first sleep:—

℞ Opii gr. iv.
Calomelanos gr. vj.
Antim. Tartar. gr. j.
Extract. Conii ℈j.
M. divide in pilulas viij. Sumantur duæ hora decubitûs.

Where rheumatic and spasmodic pains are conjoined, as is not unfrequently the case, and where the attacks are periodical, opium, calomel or blue pill, cinchona or other tonics, and an occasional warm aperient are the remedies that rarely fail of success. But in obstinate chronic rheumatism,

confined to some one joint or muscle, the treatment by a brisk emetic and local stimulants is most to be depended upon.

In all obstinate and irritating coughs, where inflammatory action is not predominant, an opiate at bedtime is always palliative, and often curative: sometimes inflammatory action, or tendency to it, is produced and kept up by the mere strain and exertion of coughing; and, in such cases, that which checks the cough will diminish the inflammation.

In eruptive diseases, attended by typhoid fever, and in those cases of small pox especially in which convulsions precede the eruption, in putrid sore throat, in scarlet fever, and in all diseases attended by nervous debility, opiates are beneficial; but they must be cautiously administered, more particularly in reference to the state of the bowels. There is, in short, no spasmodic or convulsive disease in which the use of opium may not be said to be indicated; but it commonly requires the aid of purgatives, and often occasions mischief if the action of the bowels be not had in due consideration.

In certain dyspeptic states of the stomach attended by cramp, in water-brash, in common colic, and, above all, in *colica pictonum*, opium is successfully used: in all visceral diseases, attended by pain, it is often resorted to as a palliative: in the irritation of sabulous particles and calculi in the kidneys, ureters, or bladder, it is often the only means of securing a little rest; but here it requires very cautious attention to the state of the bowels, and especially of the urine, for the latter is sometimes so much diminished in quantity by the influence of opium, as to precipitate a large additional proportion of sabulous matter. In cases of diseased prostate, irritable bladder, and painful affections of the rectum, a suppository of two or three grains of opium is sometimes the best mode of applying the remedy. Large doses of opium have also been found effectual in the treatment of diabetes*, and in that of uterine hæmorrhage †.

The use of opium in various combinations, and especially

* Money. Med. Chir. Trans. vol. v. p. 236.

† Stewart. Ibid. vol. iv. p. 358.

with mercurials, has already been adverted to. In reference to this subject Dr. Paris justly observes* that, "in combination, the medical powers of opium are wonderfully extended, so that there is scarcely a disease in which it may not, during some of its stages, be rendered useful;" and his formulæ furnish many good illustrations of such combinations.

Opium is best given in substance or in tincture; of the former a grain, and of the latter twenty minims, may be regarded as the average dose. Acetic and citric tinctures of opium have sometimes been recommended, under the idea that they prove sedative without exciting the nausea, headach, and constipation which are so apt to follow the use of this remedy; but neither these, nor any of the salts of morphia, some of which have been recommended upon similar grounds, are found to justify, upon trial, the encomiums which have been bestowed upon them.

Ether, camphor, ammonia, and aromatics, are among the most useful adjuncts to opium to prevent nausea and headach, and the bowels must be kept going by ordinary aperients, and occasionally more completely evacuated by a brisk purge. The tincture of opium is the most rapid and direct in its action of the preparations of this drug: opium in substance may be combined occasionally with gum resins, so as to render it less rapidly soluble in the stomach, and thus to retard or prolong its anodyne influence.

Persons habituated to opium will frequently bear very large doses with little effect; but where this is not the case, and where its direct sedative effects are imperiously required, as in cases of violent pain or spasm, or after certain surgical operations, care should be had not to administer it in small doses requiring repetition, since it is then apt to exhibit its stimulant rather than its anodyne powers: a full dose, of a grain and a half or two grains, or from thirty to forty drops of the tincture, should be given at once, and repeated in an interval of two hours, if requisite: the patient should also be kept perfectly quiet.

The exhilarating effect which opium produces upon some people, induces them to the dangerous expedient of habitual

* Pharmacologia, vol. ii. p. 322.

indulgence in its use; a custom which cannot too cautiously be guarded against, since it impairs the mental as well as the corporeal faculties, and, sooner or later, proves infinitely detrimental to both.

When an over-dose of opium has been taken, the treatment consists in exciting vomiting as speedily as possible, and in the subsequent administration of stimulants. The emetics to be preferred are sulphate of zinc or sulphate of copper. The latter is, perhaps, the most effective, and may be given in the dose of ten grains, dissolved in two ounces of warm water, and repeated after a quarter of an hour if necessary. Large draughts of acidulated fluids are then recommended; but I should rather prefer chamomile or wormwood tea, and these not in large quantities. When the stomach is thoroughly evacuated, the recurrence of drowsiness must be prevented by keeping the patient in motion; ammoniacal and spirituous stimulants must be administered; and strong coffee has been found effectual in diminishing the headach and stupor: bleeding, especially in the jugular vein, may be resorted to, to relieve the fulness of the vessels of the brain. If in these cases the emetics refuse to act, or the patient is in such a state as to be unable to swallow them; if the pupil is dilated, the breathing stertorous, and the system in a state of torpor from which it cannot be roused, the sufferer falls a sacrifice to the poison. In such cases, on examination after death, an inflammatory state of the stomach and bowels is the chief corporeal derangement that is discovered; in the brain no other morbid appearances are observed than extreme fulness and distension of the vessels generally: from Mr. Brodie's experiments, however, as well as those of Orfila, and other physiologists, the inflammatory appearance of the stomach would seem to result rather from the stimuli administered than from the direct influence of the poison.

As an external application, opium is not without its use, though it has probably been overrated. It may be applied in plasters, ointments, liniments, and embrocations, in all cases where pain and irritation are to be mitigated and subdued, or where cramp and spasm are to be relieved. A piece of cotton soaked in laudanum, or a piece of solid opium, put into the cavity of a hollow tooth, is a very effectual re-

medy in tooth-ach. The local application of opium is sometimes very successfully resorted to in painful tumours and ulcerating sores; but in such cases its internal administration is usually more effective.

Opium, if ever administered to children, requires to be given with more than ordinary caution: it should never be resorted to in any form except upon emergencies; and all opiates, especially syrup of poppies and some nostrums containing opium, which are but too frequently used to quiet children, should be most imperiously excluded from the list of nursery medicines.

OPOPONACIS GUMMI RESINA—*The Gum Resin of the Pastinaca Opoponax.*—The roots of this species of parsnip, which is a native of the Levant, furnish, on incision, a milky juice, which, when dried in the sun, is the *opoponax* of the shops. It generally occurs in tears, or in irregular agglutinated masses, of a peculiar smell, somewhat resembling that of galbanum, a yellowish colour, and a bitterish taste. In pharmacy it ranks with ammoniacum and galbanum, and was formerly employed in cases where those gum resins are generally prescribed. It has of late fallen almost entirely into disuse, and is indeed a remedy which might with propriety have been excluded from the Materia Medica.

ORIGANUM—*Origanum vulgare—Marjoram.*—This is a warm aromatic plant, formerly held in high estimation as a tonic and emmenagogue, but is now never prescribed. It furnishes an essential oil, which is sometimes employed as a stimulant, and also as a perfume in liniments and ointments.

OVUM—*The Egg of the Phasianus gallus, or domestic Fowl.*—Eggs are well known as nutritious food; and the yolk, beaten up with a little wine or brandy and sugar, is a good restorative in cases of debility. In pharmacy the yolk of egg is frequently used as a medium for mixing or suspending insoluble or imperfectly soluble substances in water: it consists chiefly of oily matter, and a peculiar modification of albumen; the former may be obtained by expression from hard-boiled

yolks which have been slightly torrefied: it had a place in old Pharmacopœiæ, under the name of *oleum ovorum:* it was particularly celebrated as a remedy for deafness, a few drops being put into the ear night and morning; and it may possibly have been useful as a very unctuous application in cases of deficient ceruminous secretion. Egg-shells were once celebrated as an antacid, but are not preferable to more convenient forms of carbonate of lime.

PAPAVERIS CAPSULÆ—*The ripe Seed Capsules of the Papaver somniferum, commonly called Poppy-heads.*—The white poppy is largely cultivated in the neighbourhood of London, for the purpose of supplying the pharmaceutical demands of the metropolis. These capsules furnish an extract, a syrup, and a decoction. The former is often conveniently used as a substitute for opium, in doses of six or eight grains, which are considered equivalent to one of opium. Though less certain than that drug in its sedative effects, it often produces rest without the excitement which some constitutions suffer from opium. The same may be said of the syrup, which, when carefully and properly prepared, according to the directions in the Pharmacopœia, is an active opiate, and by no means to be trifled with, as it sometimes unfortunately is, especially with children. A tea-spoonful has been known to prove fatal to a healthy infant. But this syrup is rarely prepared as it should be; and often a solution of extract of poppies in simple syrup, or a mixture of tincture of opium and syrup, are substituted for it; so that it becomes a very uncertain remedy. Of the genuine syrup from one to two drachms may be considered a dose for an adult. It is liable to ferment, and should therefore be kept cool, and not placed upon the chimney-piece, or in hot rooms of invalids.

The decoction of poppies is exclusively used as an anodyne fomentation, but it is little preferable to warm water: tincture of opium added to warm water is a very effectual substitute for it.

PETROLEUM.—This bituminous substance, known also under the names of *Barbadoes* and *mineral tar*, has been used internally as a sudorific and diaphoretic, and externally as a

stimulating application in cases of chronic rheumatism and affections of the joints. In this country it never enjoyed much reputation, and is now entirely laid aside. In Germany it has been extolled as an anthelmintic in cases of tænia. The following are Schwartz's drops for the cure of tape-worm :—

℞ Petrolei ℥ss.
Tinct. Assafœtid. ℥vj.
M. sit dosis gutt. 40 ter de die.

PIMENTÆ BACCÆ—*The Berries of the Myrtus Pimenta—Allspice—Jamaica Pepper.*—This tree is abundant in the West Indies, especially in Jamaica. The berries are gathered before they are quite ripe, and dried in the sun. The flavour of allspice is agreeably warm and aromatic, and in pharmacy it often serves the purpose of more expensive spices. It is especially useful in covering nauseous bitter flavours in various infusions, and the distilled water is a pleasant vehicle for saline purgatives and rhubarb.

PIPERIS LONGI FRUCTUS—*The unripe Fruit of the Piper longum—Long Pepper.*—This pepper differs little in flavour, and nothing in medicinal properties, from black pepper. It is native in Bengal, where the spikes are gathered in an immature state, and dried in the sun.

PIPERIS NIGRI BACCÆ—*The Berries of the Piper nigrum—Black Pepper.*—This plant grows wild in India, but its fruit does not attain perfection without care and culture. It is grown with many precautions and with much success in Java, Malacca and Sumatra, whence the European market is almost exclusively supplied. A full and curious account of the method of cultivation is given by Mr. Marsden, in his History of Sumatra.

Black pepper has little odour, but an intensely pungent taste, free from aroma. Its acrimony has been ascribed to a peculiar salifiable base, and to a distinct vegetable principle; but these views require further confirmation. Alcohol is the most perfect solvent of the active principle of pepper; water

also extracts it in considerable proportion. When purchased in the ground or powdered state it is very apt to be adulterated; and even the entire corns have been imitated by a farinaceous paste rolled into the figure of the berry. This fraud is detected by boiling water upon the pepper, which disentegrates the spurious grains.

The uses of black pepper as a condiment are well known. In pharmacy it ranks with the most powerful vegetable stimulants, and is sometimes usefully combined with bitters, in dyspeptic affections attendant upon gout. It has been extolled as a coadjutor to bark in the cure of intermittents; but its only merit in such cases is as a warm condiment, generally agreeable to the stomach. In those kinds of sore throat attended by relaxation, a gargle or infusion of black pepper may be substituted for that of cayenne pepper or capsicum.

PIX ABIETINA—*The prepared Resin of the Pinus abies—Burgundy Pitch.*—(See *Abietis Resina.*)

PIX LIQUIDA—*The liquid prepared Resin of the Pinus sylvestris, or Scotch Fir—Tar.*—This substance is prepared by a kind of distillation of the wood of the Scotch fir, which is cut into billets, and piled into a stack covered with turf; this is set fire to, and suffered to burn slowly, with the imperfect access of air: during this process the tar runs off at the bottom of the pile, and is collected in barrels. It is chiefly imported into England from the Baltic.

Boiling water poured upon tar acquires an empyreumatic flavour and a yellow colour. *Tar-water* thus prepared has occasionally been used as a diaphoretic and diuretic, but it is properly rejected from present practice. Sir Alexander Crichton recommends the vapour of heated tar, the acid of which has been previously neutralized, to be diffused through the atmosphere in the chambers of persons suffering under pulmonary consumption. Tar-water has also been celebrated as an external application in ring-worm and other cutaneous affections, but the eulogies which have been bestowed upon tar, in any form, appear very ill deserved.

PIX NIGRA—*Pitch—the solid prepared Resin of the*

Pinus sylvestris.—This is merely inspissated tar, and is of no kind of use as an article of the Materia Medica.

PLUMBI SUBCARBONAS—*Subcarbonate of Lead—Ceruse, or White Lead.*—This is a substance of little or no use in pharmacy. It is sometimes employed alone, or in ointments, as an application to unhealthy sores. It consists of one proportional of oxide of lead = 112, and one of carbonic acid = 22, and ought therefore to be termed *carbonate of lead* *. I have known it recommended as an application to the excoriated cuticle of infants, where it is a most dangerous and improper remedy: even with adults, who have used it as a cosmetic, it has induced alarming symptoms.

Painters and the manufacturers of white lead are subject, from the absorption of the poison, to the disease called *colica pictonum;* the leading symptoms of which are, constant pain about the region of the navel, and obstinate constipation, attended by frequent but ineffectual desire to evacuate the bowels. The violence of the pain, however, and of the other symptoms, is dependent upon the quantity of poison, and the circumstances under which it has been introduced into the system, so that there is an acute and chronic form of the disease. Loss of appetite, nausea, occasional vomiting, and excessive anxiety and restlessness, are symptoms which frequently harass the patient for several weeks; and, in some cases, a kind of delirium or mania succeeds, which, however, is not to be considered as alarming, since it goes off with the other symptoms. Neither the pulse nor the tongue are materially affected, except, perhaps, that the former is quickened during the paroxysms of pain, which appears to be, in some measure, relieved by pressure on the parts, and by keeping the trunk bent upon the knees, a position which we frequently observe in sufferers from this colic, and which leads to a distinction between it and inflammation of the bowels. The symptoms of this colic may be considered as arising from a spasmodic affection of the intestinal canal, and chiefly of the

* See Part II. *Preparations of Lead.*

colon; the fæces are thus confined, and become hard and irritating; the principal objects, therefore, in the treatment are, to allay spasm, so that aperients may become operative, and to evacuate the bowels by the least irritating means; opium, therefore, should be conjoined with gentle aperients.

℞ Olei Ricini f℥ss.
Vitelli Ovi q. s.
Aq. Anethi f℥iss.
Tinct. Opii gutt. xxx.
M. fiat haustus sextâ quâque horâ sumendus.

Opiate glysters, warm fomentations, and, above all, the hot bath, are useful remedies, and sometimes saline purges may be substituted where castor oil disagrees; or, where all fluids are rejected by vomiting, a pill of calomel aloes and opium must be had recourse to. When the bowels are fully relieved, and by proper after-treatment brought to their natural state, the various symptoms of the disease rapidly give way, provided it has been attacked at an early period, and all further ingress of the poison carefully avoided. But where it has long existed in a chronic form, or where the acute attacks have been often repeated, other symptoms appear, more difficult to combat: such are, attacks resembling epilepsy, and a paralytic affection of the hands, the wrist becoming, as it were, very loose and flaccid; soft and hard tumours are also discerned on the back of the hand, the former being the enlarged sheaths of the tendons of the extensor muscles, the latter, the swollen heads of the metacarpal bones: the adductor muscles of the thumb are also observed to waste away. Even where the disorder has arrived at this height, proper treatment, with especial attention to the bowels, and the application of splints, so as to keep the hand supported in a straight line with the fore-arm*, will generally succeed in curing the prevailing symptoms, but the entire recovery is excessively slow and doubtful, and some of the effects of the

* See Dr. Pemberton's observations on the use of splints in these cases, in his *Practical Treatise on the Diseases of the Abdominal Viscera*, p. 151.

malady usually haunt the patient during the rest of his life. It is, above all things, necessary to remove persons suffering under this complaint from all possible sources of the poison which has brought it on; to give them air, and such exercise as they can endure; and to enjoin a nutritious, but not a stimulating diet. Where these precautions are neglected, or where proper treatment is not resorted to, the persons become incredibly emaciated, the epileptic attacks frequent, palsy more general, and they die a lingering death. What I have now said will show the necessity of great precaution in all medicinal uses of the preparations of lead.

PLUMBI OXIDUM SEMIVITREUM—*Litharge, or semivitrified Oxide of Lead.*—This is protoxide of lead reduced by imperfect fusion to the form of transparent scales of a reddish yellow colour. It consists of—

1 proportional of Lead	.....	104
1 ——— Oxygen	.....	8
		112

In combination with, oil this oxide forms common plaster (*emplastrum plumbi*).

PORRI RADIX—*The Root of the Allium Porrum, or Leek.*—This is a stimulant possessing the general properties of garlic, but much milder. No good reason can be given for retaining it in the present list of Materia Medica.

POTASSÆ NITRAS — *Nitrate of Potassa — Purified Nitre — Saltpetre.* — England is exclusively supplied with nitre from her Indian territories. It is imported from Bengal in a very impure and imperfectly crystallised state, and refined in this country by solution and crystallisation. It is an article of enormous consumption in the time of war, being an essential ingredient in gunpowder; it is also largely employed as a source of nitric acid, and for some other purposes in the arts. It crystallises in six-sided prisms, terminated by a

dihedral summit, and retains no water of crystallisation, being composed of—

1 proportional of Nitric Acid	54.	.....	53.
1 ——— Potassa	48.	.....	47.
	102.		100.

The crystals are permanent, and soluble in seven parts of water at 60°, and in less than their own weight at 212°. Nitre fuses at a dull red heat, and concretes, on cooling, into a transparent white mass, often called *sal prunella*, a name derived from the circumstance of its having occasionally been stained of a plum colour. At a red heat its acid suffers decomposition.

Nitre has a peculiarly cooling taste; it is diuretic; and when given in small but repeated doses, it diminishes arterial action: hence it is frequently administered as a sedative refrigerant in inflammatory complaints, excepting those of the urinary organs, where it ought generally to be avoided. The dose of nitre is from five to twenty grains, in an ounce and a half of liquid: the best vehicles are those of a mucilaginous nature, and almond emulsion is frequently used. If intended to exert its refrigerant powers, the draught, as Dr. Paris has remarked, should be swallowed immediately after the solution of the salt is complete. In such cases it may be directed in powder, as follows:—

℞ Pulveris Nitri gr. viij.
Pulver. Tragacanth. compos. ℥ss.
M. fiat pulvis quartis horis ex aquæ frigidæ cochlear. iij. sumendus.

In inflammatory diseases nitre may also be combined with a variety of diaphoretic remedies, such as the common saline draught, or with saline mixtures containing tartarised antimony:—

℞ Potassæ Subcarbonatis ℈j.
Succi Limonum recentis f℥ss.
Misturæ Camphoræ f℥j.
Potassæ Nitratis gr. x.
Syrupi Rhæados f℥j.
M. fiat haustus quartâ quâque horâ sumendus.

℞ Liquoris Ammoniæ Acetatis,
Aquæ Menthæ viridis, āā f℥ij.
Aquæ distillatæ f℥iiiss.
Potassæ Nitratis ℥ss.
Vini Antimonii Tartarizati f℥ss.
Fiat mistura cujus sit dosis cochlearia tria ampla tertiâ vel quartâ quâque horâ.

Nitre is apt to create a very unpleasant coldness, attended often by spasm, in the stomach; and where this happens, its use should, in most cases, be discontinued.

Nitre is a good detergent addition to saccharine and viscid gargles for the cure of inflammatory sore throat:—

℞ Potassæ Nitratis ℥iss.
Mellis Despumat. f℥ij.
Aquæ Rosæ f℥vj.
M. fiat gargarisma.

Or,

℞ Potassæ Nitratis ℥ij.
Decocti Hordei f℥vij.
Oxymellis Simplicis f℥j. M.

The resemblance of crystallised nitre to Glauber's salt has sometimes led to the accidental substitution of the former for the latter; and in doses of half an ounce to an ounce, (the usual dose of sulphate of soda,) nitre proves virulently poisonous, exciting violent spasms, vomiting, bloody stools, convulsions, and often proving fatal. In such cases viscid mucilaginous drinks, with opium and cordials, are the most effective restoratives.

The solution of powdered nitre in water is attended by a considerable production of cold, which is increased by the addition of sal ammoniac; such a solution may sometimes prove effectual as an extemporaneous refrigerant lotion, where ice cannot be procured. For this purpose, equal weights of powdered nitre and sal ammoniac may be dissolved in ten or twelve parts of the coldest water that can be obtained.

POTASSÆ SULPHAS—*Sulphate of Potassa.*—For the preparation of this salt there is also a formula among the "Preparations and Compounds." Its usual form is that of a

short hexaedral prism terminated by hexaedral pyramids. The crystals are permanent in the air, of a bitter saline taste, and require sixteen parts of cold and five of boiling water for their solution. They consist of—

1 proportional of Potassa	48.	54.5
1 ——————— Sulphuric Acid ...	40.	45.5
	88.	100.

Sulphate of potassa is a useful aperient, and, in conjunction with rhubarb, forms an excellent purge for children. Fifteen grains of the powdered salt, with five of rhubarb, may be given to children of from four to six years of age, as an effectual, though gentle, means of removing visceral obstructions. In the dose of a drachm, or a drachm and a half, sulphate of potassa proves purgative, but its difficult solubility is against its general use. Sometimes it is administered in pills, with small doses of aloes, especially in cases of habitual constipation.

POTASSÆ SUPERTARTRAS—*Purified Supertartrate of Potassa.*—Tartar, in its crude state, as originally deposited in wine casks, is of a brownish red colour, and is purified by dissolving it in boiling water, and adding albumen and wood ashes; the former coagulates, floats, and entangles various impurities, whilst the latter occasions an effervescence, throwing these up to the surface, whence they are removed by repeated skimmings. Sometimes aluminous earth is used to precipitate the colouring matter, and sometimes the colour is destroyed by well-burnt charcoal.

Supertartrate, or bitartrate of potassa, consists of two proportionals of tartaric acid, and one of potassa, or—

Tartaric Acid	67 × 2 =	134.	73.6
Potassa		48.	26.4
		182.	100.

It is doubtful whether it contains any definite water of crystallisation. It is said to require 125 parts of water at 60°,

and 30 parts at 212°, for its solution; it is, therefore, on account of its difficult solubility, not well calculated for administration in liquids, but is generally exhibited in powder or electuary. It feels gritty in the mouth, and has a slightly acid taste.

In the dose of a drachm, repeated twice or thrice a day, cream of tartar proves aperient, but is very apt to excite pain and flatulence of the bowels. Conjoined with jalap it forms a diuretic purgative, already noticed as useful in dropsical affections. A weak solution of tartar, flavoured with sugar, and lemon-peel, is the pleasant refrigerant drink generally called *imperial:* the following are the proportions:—

℞ Potassæ Supertart. ℥ss.
Sacchari Purif. ℥iv.
Corticis Limonum recent. ℥ss.
Aquæ ferventis Oiij. M.

An electuary of tartar and honey is said to be efficacious as a vermifuge.

Purified tartar is sometimes mixed with white siliceous pebbles bruised into small fragments; this is the only adulteration I have detected in it, and, in one instance, to the amount of nearly 15 *per cent.* A variable proportion of tartrate of lime is also found in tartar. When the excess of acid in tartar is neutralized by an additional proportion of potassa, it constitutes the *potassæ tartras* of the Pharmacopœia, or the *soluble tartar* of old pharmacy, which is a good saline aperient. (See *Potassæ Tartras*, among the preparations and compounds.)

POTASSA IMPURA—*Impure Potassa—Pearlash.*—The British market is supplied with this article from the Baltic and from America. It is obtained by lixiviating wood ashes; the first product of the evaporation of the lie, which is brown, and commonly called *potash*, is converted into *pearl-ash* by gentle calcination in a reverberatory furnace, by which the carbonaceous colouring matter is burned out.

Pearlash is a mixture of several salts, among which carbonate of potassa predominates; it is usually tinged reddish or greenish blue by the oxides of iron and manganese: sulphate

and muriate of potassa are also plentiful in it, and it is often abundantly adulterated with sand and common salt.

The best mode of ascertaining the value of pearlash, or the quantity of real carbonate of potassa which it contains, consists in determining its saturating power in regard to any acid of known strength. "The best that can be employed for this purpose is sulphuric acid of specific gravity 1.141. Of this 355 grains are equivalent to the saturation of 100 grains of carbonate of potassa. Dissolving, therefore, that quantity of the carbonate in water, and gradually adding the test, so as to produce neutralization, we learn, by the quantity of acid expended, the quantity of real carbonate which has been acted upon: for as 355 is to 100, so is the weight of the test which has been used to the number required*." In thus testing the alkaline solution, it should be warmed so as to expel the carbonic acid which remains dissolved in it.

For pharmaceutical use, pearlash is purified by pouring upon it its weight of cold water, by which the carbonate of potassa (*subcarbonate* of the Pharmacopœia) is dissolved, and the less soluble substances remain. This solution is evaporated to dryness in a clean iron vessel.

PRUNA—*The dried fruit of the Prunus domestica—Prunes.*—The pulp of prunes is a mild aperient, and one of the ingredients in *confectio sennæ*.

PTEROCARPI LIGNUM—*The Wood of the Pterocarpus Santalinus—Red Saunders.*—No medical virtues belong to this wood, but it abounds in red colouring matter, very soluble in spirituous menstrua, and is used for tinging certain tinctures. It is imported in blocks from India.

PULEGIUM—*Mentha Pulegium—Penny-Royal.*—This species of mint affords, on distillation with water, a pungent aromatic oil, which, as a nervous stimulant, is occasionally added to antispasmodics and emmenagogues; or penny-royal water is used as a vehicle for such remedies. It is, however,

* Henry, vol. i. p. 523.

now much less used than formerly, though it may not improperly be substituted for mint or peppermint-water. 1 cwt. of fresh penny-royal affords an average produce of 1 lb of essential oil.

PYRETHRI RADIX—*The Root of the Anthemis Pyrethrum—Pellitory of Spain—Spanish Chamomile.*—This root is imported from the Levant. It is a powerful stimulant, exciting, when chewed, a tingling sensation upon the tongue, and a copious flow of saliva. It has, therefore, been used in substance, or as a gargle, in all cases where it is desirable to promote that secretion: it is often very effectual in relieving toothach, for which purpose the root may be chewed, or the following *compound tincture of pyrethrum* may be applied upon cotton to the tooth and gum:—

℞ Pyrethri Radicis contus. ℥ss.
Camphoræ ʒiij.
Opii ʒj.
Olei Caryophillor. ʒij.
Spirit. Vini rectificat. ℥vj.
M. et digere per dies decem. Cola.

In paralysis of the muscles of deglutition, pyrethrum has been administered in powder, and conjoined with other stimulants, in doses of from ten grains up to a drachm.

QUASSIÆ LIGNUM—*The wood of the Quassia excelsa.*—This wood is imported in billets from the West Indies. It has a pure but intense bitter taste, which it readily imparts to water. The best form for its administration is that of infusion, a good strength of which is two drachms of the rasped wood to a pint of boiling water, infused for four hours and strained. This has the advantage over most other vegetable infusions of not decomposing metallic salts; nor is it blackened by iron; hence it is a good vehicle for a variety of mineral tonics. In some cases of dyspeptic debility, especially that brought on by habitually taking too much wine, the stomach will sometimes be relieved by the following formula:—

℞ Infusi Quassiæ f℥iss.
Zinci Sulphatis gr. ¼
M. fiat haustus bis die sumendus.

An infusion of quassia, sweetened by brown sugar, is an effectual poison for flies, and should be preferred to the more pernicious compounds generally used for that purpose.

QUERCUS CORTEX — *The Bark of the Quercus pedunculata*—(according to the Pharmacopœia).

Oak bark has frequently been substituted for cinchona in the treatment of febrile diseases, but has never been found more effectual than other common astringent tonics, and perfectly inadequate to the cure of obstinate intermittents: this inefficacy may now plausibly be explained by the non-existence of any principle in oak bark corresponding to the salifiable bases discovered in the cinchonæ.

Infusion or decoction of oak bark is most used as an external application, combined with other vegetable astringents, or holding alum in solution, which, however, is partially decomposed by it.

RESINA FLAVA—*Yellow Resin.*—This is the produce of the *pinus sylvestris*, being the residuary resin, after the distillation of oil of turpentine. It acquires its yellow colour by being agitated with water while in a fluid state; when simply distilled to dryness, it becomes deeper coloured and transparent, and is then known as *rosin* or *colophony*. Yellow resin is an ingredient in various plasters, but is not used internally.

RHAMNI BACCÆ—*The Berries of the Rhamnus catharticus — Buckthorn Berries.* The juice of these berries is a mischievously drastic purgative, and should never be used, except in veterinary practice, though they once had considerable repute as promoters of watery discharge from the bowels, in cases of dropsy.

RHEI RADIX—*The Root of the Rheum palmatum*—

Rhubarb.—This plant is a native of China and Tartary; it has been cultivated in this country, and sometimes with a view of supplying the British market, but these attempts have pretty generally failed; indeed the exact species of *rheum*, with the root of which we are supplied by the Chinese, seems not accurately ascertained. The varieties of rhubarb, known in commerce under the names of *Russian*, *Turkey*, and *Indian* rhubarb, are all derived from one source; the finest and most perfect pieces being sold under the name of Russian and Turkey rhubarb, and the inferior ones as East Indian. In selecting rhubarb for the Russian market, the utmost attention is paid to its soundness, and a variety of curious precautions are adopted by that government to prevent the importation of any inferior kinds.

The best rhubarb is in pieces of various sizes, each of which, generally, has a hole bored through it. When cut or broken, it exhibits a mottled texture, and alternate streaks of red and grey. Its odour is peculiar, its taste nauseous, bitter, and astringent.

Water digested upon rhubarb dissolves, upon an average, about 50 *per cent.;* the infusion is yellow-brown, and contains mucilaginous, extractive, and astringent matter. Alcoholic tincture of rhubarb has a deep yellow colour, and a remarkably penetrating and nauseous taste and odour. It is generally stated, that rhubarb contains oxalate of lime, but I have never succeeded in obtaining oxalic acid from it, though I have procured an uncrystallisable acid, having the characters of the malic acid*. The following substances were obtained from 100 parts of the finest Turkey rhubarb:—

Water	8.2
Gum	31.0
Resin	10.0
Extract Tan and Gallic Acid	26.0
Phosphate of Lime	2.0
Malate of Lime	6.5
Woody Fibre	16.3
	100

* Quarterly Journal, vol. x. p. 288.

A comparative table of the effects of precipitants on the aqueous infusions of Russian and Chinese, or East Indian rhubarb, will be found in Mr. Thomson's Dispensatory (p. 474).

In selecting rhubarb, whether Russian or Chinese, the pieces should be broken, and those which are of a rusty colour, or which exhibit other appearances of decay, should be rejected. The colour of good rhubarb is bright, its texture dense, its powder bright yellow, inclining to buff.

Rhubarb is a very important article of the Materia Medica, and calculated to fulfil several indications. In doses of from fifteen to thirty grains it is aperient, emptying the bowels without griping, and acting afterwards as an astringent; hence its peculiar use in common diarrhœa. It is best given in some aromatic water, or conjoined with a few grains of powdered cinnamon, which covers its nauseous flavour. Combined with other purgatives, it presents us with a very useful series of pharmaceutical compounds. It may be given with the saline purges; and among them, sulphate of potassa deserves particular commendation, especially as a purge for children, to whom from five to ten grains of rhubarb, with ten or fifteen of the sulphate, may be administered as a safe and gentle evacuant. Rhubarb is also an excellent adjunct to calomel.

In small doses (from three to six grains) rhubarb acts as a tonic and astringent, and is given as such in a variety of dyspeptic affections. It is very conveniently formed into pills, with a little water only, in consequence of the gum which is one of its components; but these pills should not be kept too long, as they may become inert by induration. In these cases it may be combined with bitter extracts, or aromatic oils or spices; and it is often advisable to conjoin it with carbonate of soda, magnesia, or other antacids.

Rhubarb speedily passes off by the kidneys, and may frequently, by the aid of an alkali, be detected in the urine, within ten minutes after it has been received into the stomach; in the course of an hour or two it disappears, and after a few hours re-appears, a second absorption taking place, according to Sir Everard Home, from the colon.

In a paper published in the first volume of the Transactions of a Society for the Improvement of Medical and Chirurgical

Knowledge, powdered rhubarb is recommended by Sir E. Home as an application to ulcers, especially to those in parts which are too weak to carry on the actions necessary for their recovery *.

RHŒADOS PETALA—*The Petals of the Papaver Rhœas, or red Poppy.*—These are only used as a colouring material in syrup.

RICINI OLEUM ET SEMINA—*The Seeds of the Ricinus communis, and their expressed Oil.*—This plant is a native of the West Indian Islands and South America, and of several parts of Africa and Asia. The cortical part of the seed is extremely acrid and drastic; but when this is removed, they afford, on expression, a large proportion of a very pale, viscid fixed oil, of a nauseous smell and taste, and leaving a very slight sensation of acrimony on the palate. In the West Indies, the oil is sometimes separated by boiling the decorticated seeds in water: in this case it is deeper-coloured, more acrid, and more liable to become rancid; generally, also, more active as a purgative. This oil, commonly called *castor oil*, is a valuable aperient; for whilst, in doses of from half an ounce to an ounce, it thoroughly evacuates the bowels, it does so with little irritation, and hence is especially useful in inflammatory cases, or where there is spasm, or where all increased action of the system is particularly to be avoided. It is, however, extremely liable to nauseate to a most distressing extent, and often is rejected from the stomach; effects which may in some measure be prevented by giving it in aromatic waters. This circumstance should, however, render us cautious in giving castor oil in all cases of obstructed bowels, where vomiting may prove injurious; for instance, in hernia, or where there is determination of blood to the head. The best way of taking it is simply upon water, but it may sometimes be conveniently administered in the form of emulsion, triturated with mucilage or with yolk of egg, though in

* See also Practical Obs. on the Treatment of Ulcers, &c., by the same Author, 1801.

this way it is more nauseous to the palate, unless blended with aromatic waters.

℞ Olei Ricini f3vj.
Vitelli Ovi q. s.
Aquæ Menthæ Piper. f3x.
M. fiat haustus aperiens.

The oil should be first triturated with the yolk of egg, and the peppermint water gradually added, so as to form an even mixture. About half of the yolk of an egg will generally suffice.

Castor oil should be perfectly soluble in its bulk of alcohol of the specific gravity .820 ; if it form a milky mixture, or if any portion remain undissolved, we may suspect it to be adulterated with some of the more common fixed oils.

When boiled with a little dilute nitric acid, castor oil is converted into a substance resembling hard butter ; and I have known it undergo an analogous change in the bowels, and pass off in round and indurated nodules, which were at first supposed to be gall-stones.

ROSÆ CANINÆ PULPA.—*The Pulp of the Berries of the Dog Rose, or Rosa canina.*—The berries only should have had a place in the Materia Medica, and directions for separating the pulp should have been given among the "preparata et composita," under the head of *confectio rosæ caninæ*, or conserve of hips. These berries are uselessly inert, but the conserve is sometimes a good vehicle for expectorants and demulcents, in the form of linctus.

ROSÆ CENTIFOLIÆ PETALA—*The Petals of the Rosa Centifolia, or Damask Rose.*—These are exclusively used in the distillation of rose water, when they afford a butyraceous oil, which is largely prepared in warm climates, and imported, especially from the East, under the name of *otto of roses*. The English oil is of a very inferior odour, and apt to become rancid ; the foreign oil is often adulterated with oil of sandal wood, and the crystalline appearance of the genuine otto imitated by the addition of spermaceti.

ROSÆ GALLICÆ PETALA—*The Petals of the Rosa Gallica, or Red Rose.*—The unfolded buds are used in the preparation of the *confectio rosæ gallicæ*, which is a convenient vehicle for some medicines. Mild astringency is the only medical virtue of these petals. They afford, with the aid of a little acid, an elegant red infusion. Alkalies render them green.

ROSMARINI CACUMINA—*The Tops of the Rosmarinus officinalis, or common Rosemary.*—Distilled with water or alcohol, these impart an agreeable fragrancy, from the essential oil which they contain. A very weak infusion of fresh rosemary leaves furnishes a pleasant substitute for tea, and is particularly agreeable to some dyspeptic stomachs and nervous habits.

A pound of fresh rosemary is said to afford about a drachm of essential oil.

RUBIÆ RADIX—*The Root of the Rubia tinctorum—Madder.*—This root is highly valuable as a dye-stuff, but is not entitled to much notice as an article of the Materia Medica, where it ranks with the astringent bitters. It tinges the urine of a red colour, and the bones of animals long fed upon it acquire the same hue, for which reason only it has been very absurdly recommended as a remedy in rickets. Sydenham thought highly of a decoction of madder as a remedy in jaundice, but probably upon wrong grounds: it is sometimes extolled as an emmenagogue, but as such is perfectly inert.

RUTÆ FOLIA—*The leaves of the Ruta graveolens, or Rue.*—The nauseous, but at the same time strong and penetrating odour of rue, places it among the antihysterics; and it is described as antispasmodic and emmenagogue. In all these respects it is of very uncertain and unimportant efficacy. —(See *Confectio Rutæ.*) According to Cartheuser, 320 pounds of rue afford one pound of essential oil.

SABINÆ FOLIA—*The Leaves of the Juniperus Sabina, or Savine.*—This plant is a native of the South of Europe, but frequently cultivated as an ornamental shrub in our gardens. Its odour is strong and peculiar, its taste acrid and bitter; its active qualities appear chiefly to reside in an essential oil, of which it affords a considerable relative quantity on distillation. It is, perhaps, the most powerful uterine stimulant of the Materia Medica, and is occasionally administered in amenorrhœa, though always requiring the utmost caution, lest it induce inflammatory action. There are some other disorders in which savine has been employed; but its most important use is as an external stimulant, especially with the view of keeping up the discharge from excoriated or vesicated surfaces. The dried leaves in powder are sometimes sprinkled upon indolent and unhealthy sores; but the *ceratum sabinæ* of the Pharmacopœia is the most generally useful form for the application of this remedy.

SACCHARUM—*Sugar.*—This is an agreeable and nutritious article of diet; in some of its forms gently laxative; but it scarcely belongs to the list of medicines. In pharmacy its chief use is to confer palatability on unpleasant mixtures, and as a vehicle for active remedies. The components of sugar differ little in their relative proportions from those of gum and starch; indeed the latter substance is convertible both into sugar and gum. According to Gay Lussac, 100 parts of sugar contain—

Carbon	42.47
Hydrogen	6.90
Oxygen	50.63
	100

SAGAPENUM—*The Gum Resin of a nondescript plant.*—This is probably the produce of a species of *ferula*. It is imported from Smyrna and Aleppo. It is generally in masses made up of agglutinated pieces, of a pale and dark brown colour. Its taste is warm and alliaceous, resembling weak assafœtida. Its use corresponds with that of the other fetid gums.

SALICIS CORTEX—*The Bark of the Salix caprea.*—Several species of willow bark have at different times been introduced into the Materia Medica, and they are useful tonics and astringents; but we must not too hastily assume that they may be substituted for cinchona. A strong decoction is the best form of exhibition; and it may be rendered palatable by any aromatic tincture, or by the addition of a few bruised cloves, added just before the decoction is strained.

℞ Cort. Salicis contus. ℥iij.
Aquæ oct. ij. decoque ad octarium j. et cola.

℞ Colati liquoris f℥vij.
Tincturæ Aurantii f℥vj.
Syrupi Aurantii f℥ij.
M. sumat quartam partem ter die.

SAMBUCI FLORES—*The Flowers of the Sambucus niger—Elder Flowers.*—Water distilled from elder flowers acquires their peculiar and rather agreeable odour, and is frequently used as a vehicle for various ophthalmic applications. The *unguentum sambuci* is lard similarly scented; but no efficacy is in either case derived from the elder flowers.

SAPO DURUS.—The *hard soaps* used for pharmaceutical purposes are compounded of soda and vegetable oil, generally olive oil. It is used internally as a remedy for uric gravel, and, when taken in large doses, has been known to prove singularly effectual; but it is not generally commendable in such cases, and is extremely apt to impair the digestive powers of the stomach, and lay the foundation of obstinate dyspepsia. Soap is an excellent addition to pills which are intended to be kept for any time: it prevents, to a considerable extent, their induration, and renders them more soluble in the stomach; it also modifies the efficacy of several of the purgatives, probably by increasing the solubility of their active parts. Soap is a good addition to spirituous liniments; it renders them less rapidly vaporisable, and better adapted for friction upon the part affected.

Soap is decomposed by acids, by the greater number of salts, and by several vegetable decoctions and infusions; and, as being almost always at hand, is useful occasionally as an antidote to some poisons, such as metallic salts, acids, &c.: in these cases a tea-cupful of a strong solution of soap in warm water should be swallowed as soon as possible; if it produce vomiting, the dose should be repeated, and it will prove more effectual. Added to plasters, soap prevents their induration.

Soap, scraped into thin shavings and dried by a gentle heat, may easily be reduced to a fine powder by pounding and sifting: it is frequently used in this state as an ingredient in cleansing hand powders; such, for instance is the *pulvis saponis mundificans* of Nieman's *Pharmocopœia Batava*, composed of twelve ounces of finely powdered Spanish soap, two ounces of efflorescent carbonate of soda, three ounces of powdered orris root, two pounds of fine almond meal, and of the essential oils of lemons, lavender, and bergamotte, each forty drops, with ten drops of oil of cloves.

SAPO MOLLIS—*Soft Soap.*—This is made with potassa instead of soda. The common soft soap of the shops, which is made with potash-ley and tallow, is an excellent detergent for the destruction of vermin.

SARSAPARILLÆ RADIX—*The Root of the Smilax Sarsaparilla.*— Several kinds of sarsaparilla root are occasionally imported from South America. That which is preferred is in long slender runners, issuing from a common stem: it is bound up in bundles of various sizes, which very frequently contain extraneous substances in their interior, or faggots of rotten and decayed roots. This variety is distinguished as *Lisbon sarsaparilla;* it is the produce of the Brazilian settlements of Pura and Ataranham, in South America *. When sarsaparilla is cut longitudinally, it is found to consist of a soft, white, and often starch-like substance, covered by

* Pope on Sarsaparilla, Med. Chir. Trans. vol. xii. p. 345.

a brown bark, and surrounding a central woody fibre. The white matter of the root has generally been considered as the active part: its taste is mucilaginous, and very slightly acrid; when long boiled in water it is for the most part dissolved. The bitterness and, according to Mr. Pope, the efficacy of sarsaparilla resides in the bark, the whole of the virtues of which are extracted by infusion or decoction in water. He considers what is called *Jamaica* or *red* sarsaparilla as preferable to the other varieties, in consequence of the large quantity of extractive matter which it affords. The *Honduras* sarsaparilla is not so red as the Lisbon, its bark being dirty brown or grey, and it is usually more fibrous and pithy: that from Vera Cruz is very inferior.

The virtues of sarsaparilla have been very differently estimated by different persons, and at different times: the evidence of the best practitioners is, however, decidedly in its favour, as a valuable alterative remedy; for, in large doses, and sufficiently persevered in, it has cured cutaneous eruptions, and those anomalous pains in the bones and joints, the sore throat, and other symptoms, which arise in certain constitutions, being apparently the joint effect of mercury and of the venereal virus. In such cases we have Mr. Pearson's testimony in its favour, though he decidedly shews that, as an antidote to syphilis, it deserves no kind of confidence: he also observes, that its beneficial effects are often demonstrated in the treatment of foul, untractable spreading sores, and in more than one form of scrofula*. In some of those debilitated states of the body, announcing a broken constitution, sarsaparilla has been effectually prescribed. It requires to be taken in large doses, such, for instance, as a pint of the decoction daily, or an ounce of the powder. Concentrated syrup and liquid extract of sarsaparilla are also good formulæ; but the common extract of the Pharmacopœia does not seem to possess the efficacy which might be expected.

In debilitated habits sarsaparilla occasionally excites very profuse perspiration, an effect which may, to a certain extent,

* Obs. on the Effects of various Articles of the Materia Medica in the Cure of Lues Venerea, &c.

be prevented by combining with it small doses of dilute sulphuric acid, where such a remedy is not contra-indicated.

SASSAFRAS LIGNUM ET RADIX—*The Wood and Root of the Laurus Sassafras.*—This species of laurel is a native of America, and was at one time regarded as powerfully anti-syphilitic; modern experience has, however, amply shown the fallacy of such an opinion, and it is now chiefly used as a diaphoretic or diuretic in the form of decoction. It has a fragrant smell and a warm aromatic flavour, derived from essential oil, which is obtained by distillation with water in the proportion of about two drachms from every pound of wood.

Gout, chronic rheumatism, and cutaneous affections, are the cases in which decoction or infusion of sassafras is usually prescribed, and generally in conjunction with guaiacum, sarsaparilla, and other analogous alteratives: here, however, it is a remedy of most doubtful efficacy.

SCAMMONIÆ GUMMI RESINA—*The Gum Resin of the Convolvulus Scammonia.*—This is a common plant in Syria; its root furnishes, by incision, a milky juice, which concretes into the scammony of commerce, a substance chiefly imported from Aleppo. It occurs in very various states of purity; and an extremely inferior and evidently adulterated article is brought from Smyrna in cakes. Aleppo scammony comes into the market in packages called *drums*, weighing about 100 pounds each: it is massive, of a black or dark grey colour externally, and, when broken, exhibiting in some parts of its interior a grey or greenish brown tint and a softer texture. It has a caseous odour, which should be strong and fresh, and it should lactify or easily rub into a milky mixture with water. Those drums which are very soft in the interior, of a pale or dirty green colour, and of a fetid or nauseous odour, or those which are black and inodorous, and which do not become superficially milky when wetted and rubbed, are of doubtful purity. It is said that a factitious article, composed of jalap, senna, manna, gamboge, and ivory black, is sometimes sold for scammony. The colour of good scammony in powder is light greenish grey.

Scammony is a very useful drastic purge in conjunction with others of the same class, being rarely, if ever, given alone, for then it is apt to gripe. It enters into several of the compound purgatives of the Pharmacopœia, and is a good auxiliary to calomel, especially for cleansing the bowels of children when loaded, as they sometimes are, with viscid mucous slime: for this purpose, the old *pulvis basilicus*, composed of equal parts of calomel, scammony, and jalap, is an effective mixture; but it will not always remain upon the stomach. Proof spirit is a good solvent for scammony, but it is rarely used in tinctures: its average dose is from five to fifteen grains, and it is said that its activity resides in its resinous part, and that the gum is inert. In some old Pharmacopœiæ, a variety of methods of correcting the acrimony of scammony are described, and to such preparations they gave the name of *diagrydia*.

SCILLÆ RADIX—*The Root of the Scilla maritima—Squill Root.*—This bulbous root is imported from the Levant packed in wet sand: it has a nauseously bitter and very acrid flavour, and is generally cut into slices and dried for pharmaceutical use; an operation which ought not to be performed at a temperature exceeding 212°. The peculiarities of squill have been referred to a distinct bitter principle, called by Vogel *scillitin*.*

In large doses, squill is purgative and emetic; but it is only employed in smaller doses as a powerful expectorant, and as a diuretic in conjunction with other remedies. From half a grain to a grain of powdered squill, with three grains of ammoniacum, may be given every six hours to increase and facilitate expectoration; in some cases it may properly be conjoined with the fetid gum resins; in others, where there is heat and febrile tendency, it may be given with antimonials and saline remedies; and as a diuretic, with calomel, digitalis, opium, and other adjuncts, as already mentioned. About thirty drops of the tincture of squills of the Pharmacopœia may be regarded as equivalent to one grain of the

* Annales de Chimie, tom. lxxxiii.

dried root, and this is the most convenient form for its administration when conjoined with liquids.

In cases attended by any degree of active inflammation, squills should scarcely be administered, unless accompanied by aperients and diaphoretics, and generally also by venesection.

Excessive vomiting and purging, strangury and bloody urine and stools, acute pain of the abdomen, convulsions, and cold sweats, are the symptoms which are said to be produced by an overdose of squills.

An ointment of squills has occasionally been recommended for the dispersion of indolent tumours; but it is a clumsy stimulant, admitting of an infinity of good substitutes.

SENEGÆ RADIX—*The Root of the Polygala Senega—Rattle-snake Root.*—This plant is a North American perennial. The root is pale brown and wrinkled, and its virtues reside in the exterior cortical portion; the central woody part is inert. Its acrimony manifests itself when chewed, and it promotes a copious flow of saliva. Its infusion reddens litmus, a property depending, according to Peschier, upon the presence of a peculiar acid.

Senega has been extolled as a powerfully stimulant diuretic and expectorant, in doses of ten to thirty or forty grains in powder; and in larger doses it is said to vomit and purge: it is, however, one of those numerous articles of the Materia Medica, the use of which is limited to a few individuals who think well of it, whilst it is never prescribed by the generality of practitioners. In palsy and lethargy, it is inferior to many other stimulants; and as a sialagogue gargle, pyrethrum is more effectual. To promote the separation of the tracheal films of coagulum in croup, a strong decoction of senega, in the proportion of two ounces of the bruised root to a pint of water, is said to have been usefully employed, frequently taken in small quantities into the mouth. As an antidote to the effects of the bite of the rattle-snake, it may possibly be useful where other stimulants are not to be had, especially in its recent state; but where ammonia, ether, brandy, and other analogous remedies, are at hand, senega goes for nothing.

A decoction of senega retains its acrimony; but alcohol is the most effectual solvent of its resinous principle, in which its virtues appear to reside.

SENNÆ FOLIA — *The leaves of the Cassia Senna.*— The European market is supplied with senna leaves from Alexandria, whither they are brought from Upper Egypt; and after having been mixed and adulterated with leaves of the *cynanchum oleafolium*, or *argel*, and occasionally also with the leaves of bladder senna, box, and some others, they are packed in bales for exportation.

It is difficult to describe the characters which should guide us in the selection and purchase of senna; among them we may enumerate a bright, fresh colour, and an agreeable smell somewhat resembling that of green tea. It should not be too largely mixed with stalks, seed pods, and other extraneous matter, nor very much broken, nor very dusty.

Senna has, when chewed, a nauseous flavour quite peculiar to itself; with boiling water, (which, according to Mr. Thomson, dissolves about a third of the weight of the leaves employed,) it affords a brown infusion, very nauseous both in smell and taste, and liable to decomposition. Proof spirit dissolves a larger portion of senna, and forms a brown active tincture. Alcohol and ether yield green solutions.

Senna has been chemically examined by Bouillon la Grange*. The effects of various re-agents on infusion of senna have been described by Mr. Battley†. According to Lassaigne and Feneulle, the activity of senna, as a purge, depends upon the presence of a peculiar vegetable principle, which they have termed *cathartine*, and which may be procured as follows:— To an aqueous decoction of senna leaves add subacetate of lead as long as it occasions a precipitate, which is to be washed, diffused through water, and subjected to a current of sulphuretted hydrogen gas. Separate by filtration, and reject the precipitated hydrosulphuret of lead. Evaporate the clear liquor to dryness, digest the residue in alcohol, and again evaporate to dryness. This alcoholic residue contains

* See Annales de Chimie, vol. xxxvi. p. 3.

† London Medical Repository, vol. xv. p. 169.

acetate of potassa, which may be decomposed by the addition of sulphuric acid, and the sulphate of potassa separated by filtration. Then add acetate of lead to precipitate the sulphuric acid, and pass sulphuretted hydrogen through the liquid; filter, evaporate, and cathartine remains. It is deliquescent, and uncrystallisable, of a reddish colour, a bitter taste, insoluble in ether, but soluble in water and alcohol*.

The above process is so circuitous, and the vegetable principle subjected to such a variety of agents, that no dependence can be placed upon the supposed existence of its product as a distinct pre-existing principle of senna.

Senna is rarely to be depended upon alone, for it generally occasions griping, spasmodic, and flatulent pains of the bowels, without duly evacuating them; but it is a truly valuable auxiliary to other purgatives, and in many such mixtures clears the bowels with speed and certainty. The infusion is the best form for its exhibition; and ginger, as in the *infusum sennæ compositum*, is a good addition. It should be recently prepared, for if kept exposed to air it undergoes a change, and is said to be more apt to gripe. To these formulæ the tincture of senna may be added, and the following is one of the many modes of prescribing them:—

℞ Infus. Sennæ f℥iv.
Magnes. Sulphatis ℥j.
Aquæ Menthæ sativ. f℥ij.
Tinctur. Sennæ f℥ss.
M. sumat cochlear. iv. mane primo et repet. post horas tres, si opus sit.

The addition of syrups to such mixtures only renders them more nauseous, without assisting their efficacy: half an ounce of manna is, however, occasionally added to the above. Soluble tartar and infusion of senna form a good active purge, and pimento water covers much of the disagreeable flavour.

℞ Potassæ Tartratis ʒj.
Infus. Sennæ compos.
Aquæ Pimento ää f℥vj.
Tinct. Jalapæ f℥j.
M. ft. haust. laxans.

* Annales de Chimie et Physique, tom. xvi. p. 16.

SERPENTARIÆ RADIX—*The root of the Aristolochia Serpentaria—Virginian Snake-root.*—This root is imported from North America, where the plant is indigenous. It is small, fibrous, and generally very dirty. The freshest samples are to be preferred. Its odour is aromatic; its taste pungent, and somewhat bitter. Distilled with water, it affords a small quantity of fragrant essential oil, and the resulting decoction is warm and bitter. A strong infusion is the best form for its administration, in the proportion of one ounce of the bruised root, macerated for four hours in a pint of boiling water, and strained.

℞ Infus. Serpentariæ f℥iss.
Pulv. Serpentariæ gr. x.
Syrup. Aurant. f℥ss.
M. ft. haustus ter die sumendus.

In this way it proves a slightly diaphoretic tonic. In typhoid fevers it is a good adjunct to cinchona, for the powder of which its infusion may be used as a vehicle. Serpentaria is, however, little thought of in this country; the German physicians prize it more highly, and use it as a common tonic in cases of convalescence where such remedies are indicated, and especially where nervous debility has been predominant.

SEVUM—*Mutton Suet.*—The only pharmaceutical use of suet is as an ingredient in certain plasters and ointments.

SIMAROUBÆ CORTEX—*The Bark of the Quassia Simarouba, a native of the West Indies.*—This bark is imported in long and very fibrous flat pieces, stripped off the root. It furnishes an astringent and bitter infusion, and is occasionally prescribed in this form in diarrhœa depending upon dyspepsia; it has, however, nothing to recommend it in preference to the numerous analogous articles of the Materia Medica: some have praised it beyond its deserts in intermittent fever, and it was more especially celebrated as a remedy for dysentery. It is a drug of very questionable utility.

SINAPIS SEMINA—*The Seed of the Sinapis nigra—Mustard.*—The acrimony of mustard-seeds appears to reside in a volatile oil, which may be obtained by distillation; they also yield fixed oil by pressure, and abound in mucilage, starch, and a principle analogous to gluten, which affords ammonia on decomposition.

Mustard-seed is a valuable condiment and stimulant; in the dose of about two drachms, coarsely powdered, it generally proves emetic. Applied externally, in a poultice, it acts as a rubefacient, and excites considerable cuticular inflammation; hence the application of *sinapisms* to the legs and feet, in certain cases of determination of blood to the head.

The bright yellow powder, sold under the name of *flour of mustard*, and used at the table, is a compound of powdered black and pale mustard-seed, Cayenne pepper, wheat-flour, and turmeric.

SODÆ MURIAS—*Muriate of Soda—Sea Salt.*—We shall have to speak at length of the composition of this substance in the second part of this work, as also to point out its various and important uses in pharmaceutical chemistry. As an article of the Materia Medica, it is chiefly limited to external application as a stimulant, and strong brine has been successfully applied to indolent tumours. The benefit derived from sea-bathing, and especially from warm sea-baths, is partly to be ascribed to the cuticular stimulation excited by the salt.

There are several varieties of salt, known under different names in commerce, but they differ from each other chiefly in respect to aggregation and form, and are, chemically speaking, identical. Those kinds of salt which deliquesce considerably in moist weather, generally derive that quality from containing muriate of magnesia.

Common salt is scarcely more soluble in hot than in cold water, requiring about two and a half parts for its solution. Its use and advantages as a condiment are universally known, —as a medicine, a draught of salt water taken in the morning fasting has been successfully resorted to as a remedy for worms,—even the tape-worm has been thus expelled; practitioners, however, generally resort to more effective anthel-

mintics. Externally applied, salt and water will sometimes disperse indolent glandular tumours and wens: a piece of flannel moistened with brine should in such cases be kept continually on the part.

A pound of salt dissolved in a gallon of water produces a brine nearly equivalent in strength to sea water, of which a pint contains—

Common Salt	180.5
Muriate of Magnesia	18.3
——— Lime	5.7
Sulphate of Magnesia	21.6
	226.1

When meat has been long salted, it becomes indurated and proportionately indigestible and less fit for nutrition, while the salt stimulates the excretions, thus inducing debility and scorbutic affections.

SODÆ SUBBORAS—*Subborate of Soda*—*Borax.*—This salt is chiefly imported from India in an impure state, under the name of *tincal:* it is purified by gentle calcination, solution, and crystallisation. It has a styptic and alkaline flavour, and is soluble in about twenty parts of water at 60°. When heated, it loses water of crystallisation, and swells up into a light porous mass (*calcined borax*), which at a higher temperature fuses into a transparent glass, which soon finds its way through earthen crucibles.

The composition of borax is by no means accurately determined, though Bergman's Analysis is generally quoted, which represents it as containing, in its crystallised state, 34 boracic acid, 17 soda, 49 water. It has lately been manufactured in England, by the addition of soda to *native boracic acid* imported from Italy, and coming originally from the Lipari Islands.

Borax is considered a good detergent application in the thrush of children, and it certainly is effectual in cleansing aphthous excoriations. The *mel boracis* of the Pharmacopœia may be conveniently used in these cases, but it generally

requires dilution with an equal portion of clarified honey: about an eighth part of tincture of myrrh is a good addition.

The following gargle and mouth-wash is a pleasant application to the throat and gums when under the influence of mercury:—

℞ Boracis Pulver. ʒij.
Aquæ Rosæ f ℥vij.
Mellis Despumat.
Tincturæ Myrrhæ, āā f ℥ss. M.

SODÆ SULPHAS—*Sulphate of Soda.*—This is a well-known saline aperient, the virtues of which were first set forth in glowing terms by its celebrated discoverer Glauber, under the name of *sal mirabile*. It has a saline, cooling, and bitter taste, and requires about three parts of cold and one of boiling water for its solution when in crystals: these are composed of—

1	proportional of Sulphuric Acid...	= 40	.....	24.70
1	——————— Soda	= 32	.....	19.75
10	——————— Water ....9×10	= 90	.....	55.55
		162		100

Crystallised sulphate of soda therefore contains more than half of its weight of water, part of which it loses by exposure to air, effloresing into a white powder. When heated it fuses, and at a dull red heat loses water to the amount above stated. It sometimes liquefies in very warm climates, and therefore should be previously dried if intended for equatorial consumption, it being only necessary to recollect that half an ounce of the *dried* sulphate is equivalent to about an ounce of that in *crystals*.

Sulphate of soda has gone much out of fashion as a saline aperient, being quite as disagreeable, less active, and more apt to excite thirst than sulphate of magnesia. About an ounce of the crystallised salt, with any of the usual concomitants, is a dose.

The Pharmacopœia has given a formula for the prepara-

tion of this salt; but the market is exclusively supplied by the wholesale manufacturers, it being abundantly produced in a variety of chemical processes conducted upon the large scale.

SODA IMPURA — *Impure Soda.*—Many varieties of impure carbonate of Soda occur in the markets, such as *barilla*, *kelp*, *native natron* of India and Africa, and a manufactured article, prepared chiefly in France, under the name of *soude factice.*

Barilla is the residue of the combustion of the *salsola soda*, which is abundantly cultivated upon the Mediterranean coasts of Spain; kelp is the similar residue obtained by the combustion of several varieties of sea-weed, especially the *fucus serratus* and *fucus vesiculosus.* Upon the western coast of Scotland, and in the Hebrides, kelp is largely prepared. The native carbonate of soda is abundant in Africa, in the vicinity of Fezzan; it has been also imported from India and from South America. The *soude factice* is chiefly prepared by calcining sulphate of soda with chalk and charcoal; the residue of this operation is lixiviated, and the substance thus obtained subjected to calcination*.

Carbonate of soda is separated in a pure form from these sources by lixiviation and crystallisation; its primary form is, according to Romé de Lisle, an octoedron with a rhombic base, which is variously modified. It dissolves in twice its weight of water at 60°, and in less than its weight of boiling water. The crystals, which are efflorescent, fuse at a temperature of about 150°, and, losing water of crystallisation, dry into a white friable mass. They consist of—

1 proportional of Soda	= 30	29.95
1 —————— Carbonic Acid	= 22	14.40
11 —————— Water ..... 9×11	= 99	64.65
	153	100

Four hundred and sixty grains of dilute sulphuric acid, of the specific gravity 1.141, neutralise 100 grains of *dry* car-

* Aikin's Dictionary, Art. *Muriate of Soda.*

bonate of soda; a datum from which the value of any sample of the impure alkali may be deduced. (See *Potassa impura*, p. 143.) The medical uses of the purified carbonate of soda will be found under the head of *Sodæ Subcarbonas*, among the "*Præparata et Composita.*"

SPARTII CACUMINA — *The Tops of the Spartium scoparium, or common Broom.*—Decoction of broom tops is diuretic and aperient, and has been used in dropsy; so have the powdered seeds; but neither one nor the other are entitled to any confidence.

SPIGELIÆ RADIX—*The Root of the Spigelia Marilandica, or Indian Pink.*—In doses of from twenty to sixty grains, the powder of this root has been administered as an anthelmintic; it operates briskly upon the bowels, and any active purge will occasionally expel lumbrici and ascarides.

SPIRITUS RECTIFICATUS — *Rectified Spirit.*—Its specific gravity is to that of distilled water as 835 to 1000.)

SPIRITUS TENUIOR — *Proof Spirit.*—(Its specific gravity is to that of distilled water as 930 to 1000.)

By reference to Mr. Gilpin's tables*, it appears that spirit of the specific gravity of 835 (*spiritus rectificatus*), at the temperature of 60°, contains 96.50 parts *per cent., by measure*, of alcohol, of specific gravity 825, which is as low as it can be obtained by ordinary distillation; and spirit of specific gravity 930 (*spiritus tenuior*) contains, according to the same authority, 56.36 *per cent.* of the same standard alcohol, also *by measure;* or *equal weights* of alcohol and water.

Rectified spirit is an important pharmaceutical agent for the formation of tinctures and various other solutions, and in a diluted state forms a powerful and generally acting stimulant. As such, we employ it in a variety of tinctures; in brandy, rum, and other cordials; and in the different wines: the latter contain acid, and, generally, colouring matter, and

* Philosophical Transactions, 1794.

derive various flavours and qualities from the mode of fermenting, the nature of the grape, of the soil, and of the climate.

The effect of diluted alcohol in any of these forms, is to excite every part of the system, to render the pulse full and quick, to exhilarate the mind, and augment the tone of the muscles: hence their use, under due limitations, in all cases of debility, selection being made of such particular liquor as is best suited to the individual case.

The relative strengths of the different wines &c. in common use, may be judged of from the following table; but it must always be remembered that what is commonly called the *strength* of wine, which is a direct product of *fermentation*, depends upon alcohol in chemical combination with its other ingredients; and that the effects of wine upon the constitution are very different from those of diluted spirits, such as brandy, rum, gin, and other similar products of *distillation*.

	Proportion of Spirit per cent. by measure.
1. Lissa	26,47
Ditto	24,35
Average	25,41
2. Raisin wine	26,40
Ditto	25,77
Ditto	23,20
Average	25,12
3. Marsala	26,03
Ditto	25,05
Average	25,09
4. Port	25,83
Ditto	24,29
Ditto	23,71
Ditto	23,39
Ditto	22,30
Ditto	21,40
Ditto	19,00
Average	22,96
5. Madeira	24,42
Ditto	23,93
Ditto (Sercial)	21,40
Ditto	19,24
Average	22,27
6. Currant wine	20,55
7. Sherry	19,81
Ditto	19,83
Ditto	18,79
Ditto	18,25
Average	19,17
8. Teneriffe	19,79
9. Colares	19,75
10. Lachryma Christi	19,70
11. Constantia, white	19,75
12. Ditto, red	18,92
13. Lisbon	18,94
14. Malaga (1666)	18,94
15. Bucellas	18,49
16. Red Madeira	22,30
Ditto	18,40
Average	20,35
17. Cape Muschat	18,25
18. Cape Madeira	22,94
Ditto	20,50
Ditto	18,11
Average	20,51
19. Grape wine	18,11
20. Calcavella	19,20
Ditto	18,10
Average	18,65
21. Vidonia	19,25
22. Alba Flora	17,26
23. Malaga	17,26
24. White Hermitage	17,43
25. Rousillon	19,00
Ditto	17,26
Average	18,13
26. Claret	17,11
Ditto	16,32

	Proportion of Spirit per cent. by measure.
Claret	14,08
Ditto	12,91
Average	15,10
27. Malmsey Madeira	16,40
28. Lunel	15,52
29. Sheraz	15,52
30. Syracuse	15,28
31. Sauterne	14,22
32. Burgundy	16,60
Ditto	15,22
Ditto	14,53
Ditto	11,95
Average	14,57
33. Hock	14,37
Ditto	13,00
Ditto (old in cask)	8,88
Average	12,08
34. Nice	14,63
35. Barsac	13,86
36. Tent	13,30
37. Champagne (still)	13,80
Ditto (sparkling)	12,80
Ditto (red)	12,56
Ditto (ditto)	11,30
Average	12,61
38. Red Hermitage	12,32
39. Vin de Grave	13,94
Vin de Grave	12,80
Average	13,37
40. Frontignac	12,79
41. Côte Rotie	12,32
42. Gooseberry wine	11,84
43. Orange wine,—average of six samples made by a London manufacturer	11,26
44. Tokay	9,88
45. Elder wine	8,79
46. Cider, highest average	9,87
Ditto, lowest ditto	5,21
47. Perry, average of four samples	7,26
48. Mead	7,32
49. Ale (Burton)	8,88
Ditto (Edinburgh)	6,20
Ditto (Dorchester)	5,56
Average	6,87
50. Brown stout	6,80
51. London porter, (average)	4.20
52. Ditto small beer (ditto)	1.28
53. Brandy	53,39
54. Rum	53,68
55. Gin	51,60
56. Scotch Whiskey	54,32
57. Irish ditto	53,90

Of the wines in the above list, the strongest, such as Port, Madeira, and Sherry, are those in most common use in this country.

Port, in its new and unadulterated state, is a rough, strong, and slightly sweet wine; but when duly kept in bottle, it deposits a considerable portion of its astringent and extractive matter, loses the greater part of its sweetness, acquires an improved flavour, and retains its strength. Various proportions of brandy are almost always added to port wine before it comes to this country, to which much of its heat upon the palate, and powerfully stimulating effect upon the constitution, must be ascribed, when taken in its new state. If too long kept in bottle, nearly the whole of its colouring and astringent matters are deposited; it loses flavour; and becomes much less agreeable, both to the palate and stomach.

Good port wine, duly kept, is, when taken in moderation, one of the most wholesome of vinous liquors; it strengthens the muscular system, assists the digestive powers, accelerates

the circulation, exhilarates the spirits, and sharpens the mental energies. Indulged in excess, it is, perhaps, the most mischievous of the wines, and most likely to produce those permanent derangements of the digestive organs, that obtuse state of the faculties of the mind, and those obstinate organic affections, which follow the habitual use of distilled spirituous liquors.

Madeira, as a stimulant, exceeds port. It agrees well with the stomach, and, when in fine condition, may truly be called a generous wine, particularly well adapted for the resuscitation of debilitated constitutions, and for exciting the nervous system in typhoid weakness. But, unfortunately, good Madeira wine is rarely to be procured; it is no longer made of the same excellence as formerly, and the trade overflows with a variety of inferior and mixed wines, of all prices and denominations, to which the name of Madeira is most undeservingly applied. In its purest form, Madeira generally is more acid than either port or sherry, and is consequently not so well adapted to stomachs inclined to dyspeptic acidity, where it is usually complained of as peculiarly heating and irritating.

Sherry, of a due age and good condition, is an extremely fine and wholesome wine, free from any excess of acid matter, and possessing a dry aromatic flavour and fragrancy, which renders it a fit stimulant for delicate stomachs; as such, it is among the most valuable articles of the Materia Medica. But, as procured in the ordinary market, it is of most fluctuating quality, and very often destitute of all aroma, tasting of little else than alcohol and water.

Of these wines, the quantity which may be taken with impunity, and the proportion requisite to fulfil certain indications in disease, is entirely dependent upon their quality; and they accordingly either produce the genial effects of genuine fermented liquors, or the more boisterous excitement of the products of the still, even when taken with due moderation. Thus it is, that a single glass of tavern wine often heats, and creates headach, and disturbs digestion, in persons who are not habitually accustomed to the compounds which, at such places, are distributed under the name of wine. Such effects are sometimes so marked as to be referred to pernicious

adulterations of the liquor; but, in the numerous samples of wine, of suspected purity, which I have examined, I never found any poisonous ingredient; and, though lead, in minute quantities, may often be detected in wines, especially in Madeira, it invariably is derived from shot in the bottle, or some analogous source, and is most evident in that wine, in consequence of its superior acidity, and consequent tendency to oxidize and dissolve the lead. In one instance I detected arsenic in a bottle of sherry, but it was confined to the single bottle, and traced to a cattle-lotion which it had previously contained. Upon the whole the prevalent custom of putting wine into washed bottles which have not previously contained it, cannot be too strongly or justly reprobated.

Among the French wines, which in delicacy of flavour and care in manufacture exceed all others, *Burgundy*, and the various branches of that family, are peculiarly heating and soporific; and, when new, two or three glasses frequently excite a singular degree of temporary fever, attended by a full and hard pulse, flushed face, and headach; but the symptoms soon subside, and are followed by no inconvenience. These wines, however, should be cautiously indulged in by all persons in whom suddenly increased vascular action is liable to produce any thing more than temporary effect. Burgundy is a wine not less celebrated for the exquisite delicacy of its flavour and odour, than for the uncertainty with which it retains them. Sometimes it preserves its excellence unimpaired for many years; at others, it becomes insipid, vapid, discoloured, and decomposed, in as many months. Any sudden change of temperature is particularly inimical to this wine, which should always be preserved in a *cool* but not a *cold* cellar; and for the same reason, it should be transported from one country to the other in very temperate weather, the thermometer ranging between 50° and 60 .

The *wines of Bourdeaux* are distinguished by a delicacy of flavour, and by a more perceptible combination of the acid with the vinous flavour (though quite independent of acescency), than is perceived in most other genuine vinous liquors: they are less heating and more aperient than other wines, and agree well with the stomach when taken in moderation; if in excess, they excite acidity and indigestion, often rather from the

quantity than quality. But the *clarets* of our wine-merchants are often very substantial wines, being compounded in various ways for the English market: they are thus often mixed with hermitage, and with raspberry brandy; and if procured through doubtful channels, as we find them at taverns, they are too frequently acescent, and apparently composed of some claret, mixed with faded port, or other spoiled wines. The clarets, however, derived from respectable sources, are agreeable and comparatively innoxious wines; they are moderately exhilarant, and have a tendency to relax the bowels and increase the flow of urine: they are the wines fitted for those persons who are easily excited, and in whom the stronger wines readily produce febrile action; and in that state of the system which is connected with a tendency in the urine to deposit white sand, a state which some physicians have denominated the *phosphatic diathesis*, claret may be regarded as an effective remedy.

Hermitage, especially the red, *Côte-rotie*, *Rousillon*, and a few other wines of rare occurrence, occupy a place intermediate between port and claret, considered as to strength, and often also in regard to flavour. These wines require age for their perfection, and Rousillon, if originally of fine quality, is not in perfection unless it has been ten or twelve years in bottle.

Champagne wines admit of division into two classes, the sweet and sparkling, and the dry and still. These differences arise partly from the mode of managing the fermentation and bottling of the wine, and partly from the circumstances of growth and situation of the vines, the sunny side of a hill yielding fruit fit for the production of the sweet wine, and the opposite aspect affording grapes calculated for the manufacture of a strong but dry wine. The *effervescent varieties* of champagne, if not taken in excess, are the most speedily exhilarating of all wines; they soon produce an approach to intoxication, which is very transient, and generally harmless; but, indulged in to any excess, their effects are more than ordinarily pernicious, and they then stand unrivalled in the headach, nausea, sickness, and universal derangement of the system, which they create. In habits tending to the formation of uric acid, and in constitutions subject to *red* deposits

in the urine, or to affections of a gouty character, champagne, even in moderation, is certainly more apt than other wines to create painful sensations in the region of the kidneys, and in the small joints of the hands and feet. It is well known to have brought on fits of gravel and of gout; yet are there some gouty persons who indulge in champagne with at least temporary impunity, though in all such cases prudence forbids its use. So many persons complain of violent headach, even after a single glass of good champagne, that it should be interdicted wherever there is a tendency to such affections, from whatever cause they may arise.

Still champagne is often a strong and very heating wine, very deceitful in these respects to the palate. When of superior quality, it has the singular aromatic flavour of champagne in an eminent degree, a flavour which also exists, but is covered by carbonic acid, in the sparkling wine. The latter should, therefore, not be drunk till the active effervescence has subsided, by those who would relish this characteristic quality. The prevalent notion that a glass of champagne cannot be too quickly swallowed, is very erroneous, and shows great want of taste in respect to the peculiar excellence of this wine; to such persons a glass of perry or of gooseberry wine is as acceptable as one of champagne; further, it is no bad test of the goodness of sparkling champagne to leave it exposed for some hours in a wine-glass, when, if originally of the higher order, it will be found to have lost its carbonic acid, but entirely to retain its body and flavour. The coloured champagnes are usually tinted with cochineal, and there are several other varieties of this wine which require no particular notice: many of them, though genuine, are of a very inferior description, and quite deficient in *bouquet* and flavour.

The class of *sweet wines* or *vins de liqueur*, as the French term them, require little notice in this place, being rarely taken in doses exceeding one, or at the utmost two small glasses. Many of them are potent, aromatic, and cordial; and they are generally more agreeable to the palate than the stomach, with which they eminently disagree if indulged in beyond the usually prescribed quantity.

A great variety of wines are made in Italy, and in the more southern parts of Europe, which, however, are of rare

occurrence, and chiefly found at the tables of the curious. Of these, some few are of excellent quality, but in general they are carelessly made, and, from inattention to cleanliness and to the state of the fruit, they are of inferior or even disagreeable flavour. With the exception of *Constantia*, all the wines imported from the Cape of Good Hope are also defective in the most essential qualities of good wine.

Among the home-made wines, a few are drinkable, and many might be considerably improved; but the necessity of selecting perfect and healthy fruit, and the extreme care and cleanliness requisite in all steps of the manufacture, are here so little attended to, as, with very few exceptions, to render all these products quite unworthy of comparison with those previously described. They commonly contain a large quantity of unfermented sugar, or they have become *pricked* in consequence of the production of a little vinegar, and hence are extremely apt to disorder the stomach.

It may not be out of place here to remark, that the acidity of stomach and other symptoms of indigestion which follow occasional indulgence in wine, may, to a great extent, be prevented by a dose of magnesia at bedtime, which saturates the acid in the stomach, allays the febrile action, and passes off the next day by the bowels. Other absorbents, in conjunction with mild bitters, may be resorted to; and by such a plan the disturbance of the urinary secretion, and the continued dyspepsia, which often lasts for some days, may be checked at its commencement.

In regard to *porter*, *ale*, and other varieties of *beer*, considering them as occasional remedies in the cure of disease, it may be remarked that they rarely agree with the stomach, except among the lower orders, who are in the habit of copious indulgence in those coarser products of fermentation. Hence it is that, under such circumstances, beer may be administered to convalescents with more advantage than wine; it is a less stimulating, but more nutritive and soporific beverage; it induces more fulness of the system; and habitual indulgence in it generally fattens, creates a plethoric state of habit, and induces apoplexy, or some of the minor symptoms of vascular turgidity.

SPONGIA—*Sponge*.—The residue of the combustion of this substance has long been used in medicine, under the name of *burnt sponge*, as a remedy in certain glandular affections, especially in bronchocele; and its efficacy has been ascribed sometimes to its saline contents, at others to the carbonaceous matter in which it abounds. The discovery of *iodine* has thrown new light upon this subject, and certain *iodic salts* have been detected in the coal of sponge, to which its medicinal activity has, with much plausibility, been referred, and which have therefore been admitted into some Pharmacopœiæ.

Iodine has been administered in bronchocele in various forms and combinations: though very sparingly soluble in water, it readily dissolves in alcohol, and this furnishes a good means of dividing it into convenient doses. Of a solution of thirty-six grains of iodine in an ounce of alcohol, ten drops have been given three times a day, in any viscid liquid; this dose has been gradually increased to twenty drops, which has generally proved effectual. Alcoholic solution of iodine suffers a change when long kept, in consequence of the decomposition of a portion of the alcohol, but the medical virtues of the solution are probably not impaired.

Hydriodate of potassa, as it is usually called, is another form of iodine, which is also used in similar cases. It may be prepared by evaporating to dryness a saturated solution of iodine in liquid potassa, fusing the residue, out of the contact of air, in a platinum crucible or a Florence flask, by which iodide of potassium is obtained, and which, when dissolved in water, in the proportion of forty-eight grains to an ounce, affords a solution which may be given in doses of from ten to thirty drops.

A third form in which iodine has been exhibited is that of *ioduretted hydriodate of potassa*, prepared by dissolving thirty-six grains of hydriodate of potassa, and ten grains of iodine, in an ounce of distilled water. Six to ten drops are given three or four times a day in syrup and water, or other convenient vehicle.

Ointments of iodine have also been employed in cases

where it disagrees with the stomach, and as auxiliaries to the other forms. Of an ointment composed of an ounce and a half of hog's lard and half a drachm of hydriodate of potassa, a piece of the size of a hazel-nut may be rubbed in upon the enlarged gland night and morning.

In any of these forms, iodine appears to act as a powerful stimulant upon the absorbent and lymphatic system, and has been tried in various forms of scrofula, and several cases of indolent glandular tumours, with no inconsiderable success: it is, however, in decided *goître* that its effects are least equivocal; these tumours it softens, and gradually excites their absorption, especially where there is no local inflammatory action, (which ought to be subdued in the first instance by proper treatment,) and where the patient is not of a nervous or very feeble habit. If any febrile symptoms intervene, it should be discontinued; also where it accelerates the pulse to any great extent, or where it occasions cough, nervous restlessness, obstinate diarrhœa, and emaciation, which is sometimes the case to a very alarming extent. In the hospitals of Paris it is said that iodine is used as a palliative in cancer*.

STANNUM—*Tin.*—*Tin filings and powder of Tin* were once employed as anthelmintics: but they are a dangerous remedy, the use of which is now very properly superseded by that of more effectual and safe medicines. They should not have been retained in the Pharmacopœia.

STAPHISAGRIÆ SEMINA—*The Seed of the Delphinium Staphisagria, or Stavesacre.*—These seeds are violently cathartic and emetic. Their use is confined to external application, especially mixed with hair-powder, for the destruction of lice. They might, however, well be omitted in our present Materia Medica. They contain a peculiar salifiable base, called *delphinia*, which may be procured by boiling magnesia in the decoction of the seed, filtering, and treating the residue upon the filter with alcohol; upon evaporating the latter,

* See Coindet's Papers and the abstracts of them, in vols. x. xi. xii. and xiv. of the Quarterly Journal:—also Dr. Gairdner's Essay.

delphinia remains in the form of very minute crystals, eminently poisonous*.

STRAMONII SEMINA ET FOLIA — *The Seeds and Leaves of the Datura Stramonium, or Thorn-apple.* — This herb is stimulating and narcotic, but less certain in its action as a sedative than numerous other articles of the Materia Medica, which are very properly substituted for it. It contains, according to Brandes, a salifiable base, to which its active powers are referrible, which may be called *daturia*†. When the dried plant is smoked, in the manner of tobacco, it is said to be highly effectual in the relief of spasmodic asthma; but the exorbitant praises originally bestowed upon its virtues have been by no means sanctioned by experience‡. In over-doses it produces the usual alarming symptoms of this class of poisons.

According to Dr. Marcet, the extract of the seeds is more active than that prepared from the whole plant, but in other respects the virtues of the two are analogous: he recommends it in cases of chronic disease attended with acute pain, in doses of from one-eighth of a grain to one grain: it appears to have been eminently successful in sciatica||.

STYRACIS BALSAMUM—*The Balsam of the Styrax officinale.*—This is a perfectly useless incumbrance to the list of Materia Medica. It is among the stimulating expectorants of old writers; but is never met with pure in the shops, and is entirely rejected from modern practice.

* Lassaigne and Feneulle, Annales de Chimie et Physique, tom. xii. p. 358.

† Journal de Physique, tom. xci. p. 144.

‡ "The indiscriminate use of the smoke of stramonium has occasioned dangerous or hurtful effects in frequent instances. In some cases of aged or apoplectic subjects, death has been the consequence. No considerate physician can countenance the latitude of its application, or advise its use without well knowing the nature of the case of asthma on which he is consulted."—*Dr. Bree on Disordered Respiration*, 5th edit. p. 367.

|| Med. Chir. Trans. vol. vii. p. 551. See also vol. viii. p. 594, in reference to the preparation and properties of the extract.

SUCCINUM—*Amber*.—This is probably a resin of antediluvian origin. It occurs associated with coal and bituminous wood, and also in a conglomerate upon the sea-shore, from which it is washed out by the waves. It has been obtained most abundantly in Prussia, and upon the shores of the Baltic. In Poland it has been met with in an inland sandy soil, mixed with pine cones. It has also occurred imbedded in limestone and gypsum.

Amber is not used in medicine; but when subjected to destructive distillation, it affords an acid and oil, both of which have a place in some Pharmacopœiæ, though the latter is now only retained by the London College. Their preparation and properties will be found under the head of *Oleum Succini*, among the "Præparata et Composita."

Amber is sometimes mixed with various resins, and especially with fragments of copal, which are detected by their difference of fracture and colour, and by not exhaling the peculiar odour which amber does when put upon a hot iron.

SULPHUR—SULPHUR SUBLIMATUM.—Sulphur occurs *native*, associated with gypsum, limestone, and sulphate of strontia. It is also abundant among volcanic products, and in union with various metals forms some of the most abundant and important metallic ores; such are the sulphurets of copper, of lead, of mercury, &c.

Native sulphur is imported into England from Sicily and Naples, and largely consumed by the manufacturers of sulphuric acid and of gunpowder, and by the bleachers of cotton goods.

Roll sulphur is chiefly obtained by roasting sulphuret of copper; it is collected in a chamber of brick-work, through which the fumes of the heated ore are made to pass, and afterwards purified by fusion and cast into sticks.

Sublimed sulphur, or *flowers of sulphur*, is obtained by heating sulphur up to 500° or 600°, when it rapidly rises in vapour, and is condensed in sufficiently capacious receptacles, in the form of a fine powder; the residue is called *sulphur vivum* in old Pharmacopœiæ.

Sublimed sulphur, or very finely powdered native sulphur, is medicinally used as a gentle laxative and diaphoretic. It

is best administered in the form of electuary, and may be taken in the dose of a drachm or two twice or thrice a day, so as gently to act upon the bowels. In this way it relieves hæmorrhoidal affections of the rectum: it has also gained celebrity in the cure of chronic rheumatism. When its use is continued for some time, its odour is often very manifest upon the skin, especially when aided in that direction by other diaphoretics, or when administered in warm weather.

In scabies, sulphur is a specific; and in some cutaneous eruptions it proves highly serviceable, both as an external application and an internal remedy. Its odour in the form of ointment is best covered by a little oil of bergamot or of lemon.

The celebrated remedy for chronic rheumatism called the *Chelsea Pensioner*, is an electuary composed of a drachm of guaiacum, two drachms of powdered rhubarb, an ounce of cream of tartar, two ounces of flowers of sulphur, one nutmeg in powder, and a sufficient proportion of clarified honey: two large tea-spoonsful to be taken night and morning.

Sulphur is subject to various contaminations, and roll sulphur especially is said to contain sulphuret of arsenic. Its purity may be determined by boiling 100 grains in four ounces of oil of turpentine: the solution is poured off while hot, and it deposits the sulphur it had dissolved, as it cools: the cold oil may then again be boiled on the residue, and again cooled, and this operation repeated as long as it dissolves any thing: the weight of the insoluble residue indicates the amount of impurity.

TABACI FOLIA—*Tobacco Leaves—the dried Leaves of the Nicotiana Tabacum.*—This plant is a native of America, but is cultivated in many parts of Europe. It is an eminently powerful sedative when administered internally in the form of infusion, but its use is limited in this respect to injection as an enema in cases of spasmodic constipation, of hernia, and of retention of urine*: its good effects, however, are unfortunately almost always very problematical, and the fainting fits which it occasionally induces are of a dangerous and

* Earle. Med. Chir. Trans. vol. vi. p. 83.

alarming nature. On the whole it is very doubtful whether it should ever be prescribed, excepting in very urgent cases, and then with the utmost caution. Even the external use of tobacco washes, which are sometimes employed to cure the itch, is dangerous, and should be prohibited. The *infusum tabaci* of the Pharmacopœia is the usual form for glysters; sometimes an injection of the smoke of tobacco is used as a substitute for the infusion, being more penetrating and equally powerfully sedative.

From Mr. Brodie's experiments, infusion of tobacco appears to occasion death by acting upon the heart, and producing fainting through the medium of the nervous system *. It appears, from some of his researches, that the action of the heart ceases even before that of the diaphragm.

TAMARINDI PULPA—*The Pulp of the Pod of the Tamarindus Indica.*—This fruit is chiefly imported from the West Indies. It is a grateful acid to allay thirst in febrile affections, and if largely eaten operates upon the bowels. It abounds in citric acid. In preparing *pulp of tamarinds*, or in preserving them with sugar, copper vessels should be avoided, as they are apt to become contaminated with that pernicious metal.

TARAXACI RADIX—*The Root of the Leontodon Taraxacum—Dandelion.*—A decoction of dandelion has long been celebrated on the Continent as a diet-drink in liver complaints and other chronic visceral affections; it operates as a diuretic and diaphoretic, and is slightly aperient. In certain cases of dyspepsia, much benefit is said to result from the use of this medicine in large doses. Dr. W. Philip says, "it is best adapted to those cases in which the bile is deficient or much disordered, while the power of the stomach is still considerable †."

In the treatment of chronic inflammation of the liver, Dr. Pemberton speaks highly of the effects of taraxacum, and recommends its trial in incipient scirrhus of that viscus, and

* Phil. Trans. 1811, p. 186. † On Indigestion, 4th edit. p. 254.

in several chronic derangements of the stomach *.—(See *Extractum Taraxaci*, in the second part of this work.)

Sometimes it is employed as an alterative in obstinate cutaneous eruptions; but in all such cases its medical efficacy is equivocal. It often happens, however, that during the use of diet-drinks, and analogous remedies, more strict attention is paid to the state of the stomach and bowels, and those kinds of food are abstained from which are rich and greasy, or which otherwise disagree with the stomach: this is done that the effects of the alterative plan may not be interfered with; and hence it is that, in many instances, the mere putting the patient upon a system which makes him more attentive to the state of the *primæ viæ* is useful in the removal of many complaints; cuticular eruptions especially are often mere symptoms of a state of stomach and bowels which is removed b a strict attention to diet.

TARTARUM—*Tartar—Impure Supertartrate of Potassa.*—This is the substance already spoken of under the head *Potassæ Supertartras*. It is useless as an article of the Materia Medica.

TEREBINTHINA CANADENSIS—*The liquid Resin of the Pinus balsamea—Canadian Turpentine.*—Like the other turpentines, this is a compound of a volatile oil and resin. It is obtained by incision from the bark of the tree, and imported in casks, in the form of a very viscid liquid; it has a fragrant odour, and a warm bitter taste; it is diuretic, and generally stimulant, but scarcely ever used in medicine; it is a valuable ingredient in transparent varnishes.

TEREBINTHINA CHIA—*Cyprus Turpentine*—is the produce of the *pistacia terebinthus*, a native of the south of Europe and of Barbary, cultivated in the islands of Chios and Cyprus, and not unfrequent in our gardens. This species of turpentine is fragrant and warm, but less acrid and bitter than the others, from which, however, it is not essen-

* On diseases of the Abdominal Viscera, p. 42.

tially different in medical virtues. It is said to be generally adulterated with common turpentine.

TEREBINTHINA VULGARIS—*The liquid Resin of the Pinus sylvestris, or Scotch Fir—common Turpentine.*—When this substance is distilled, it affords a volatile oil (*terebinthinæ oleum*), and resin (see *Resina Flava*) remains behind.

Oil of turpentine is a stimulating diuretic in small doses, and as such is often prescribed in gleets and other similar cases in which copaiba is used; sometimes it is useful in urinary sand, but in general it irritates the kidneys and disorders the stomach, when exhibited in such cases. In chronic rheumatism it is occasionally an effective stimulant, and deserves trial in obstinate cases.

The best form of administering oil of turpentine is to triturate it with mucilage or honey, and thus diffuse it through some aromatic water.

℞ Olei Terebinthinæ ℳxv.
Mellis ʒiss. tere simul et adde
Aquæ Cinnamomi f ʒx.
M. fiat haustus ter die sumendus.

The dose, in many constitutions, may be increased to thirty or forty drops.

Oil of turpentine is the most effective of the anthelmintics, and especially in the expulsion of tape-worm; in such cases it requires to be given in doses of from half an ounce to two ounces, repeated night and morning till the bowels are evacuated and the worm dislodged; and should the second dose not operate, some castor oil should be given to aid its purgative powers *. It is remarkable that, in these large doses, oil of turpentine rarely proves to any extent diuretic, though it communicates to the urine the violet odour peculiar to all the turpentines, when they pass off by the kidneys. In these doses, the oil is best given with a little aromatic water

* Fenwick. Med. Chir. Trans. vol. ii. p. 24.

only, or it may be blended with honey or mucilage. It usually nauseates and excites eructations from the stomach; an effect to a great extent prevented by a little brandy. Dr. Paris advises large doses of oil of turpentine in certain cases of obstinate constipation, depending on affections of the brain *; and Dr. Latham has found it useful in epilepsy. In some cases of constipation it has been used as an enema, in the proportion of an ounce, rubbed with the yolks of two eggs, and diffused through a pint of thin starch †. As a stimulant, oil of turpentine is applied in liniments, blended with camphor, ammonia, and other rubefacients; and applied to bleeding vessels it often operates as an effectual styptic. The stimulating application sold under the name of *Whitehead's Essence of Mustard* is composed of camphor and oil of rosemary, dissolved in oil of turpentine, with a little flour of mustard added to it.

TESTÆ—*The Shells of the Ostrea edulis—Oyster-Shells.*—The varieties of shell have been shown, by the analysis of Mr. Hatchett ‡, to consist of carbonate of lime, with a variable proportion of animal matter, which is gelatinous or membranous in the porcellaneous shells, but albuminous or cartilaginous in the mother-of-pearl shells. It was formerly customary to employ many varieties of carbonate of lime derived from such sources, but prepared chalk may in all cases be used as a substitute; and it is difficult to say why oyster-shells retain their place in the present list of the Materia Medica.

TIGLII OLEUM—*Oil of Croton—the expressed Oil of the Seeds of the Croton Tiglium.*—Every part of this plant is said to be purgative, but the seeds are especially so, and used formerly to be employed in pharmacy under the name of *Molucca grains*. Their expressed oil has been lately re-introduced as a

* Pharmacologia, vol. ii. p. 415.

† A very singular case of locked jaw in an hysterical young woman, cured by a glyster of oil of turpentine, is related in the Medico-Chirurgical Transactions, by Dr. E. Philips, vol. vi. p. 65.

‡ Philos. Trans. 1799.

very powerful cathartic, in cases of obstinate and protracted constipation, or where a violent evacuator is required, as in some cases of apoplexy and injury of the brain, and in certain convulsive, hypochondriac, and maniacal affections. The average dose for an adult is one or at the utmost two drops; and perhaps the best or at least the most active form for exhibiting it, is in a pill with bread crumb; it may also be rubbed down with mucilage, and so diffused in half an ounce or an ounce of any aromatic water; but the violence of its operation is certainly somewhat diminished by this kind of dilution.

℞ Mucil. Acaciæ ʒj.
Ol. Tiglii gutta una; tere simul et adde
Aquæ Menthæ viridis fʒvj.
M. fiat haustus purgans.

This quantity sometimes proves violently operative, emptying the bowels completely of their contents, and exciting a very copious watery secretion from them. Larger doses have been given without effect, but this remedy should always be administered with the utmost caution. It should also be remembered that different samples of the oil differ extremely in activity.

TORMENTILLÆ RADIX—*The Root of the Tormentilla officinalis.*—This is a powerful astringent, and may be substituted for many other analogous remedies already adverted to. It may be given in substance in doses of thirty or forty grains, or it may be used in infusion or decoction; but catechu is generally a preferable remedy.

TOXICODENDRI FOLIA—*The Leaves of the Rhus Toxicodendron—Poison Oak, or Sumach.*—This plant is a native of North America: its sap becomes black by exposure to air, and has been used as a dye and as marking ink. A grain of the powdered leaves, three or four times a day, is said to have been effectual in certain paralytic affections; but it is a remedy rarely employed, and upon which very little dependence can be placed. It appears to be a narcotic stimulant.

TRAGACANTHA—*The Gum of the Astragalus verus—Gum Dragon, or Tragacanth.*—This gum is chiefly produced in Persia, and exported from Aleppo. The best is in the form of white, semitransparent, contorted, and vermiform pieces, not very readily soluble in water, but softening and swelling in that liquid like cherry-tree gum. As an article of the Materia Medica, its virtues resemble those of gum arabic, to which it is preferred for many pharmaceutical purposes, as forming a more tenacious mucilage.

TUSSILAGO—*Tussilago farfara, or Coltsfoot.*—This is a very mucilaginous herb, and a decoction of its leaves is sometimes used as a demulcent and diluent in coughs and catarrhs. It has nothing to sanction its retention in the Materia Medica. Dr. Paris informs us that the nostrum sold under the name of *Essence of Coltsfoot* is a solution of tolu balsam in compound tincture of benzoin and spirit of wine, and consequently calculated to do infinite mischief in those affections of the chest for which the ignorant vulgar frequently employ it.

VALERIANÆ RADIX—*The Root of the Valeriana officinalis—Wild Valerian.*—The well-known fetid odour of this root, so enticing to cats, has given it some celebrity in nervous and hysterical affections. Its taste is warm and bitter, and it imparts its virtues to water, so that it is best administered in infusion or decoction; but its flavour is impaired by long boiling. As an antispasmodic and tonic, in certain nervous affections and morbid irritability, valerian is certainly useful, and upon the same principle it is no unimportant adjunct to cinchona in those stages of typhoid and nervous fevers where that remedy is indicated.

Speaking of the use of valerian, as a nervous tonic, Dr. Heberden says, "it has often been given without much apparent effect; but yet I have met with some whom it threw into such agitations and hurries of spirits, as plainly showed that it is by no means powerless. Most cats are fond of gnawing it, and seem to be almost intoxicated by it into outrageous playfulness; and the nerves of cats afford a very tender test of the powers which any substances possess of affecting the

nerves. The poisoned darts of the Indians, tobacco, opium, brandy, and all the inebriating nervous poisons, are far more sensibly felt by this animal than by any other that I know of an equal size *."

An ounce of the bruised root may be boiled for ten minntes with twelve ounces of water, and of this decoction two ounces may be taken two or three times a day, with the addition of a drachm of the tincture. Valerian sometimes appears to act as a vermifuge when taken in large doses. So considerable a proportion of valerian root consists of mere inert woody fibre, that the powder cannot be considered a commendable form for its exhibition. As an antihysteric it is usually conjoined with assafœtida, ammonia, and other nervous stimulants.

℞ Decoct. Valerianæ,
Misturæ Camphoræ, āā f℥ijss.
Tinct. Valerianæ Ammoniatæ,
Syrup. Aurant. āā f℥ss.
M. cochl. iij. pro dosi.

VERATRI RADIX—*The Root of the Veratrum album, or white Hellebore.*—According to MM. Pelletier and Caventou, the poisonous quality of this plant is referrible to a peculiar salifiable base, to which they have given the name *veratrine*, and which is identical with the active principle of colchicum (see page 66). The whole plant is eminently acrid and poisonous; the root is pungent and bitter, and when fresh has a peculiar odour, which, with much of its acrimony, is lost on drying: it has a greyish-yellow colour, breaks short, and is wrinkled upon the surface. It is said to be occasionally mixed with gentian, and like that plant it grows in the mountains of Germany, Switzerland, and the North of Europe.

The operation of white hellebore is so violent that it is very rarely used internally; it purges and vomits even in small doses, and in larger ones excites fainting, convulsions, and excessive and dangerous debility. Although, therefore, it has been prescribed in some cases of mania, of epilepsy, and

* Commentaries, 3d. edit. p. 357.

paralysis, the uncertainty of its effect has induced modern practitioners to reject it. It is sometimes used largely diluted with some inert powder, as a sternutatory in paralytic affections, and especially in gutta serena; but it is not preferable to other safer remedies. The decoction is occasionally prescribed as a lotion in scabies and some other eruptive disorders; and it is a favourite ingredient in the washes used by cattle-doctors. It often proves, however, even in this way, dangerously active.

ULMI CORTEX—*The Bark of the Ulmus campestris, or common Elm.*—A decoction of elm-bark has been recommended in herpetic eruptions as an internal remedy. It appears to have very little efficacy of any kind, and might well be discarded from the Pharmacopœia.

UVÆ PASSÆ—*The dried Fruit of the Vitis vinifera—Raisins.*—Their medical virtues are none.

UVÆ URSI FOLIA—*The Leaves of the Arbutus Uva Ursi—the Trailing Arbutus, or Bear Berry.*—The leaves of this plant are astringent and sweetish-bitter: in the form of powder they have been given in doses of from twenty to sixty grains, in calculous affections and diseased kidney, but with very doubtful benefit. They may also be used in decoction, as a tonic, for which half an ounce of the bruised leaves may be boiled for ten minutes in twelve ounces of water, and strained. Uva ursi has probably no efficacy beyond that of a mere astringent.

ZINCUM—*Zinc.*—This metal is not used in medicine in its pure form. Its oxide and some of its salts, especially the sulphate, are valuable remedies.—(See Part II.) The specific gravity of zinc is about 7.

ZINGIBERIS RADIX—*The Root of the Zingiber officinale—Ginger.*—This root is imported, preserved in syrup and in a dry state, from the East and West Indies. It should be sound, clear, and heavy; neither worm-eaten, very fibrous, nor in too small pieces. It imparts its flavour to water and

alcohol; the former also extracts from it a large portion of starch; the latter dissolves little else than its odorous and acrid principle. In the form of powder, ginger is a good carminative stimulant, and has been found of service in the flatulency and dyspepsia of gouty habits; it is a valuable adjunct to several other remedies, and especially effective in diminishing the griping tendency of senna, jalap, and some similar purges. When chewed, it promotes the flow of saliva, and often relieves toothach. Combined with rhubarb, it forms a good stomachic pill, especially in those cases where flatulency and rumbling come on before meals, and when the stomach is nearly empty.

℞ Zingiberis Pulver. ʒj.
Rhei Pulver. ʒss.
Olei Caryophillorum ♏v.
Misce et divide in pilulas xviij. quarum sumantur duæ vel tres ante prandium.

A MANUAL OF PHARMACY.

PART II.

PREPARATIONS AND COMPOUNDS.

A

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ACIDS.

Acidum Aceticum Dilutum. *Diluted Acetic Acid.*

℞ Aceti congium ;

Destillet Acidum aceticum dilutum balneo arenæ, ex retortâ vitreâ in receptaculum vitreum et frigefactum ; tum, primo octario rejecto, octarios sex proximè destillatos serva.

Take of Vinegar a gallon ;

Let the dilute Acetic Acid be distilled from a glass retort, placed in a sand bath, into a glass receiver kept cool ; then, having rejected the first pint which distils over, reserve the six succeeding pints.

Under the head *Acetum*, in the Materia Medica, the composition and properties of acetic acid are detailed. —(See page 4.)

When common vinegar is distilled, the first portion which passes over contains alcohol, and is therefore rejected. The next six-eighths, which are above directed to be retained, consist of dilute acetic acid, contaminated by a little empyreumatic matter, and a substance generally regarded as of a mucilaginous nature: the residuary eighth, remaining in the retort, is of a deep brown colour, very sour, strongly empyreumatic,

and contains free tartaric and malic acids, bitartrate of potassa, and a portion of vegetable matter having the characters of extractive.

Distilled vinegar is not always prepared in glass vessels, but generally in a copper alembic, to which a worm of pewter is adapted as refrigerator; hence the impurities sometimes found in this acid: an earthenware condensing pipe is preferable, but there is a difficulty in keeping it sufficiently cool in consequence of its bad conducting power in regard to heat: it might be made of silver, very thin, and would then be liable to no objection, as that metal is not acted on by acetic acid of any strength. A considerable improvement in the distillation of vinegar consists in using the heat of high-pressure steam for the purpose, instead of that of an ordinary open fire; the risk of empyreuma, which often takes place at an early period of the process, is thus prevented, and a larger portion may usually be distilled off before any foreign flavour is perceptible.

The usual specific gravity of distilled vinegar is from 1007 to 1009; in the latter case 1000 grains require 145 grains of crystallised carbonate of soda for their saturation, and it may be regarded as composed of one part by weight of the *acidum aceticum fortius* of the Materia Medica, and five of water. Dilute acetic acid thus prepared is in all respects preferable to that obtained by the distillation of vinegar, especially for pharmaceutical purposes. Its uses in medicine have already been adverted to (p. 7).

Acidum Benzoicum.

℞ Benzoini libram;

Vasi vitreo arenæ imposito Benzoinum immitte, et calore gradûs 300^{mi} adhibito et paulatim aucto, sublima donec nihil ampliùs ascendat: quod sublimatum est chartâ bibulâ involutum comprime, ut à parte oleosâ separetur: dein iterum sublima, calore non ultra gradum 400^{m} aucto.

Benzoic Acid.

Take of Benzoin, a pound;

Put the Benzoin into a glass vessel placed in a sand-bath; and having heated it to 300°, sublime, gradually increasing its temperature until no more acid rises; fold the sublimate in bibulous paper and press it, so as to free it from the adhering oil; then sublime it again at a temperature not exceeding 400°

This is the simplest, and, upon the whole, the most economical process for obtaining benzoic acid; good benzoin thus affording from 10 to 12 *per cent.* of the acid contaminated by empyreumatic oil, and about 8 or 9 *per cent.* of the purified acid. If it be desired to have benzoic acid in large prismatic crystals, it may be so procured by the slow evaporation of its alcoholic solution.

Benzoic acid, as it usually occurs, is in soft flocculent crystals, of an agreeable aromatic odour, sparingly soluble in cold water. Boiling water dissolves about one twenty-fifth of its weight, and deposits it copiously as it cools. Its taste is more sweet and pungent than acid, but it reddens delicate vegetable blues. Its ultimate components are carbon, oxygen, and hydrogen, but their relative proportions have been by no means accurately determined.

The utility of this acid in medicine is very problematical; it once had credit as a pulmonic stimulant, and was accordingly used in certain catarrhal and asthmatic affections, in doses of from ten to twenty grains. The only compound into which it enters in the present Pharmacopœia is the *tinctura camphoræ composita*, in which there is the same quantity of opium, so that the benzoic acid cannot be considered as possessing any efficacy in the doses in which it can there be administered. The best form for its administration is that of pill or electuary.

Acidum Citricum. — *Citric Acid.*

℞ Limonum Succi octarium,
Cretæ preparatæ unciam, vel quantum satis sit ad Succum saturandum,
Acidi sulphurici diluti fluiduncias novem;

Succo Limonum fervefacto Cretam paulatim adjice, et misce; tum liquorem effunde. Citratem Calcis, quæ remanet, aquâ tepidâ sæpius

Take of Lemon Juice, a pint,
Prepared Chalk, an ounce, or a sufficient quantity to saturate the Juice,
Diluted sulphuric Acid, nine fluid-ounces;

Add the Chalk by degrees to the hot Lemon juice, and mix them; then pour off the liquor. Wash the remaining Citrate of Lime repeatedly

renovatâ ablue; dein sicca. Tum pulveri exsiccato superinfunde Acidum sulphuricum dilutum, et coque per sextam horæ partem. Liquorem per linteum fortiter exprime, et per chartam cola; colatum leni calore consume, adeò ut, dum frigescit, fiant crystalli.

Crystallos, ut puræ sint, iterum et tertiò in Aquâ liqua, eamque toties cola, decoque, et sepone.

with warm water; then dry it. Add the diluted sulphuric acid to the dried powder, and boil it for ten minutes. Press the liquor forcibly through a linen cloth, and then filter it through paper; evaporate the filtered liquor by the aid of a gentle heat, so that crystals may form in it as it cools.

That the crystals may be pure, dissolve them a second and a third time in water, filtering, evaporating, and crystallising each solution.

When lemon juice is evaporated to the consistency of syrup, the separation of crystallised citric acid is prevented by the mucilaginous matter in which the juice abounds: hence the necessity of the above circuitous process originally devised by Scheele for obtaining the pure acid, in which citrate of lime is first formed and afterwards decomposed by the diluted sulphuric acid, which uniting to the lime forms sulphate of lime and liberates the citric acid. The products of the first evaporation of the filtered liquor above mentioned is a crop of brown crystals, previous to the formation of which, a considerable portion of sulphate of lime separates, which should be got rid of by filtration. The first crops of crystals are easily procured colourless by the second or third solution and crystallisation; but those which are afterwards obtained from the different residuary mother liquors retain their colouring matter more obstinately, and the solutions generally require to be discoloured by filtration through newly burnt charcoal, or by other means which suggest themselves to the experienced manufacturer.

It appears from Mr. Phillips's experiments, that fresh lemon juice of the specific gravity of 1044 is almost precisely equal in strength to distilled vinegar of the specific gravity 1009, since 100 grains of the former are saturated by 14.8 grains of carbonate of soda, and the same quantity of the latter by 14.5 grains *. He also states that a pint of lemon juice weighing fifteen ounces and six drachms and a half, decomposes a few

* Trans. of Pharm. p. 22.

grains more than six drachms of chalk: these proportions apply to lemon juice of average strength; but its saturating power varies considerably with the state of the fruit; and when it has fermented, its saturating power remaining the same, its proportion of *citric* acid is often diminished.

Citric acid can only be manufactured economically upon a large scale, the principal waste accruing from the difficulty of obtaining the last portions of acid from the brown mother liquors. Upon this subject the reader may advantageously consult Mr. Parkes's Chemical Essays*.

Pure citric acid may be obtained in colourless crystals, the primary form of which appears to be a right rhombic prism, but subject to a variety of complex modifications. They are slightly deliquescent, and contain about 23.5 *per cent.* of water of crystallisation, of which only about 6 *per cent.* can be expelled by heat without decomposing the acid. The analysis of certain anhydrous compounds of citric acid affords the number 58 as its equivalent, and the crystals therefore may be regarded as containing—

1 proportional of Dry Acid.....	=	58
2 ——— Water ..... 9×2	=	18
		76

Like most other vegetable acids, the citric is a triple compound of oxygen, hydrogen, and carbon, but the proportions of these ultimate elements have not been ascertained with precision; at least the results of the best analysts differ widely from each other.

Assuming dry citrate of lime to be composed of 28 lime and 58 citric acid, its equivalent number will be 86; and 86 parts of dry citrate will require 49 of liquid sulphuric acid of the specific gravity 1.8 for their decomposition in the process for obtaining the pure acid: this is always necessarily diluted with a large proportion of water, to prevent the decomposition of a portion of the citric by the sulphuric acid, which otherwise would occur.

* Vol. i. p. 539, 2d edition.

Lemon juice and solution of citric acid are abundantly employed in medicine, chiefly in the preparation of cooling drinks, and saturated with potassa in saline draughts. Sometimes citrate of ammonia is used, which is probably somewhat more diaphoretic than citrate of potassa; but these compounds are very inert in themselves, though elegant vehicles for some of the more active diaphoretics and expectorants. The following are the ordinary prescriptions for saline draughts:—

℞ Potassæ Subcarbonatis ℈j.
Succi Limonum recentis f℥ss. vel q. s.
Aquæ f℥j.
Spirit. Myristicæ,
Syrupi Simplicis, āā f℥j. M.

℞ Ammoniæ Subcarbonatis ℈j.
Succi Limonum recent. f℥vj. vel q. s.
Misturæ Camphoræ f℥vj.
Syrup. Tolutani f℥ss. M.

Nausea and vomiting are sometimes relieved by the exhibition of a saline draught taken in the act of effervescence, or, in other words, by the effect of free carbonic acid upon the stomach: in this case, the following formula is used, in which carbonate (bicarbonate) of potassa is substituted for the subcarbonate (carbonate):—

℞ Potassæ Carbonatis gr. xxiv.
Aquæ f℥j.
Syrupi Cort. Aurant.,
Tinctur. Cardam. compos. āā f℥j.
M. fiat haustus in actu effervescentiæ sumendus cum Succi Limonum recentis f℥ss.

In these formulæ fresh lemon juice communicates a more agreeable flavour than solution of citric acid, but the latter may often be conveniently substituted, especially in the effervescing draught.

Twenty grains of carbonate of potassa are saturated by fifteen grains of crystallised citric acid; the same weight of

subcarbonate of potassa requires eighteen grains of the acid; and of subcarbonate of ammonia about twenty-six grains*.

Fresh lemon juice is a valuable remedy in the cure and prevention of sea scurvy, but it would appear from the extensive experience of Sir Gilbert Blane upon this subject, that the solution of the crystallised acid is not an adequate substitute. It deserves to be ascertained how far it might become so, by the addition of gum arabic, or other forms of vegetable mucilage, which is the only ingredient to which the superior efficacy of the fresh juice can be plausibly attributed.

Acidum Muriaticum.

℞ Sodæ Muriatis exsiccatæ libras duas,
Acidi sulphurici *pondere* uncias viginti,
Aquæ destillatæ octarium cum semisse;

Acidum cum Aquæ octario dimidio prius in retortâ vitreâ misce, et his, ubi refrixerint, Sodæ Muriatem adjice. Aquæ quod reliquum est in receptaculum infunde; tum, retortâ aptatâ, in hanc aquam transeat Acidum muriaticum destillatum ex balneo arenæ, calore gradatim aucto, donec retorta rubescat.

Acidi muriatici pondus specificum est ad Aquæ destillatæ pondus specificum, ut 1.160 ad 1.000.

Sodæ Subcarbonatis crystallorum grana 124 ab hujus acidi granis centum saturantur.

Muriatic Acid.

Take of dried Muriate of Soda, two pounds,
Sulphuric Acid, *by weight*, twenty ounces,
Distilled Water, a pint and a half;

First mix the acid with half a pint of the water in a glass retort; and when the mixture has cooled, add the Muriate of Soda; pour the remainder of the water into a receiver, and, having adapted the retort, let the muriatic Acid distil over into this water, from a sand-bath gradually heated to redness.

The specific gravity of muriatic Acid is to the specific gravity of distilled Water as 1.160 to 1.000.

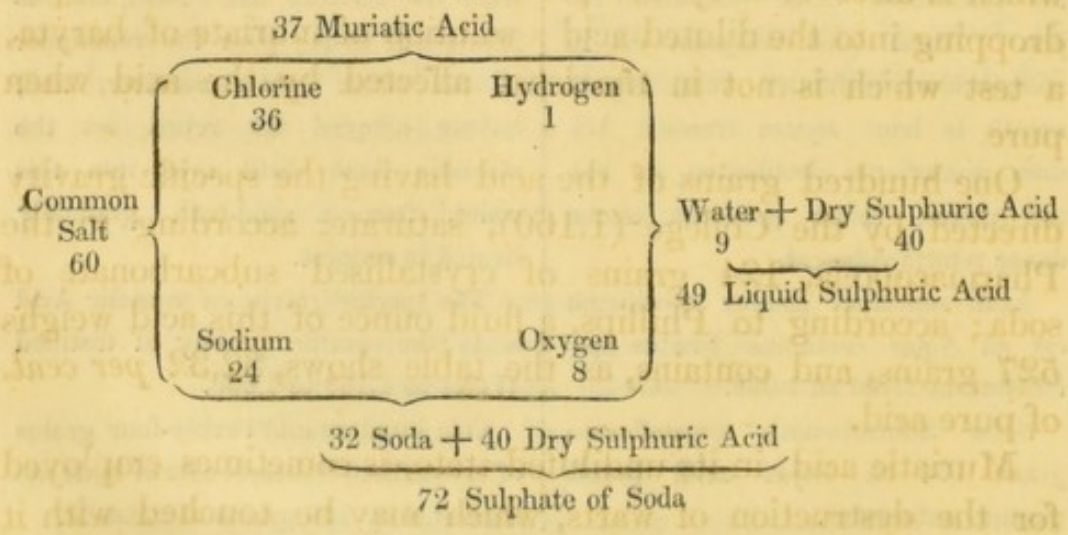
One hundred and twenty-four grains of crystallised Subcarbonate of Soda are saturated by 100 grains of this acid.

This process, originally given by Glauber, for the preparation of *spirit of salt* and *sal mirabile*, affords a solution of muriatic

* Phillips's Trans. p. 23.

acid in water. In its pure form the acid exists as a gas, of which water dissolves 480 times its volume; its specific gravity compared with common air, is as 1.298 to 1.000; it consists of equal volumes of hydrogen and chlorine, and is therefore properly called *hydrochloric acid*. The specific gravity of hydrogen to chlorine is as 1 to 36, and, accordingly, if these be assumed as the equivalents or representative numbers of those elements, muriatic will be represented by the number 37 or 1 + 36.

The discoveries of Sir H. Davy have taught us that common salt (improperly termed *muriate of soda*, since it neither contains muriatic acid nor soda) is a binary compound of chlorine and sodium in the proportions of 36 parts of the former to 24 of the latter. Sulphuric acid (see p. 11) is a compound of 40 parts of dry acid and 9 of water, which water is composed of 8 of oxygen and 1 of hydrogen; and when, in the above formula, sulphuric acid acts upon common salt, this portion of water is decomposed; its hydrogen combines with the chlorine to form muriatic acid, and its oxygen transferred to the sodium forms soda, which unites with the dry sulphuric acid to form sulphate of soda. These decompositions are further shown in the following table:—



In this table no notice is taken of the excess of water which is present, and which is employed in dissolving the muriatic acid, with which part of it distils over.

The specific gravity of a solution of muriatic acid is di-

rectly as the quantity of real acid which it contains; the following table, constructed by Mr. E. Davy, shows the quantity of real gaseous acid contained in the liquid acid of different specific gravities.

Specific Gravity.	100 grains contain of Muriatic Acid Gas.	Specific Gravity.	100 grains contain of Muriatic Acid Gas.
1.21	42.43	1.10	20.20
1.20	40.80	1.09	18.18
1.19	38.38	1.08	16.16
1.18	36.36	1.07	14.14
1.17	34.34	1.06	12.12
1.16	32.32	1.05	10.10
1.15	30.30	1.04	8.08
1.14	28.28	1.03	6.06
1.13	26.26	1.02	4.04
1.12	24.24	1.01	2.02
1.11	22.30		

Muriatic acid, carefully distilled according to the above directions, is a transparent colourless fluid, which gradually acquires a pale straw colour by keeping; but the acid, as it usually occurs in commerce, is of a yellow tint, derived from a little oxide of iron: it also often contains sulphuric acid, which is discovered by the production of a white cloud upon dropping into the diluted acid a solution of muriate of baryta, a test which is not in the least affected by the acid when pure.

One hundred grains of the acid having the specific gravity directed by the College (1.160), saturate, according to the Pharmacopœia, 124 grains of crystallised subcarbonate of soda; according to Phillips, a fluid ounce of this acid weighs 527 grains, and contains, as the table shows, 32.32 *per cent.* of pure acid.

Muriatic acid, in its undiluted state, is sometimes employed for the destruction of warts, which may be touched with it night and morning; strong acetic acid, however, is a more effectual and certain remedy, and never fails, when properly and regularly applied, to destroy those excrescences. In doses of from ten to thirty drops in two ounces of water, this acid is frequently used medicinally as a tonic refrigerant, and

in those cases of white sabulous deposit in the urine which depend upon excess of the phosphates: in such cases it is best given in barley water, moderately sweetened. As a tonic it may be combined with bitters, but it is not preferable to the dilute sulphuric acid, and is more apt to occasion purging. Paracelsus used muriatic acid in the cure of putrid fevers, and it is often a good remedy, especially in malignant sore throat, both internally and as a gargle.

℞ Acid. Muriatici f℥jss.
Decoct. Cinchonæ,
Infus. Rosæ compos. āā f℥iijss.
Mellis Rosæ f℥j.
M. fiat gargar.

In scorbutic ulceration of the gums, the following local application, conjoined with proper general treatment, has been found effective:—

℞ Acid Muriatici f℥j.
Mellis,
Aquæ Rosæ, āā f℥j.
M. fiat linctus ter vel quater die gingivis applicandus.

Muriatic acid gas being easily produced by pouring sulphuric acid upon common salt, is a ready and powerful agent in the destruction of infectious matter and hence very useful for fumigating the houses and apartments of persons suffering under contagious diseases. After the recovery or removal of such persons, the apartments which they have occupied should be thoroughly fumigated, either with muriatic acid gas or chlorine: the latter, though most effective, is dangerous from the violent cough and irritation of the lungs which it is apt to excite. In such cases also great care should be taken that the blankets, clothes, &c., of the sick person are thoroughly scoured and washed; the feather-beds too should be exposed to a heat of about 212° for some hours, by which any infection retained in them will be destroyed. The most common disease in this country, requiring precautions of this kind, is the scarlet fever.

Chlorine is easily generated for the purposes of fumigation

by mixing eight parts of common salt with three of powdered black oxide of manganese, and pouring upon this mixture four parts of sulphuric acid, previously diluted with four of water. These materials may be mixed in a large tea-cup and placed in a basin containing boiling water, the heat of which will cause the abundant evolution of chlorine. They should be placed in the middle of the room, which should be closed for forty-eight hours, and then duly ventilated; or, if the apartment is large, three or four cups, each containing six or eight ounces of the mixture, may be used.

Chlorine is not mentioned in our Pharmacopœia, but it has a place in most of the foreign Pharmacopœiæ, and its medical virtues are highly thought of by some practitioners in this country; it is, however, generally regarded as of very doubtful efficacy. It has been used internally in scarlet and typhus fever, in malignant sore throat, and in chronic affections of the liver; and externally as a lotion or bath, as an alterative, especially in the hepatic affections under which persons who have long resided in warm climates frequently suffer. Of the concentrated aqueous solution of chlorine, one drachm diluted with an ounce and a half of water may be taken as a dose, sweetened with sugar or capillaire; it cannot be conveniently administered with vegetable infusions. For its external application *nitro-muriatic acid* is generally resorted to, composed of two parts of muriatic and one of nitric acid; this should be so diluted as to taste as sour as strong vinegar, and should then be applied daily with a sponge to the surface of the body, or used as a bath for the feet and legs: it generally produces a slight cuticular excitement, thirst, and a peculiar taste in the mouth; the bowels become affected, the pulse quickened, and the pain in the region of the liver, the headach, and the symptoms of morbid irritability under which such patients frequently suffer, gradually give way. We owe this introduction of chlorine or nitro-muriatic baths to Dr. Scott, who long resided in India, and used them with great success. Upon the whole, however, the high encomiums at one time bestowed upon them seem not to be justified by further experience.

How far a diluted solution of chlorine might be usefully

applied to indolent and foul ulcers, and to correct the secretion of cancerous sores, deserves to be more fully investigated.

Acidum Nitricum. — *Nitric Acid.*

℞ Potassæ Nitratis exsiccatæ,
Acidi sulphurici, singulorum *pondere* libras duas;

Misce in retorte vitrea, tum balneo arenæ destillet Acidum nitricum, donec vapor ruber prodeat. Dein, adjectâ insuper Potassæ Nitratis exsiccatæ unciâ, iterum eodem modo Acidum destillet.

Acidi nitrici pondus specificum est ad pondus specificum Aquæ destillatæ, ut 1.500 ad 1.000.

Sodæ Subcarbonatis crystallorum grana 212 ab hujus Acidi granis centum saturantur.

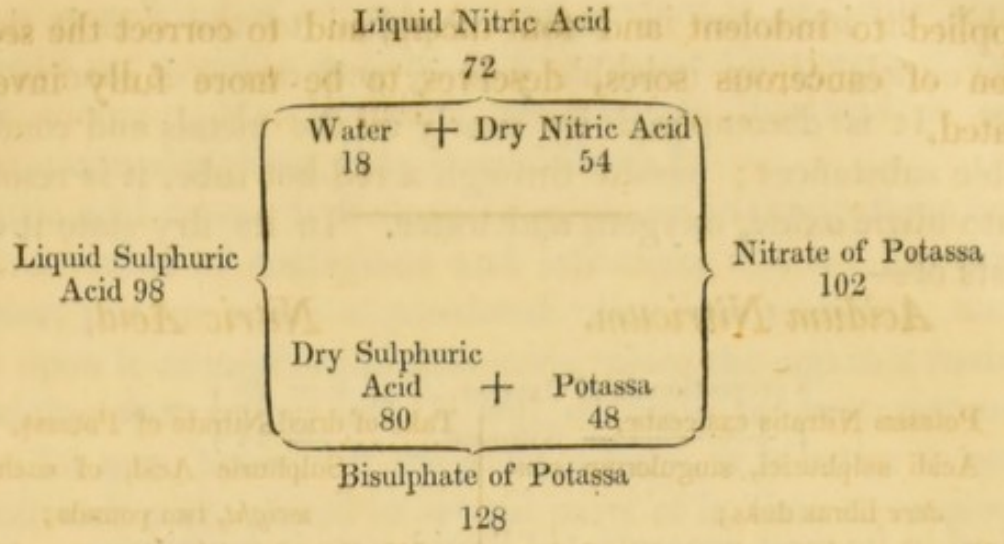
Take of dried Nitrate of Potassa,
Sulphuric Acid, of each, *by weight*, two pounds;

Mix them in a glass retort, and distil the nitric Acid from a sand-bath, until a red vapour arises: then having added to it one ounce of dry Nitrate of Potassa, let the acid be redistilled in a similar manner.

The specific gravity of nitric Acid is to the specific gravity of distilled Water, as 1.500 to 1.000.

212 grains of crystallised Subcarbonate of Soda are saturated by 100 grains of this Acid.

In this process the decomposition of the nitre gives rise to the production of nitric acid and bisulphate of potassa; and that these results may be obtained, it is necessary to distil the nitre with nearly its own weight of sulphuric acid, for if less sulphuric acid be employed, a portion of nitrous acid is formed. The requisite theoretical quantities of sulphuric acid and nitre are two proportionals of the former to one of the latter, or by weight $49 \times 2 = 98$ and 102. The two proportionals of water in the liquid sulphuric acid combine with one proportional of dry nitric acid in the nitre to constitute liquid nitric acid, and the two remaining proportionals of dry sulphuric acid combine with the potassa of the nitre to form bisulphate of potassa, as shown in this diagram:—



Liquid nitric acid, therefore, of the specific gravity 1.5, is a compound of one proportional of dry acid = 54, and two of water = 18, and its equivalent number is 72. Liquid sulphuric acid, on the contrary, is a compound of one proportional of dry acid = 40, and one of water = 9, its equivalent being 49. So that to furnish a due proportion of water for the formation of liquid nitric acid, two proportionals of liquid sulphuric acid ($49 \times 2 = 98$) are required.

The wholesale manufacturers of nitric acid generally employ a distillatory apparatus of earthenware, and use less sulphuric acid than the College directs. The acid vapour is condensed in receivers containing a portion of water, and the liquid acid is usually of a deep orange colour, from the presence of nitrous acid, which, however, may be expelled by heat, and the acid thus becomes colourless. In point of economy it seems doubtful whether the College process or that of the manufacturer, who uses little more than half the quantity of sulphuric acid, is to be preferred. Mr. Phillips observes, that although twenty-four ounces of nitre, distilled with an equal weight of sulphuric acid, ought, according to theory, to yield upwards of sixteen ounces of liquid nitric acid, he has never been able to procure more than fifteen ounces and six drachms; the deficiency arising from decomposition of nitric acid, and other unavoidable loss.

Nitric acid is a dense colourless liquid, extremely corrosive and caustic; it exhales fumes when exposed to air, absorbing moisture, and consequently diminishing in specific gravity,

while it increases in bulk. Applied to the skin it tinges the cuticle of an indelible yellow, and causes it soon to peel off. It is decomposed by nearly all the metals and combustible substances; passed through a red-hot tube, it is resolved into nitric oxide, oxygen, and water. In its dry state it consists of—

5 proportionals of Oxygen..8 × 5 = 40
1 ——————— Nitrogen.....= 14 } = 54

And in its most concentrated liquid state it contains—

1 proportional of dry Acid.....= 54
2 ——————— Water... 9 × 2 = 18 } = 72

When nitric and muriatic acid are mixed, a partial decomposition of both ensues, and, as Sir H. Davy first showed, chlorine and nitrous acid are the results, and a portion of water is formed by the union of the hydrogen of the muriatic acid with a part of the oxygen of the nitric.

The common nitric acid of commerce generally contains traces of sulphuric acid and of potassa, and a very notable proportion of muriatic acid, derived from common salt contained in the rough nitre employed for its production. A very dilute solution of nitrate of baryta is not affected by pure nitric acid, but it is rendered turbid by the presence of sulphuric acid. A dilute solution of nitrate of silver is not altered by pure nitric acid, but when it contains muriatic acid, a white cloud of chloride of silver is formed, which becomes brown by exposure to light. The presence of potassa or nitre, in nitric acid, may be learned by evaporation to dryness; the pure acid leaves no residue.

The medical uses of nitric acid are stated in the next article: it is scarcely ever employed in its concentrated state, although a very effectual caustic: in this respect it would probably be an efficacious application in the bite of a mad dog: its liquid form enabling it to penetrate into the wound, the surfaces of which would be thus killed and corroded, while its peculiar activity in the decomposition and destruction of

almost every kind of animal matter, renders it probable that it would act speedily and energetically upon the poison of the rabid animal. Mr. Welbank recommends this acid as an escharotic in sloughing phagedænic ulcers *.

Nitric acid vapour is frequently employed in fumigations for the destruction of contagious and infectious matter: for this purpose, put an ounce of powdered nitre into a tea-cup, and pour upon it as much sulphuric acid; place the cup in a basin containing hot water, and it will continue to emit nitrous fumes for some hours. If the room is large, it is better to use several such cups, placed in several parts of it, than to employ one larger one.

Acidum Nitricum Dilutum. — *Diluted Nitric Acid.*

℞ Acidi nitrici fluidunciam, Aquæ destillatæ fluiduncias novem; Misce.	Take of nitric acid, a fluid ounce, Distilled Water, nine fluid ounces; Mix.

Dilute nitric acid, of the above strength, may be given in doses of from ten to forty minims, in an ounce or two of any proper vehicle, such as capillaire and water, or infusion of roses, or in any of the common bitter infusions or decoctions; for although the concentrated acid is decomposed by the greater number of vegetable substances, the diluted acid may be mixed with them without any such effect. Nitric acid is considered as an antiseptic tonic, and is a good remedy in those cases of dyspepsia attended by general debility and nausea, in which the acid plan of treatment is indicated. It is said to have been useful in chronic hepatitis attended by dropsy; and was at one time considered as a powerful remedy in the cure of syphilis: although in such cases it may be occasionally efficacious as a tonic, it is by no means to be regarded as possessing any distinct influence over the disease,

* Med. Chir. Trans. vol. xi. p. 369.

corresponding with that of mercury. In some cases of eruptions, and in ulcerations of the legs, an alterative course of medicine, consisting of nitric acid and small doses of mercury, has been found of service: the acid may be given in the morning and at noon, and five grains of mercurial pill may be taken at bed-time: the bowels will generally be opened, and sometimes violently affected by this treatment, but these effects may be quelled by opiates. It is very doubtful whether nitric acid is preferable to the other mineral acids as an antiseptic and refrigerant, though it has sometimes been supposed to operate in some peculiar manner by imparting oxygen to the system: no experience, however, justifies such an opinion.

As nitric acid dissolves uric acid as well as the phosphates, chemical physicians have sometimes preferred it as a lithontriptic, and have considered it especially applicable in those cases in which the sand voided is composed of a mixture of those substances: but practice does not sanction such a theory; and where the urine deposits, as it sometimes obstinately does, a sediment consisting of variable proportions of the phosphates and of uric acid, it is usually symptomatic of disordered digestion or of some hepatic affection, and yields to acids with bitters and mild aperients. If, however, the sediment assumes the more decided appearance and symptoms of *gravel*, and is attended with pain in the region of the kidneys, and appears in the urine when voided, and not merely as a sediment during its cooling, then it is right to encounter the uric matter with carbonated alkalies, which will generally entirely change the sediments into the phosphates, and these will disappear under the use of tonics, or of a subsequent course of mild acids if necessary.

Nitric acid is applied externally to ill-conditioned sores or ulcers, in various states of dilution, depending upon the effects it produces, which are sometimes very beneficial; two or three drachms of the diluted acid to a pint of water may be used in the first instance, and the strength increased according to circumstances *.

The specific gravity of the diluted acid, as prescribed in

* See Home on Ulcers, 1801, p. 216.

the formula at the head of this article, is 1.080. According to Mr. Phillips, 100 grains contain 14.3 of concentrated acid, and saturate about thirty grains and one-third of crystallised subcarbonate of soda, so that their respective strengths *by weight* are to each other as 1 to 7.

Acidum Sulphuricum Dilutum. — *Diluted Sulphuric Acid.*

R Acidi sulphurici, fluidunciam cum semisse,	Take of sulphuric Acid, a fluid ounce and a half,
Aquæ destillatæ fluiduncias quatuordecim cum semisse;	Distilled Water, fourteen fluid ounces and a half;
Acidum Aquæ paulatim adjice; tum misce.	Add the Acid gradually to the Water, and mix.

This formula furnishes the acid in a convenient state of dilution for medical use: one fluid drachm contains ten grains of the concentrated acid, specific gravity 1.8. It may be given in doses of from ten to thirty or forty minims, and is a very useful tonic: it is also generally considered as astringent, and therefore preferred to the other acids where there is tendency to diarrhœa, to hæmorrhage, or to excessive diaphoresis. The greater number of bitter and astringent vegetable infusions are good vehicles for this acid, especially the compound infusion of roses and of gentian, or a mixture of the two: where the bowels are torpid, sulphate of magnesia may be conjoined with the acid draught; and where it gripes and relaxes, aromatics and small doses of opium may be added. A draught composed of an ounce and a half of compound infusion of roses, and twenty minims of dilute sulphuric acid, is a good vehicle for tincture of opium, where the latter nauseates when given without the acid.

This acid has been used in very large doses in malignant erysipelas with a tendency to hæmorrhage, and also in vio-

lent uterine hæmorrhages. In such cases an ounce has been given in the course of twenty-four hours *.

In diluting the concentrated sulphuric acid of commerce, a small portion of sulphate of lead sometimes separates, rendering the mixture of acid and water at first milky, and afterwards falling in the form of a white sediment; this, where it occurs, should be carefully separated by decantation.

Acidum Tartaricum.

℞ Potassæ Supertartratis libras duas cum semisse,
Aquæ destillatæ ferventis congios tres,
Cretæ preparatæ libram,
Acidi sulphurici libram;

Potassæ Supertartratem coque cum Aquæ destillatæ congiis duobus, et adjice paulatim Cretam præparatam, donec bullulæ non ampliùs excitentur: sepone ut subsidat Calcis Tartras: liquorum effunde, et Tartratem Calcis Aquâ destillatâ sæpiùs ablue, donec saporis expers sit. Tum superinfunde Acidum sulphuricum Aquæ destillatæ ferventis congio dilutum, et sepone per horas viginti quatuor subindè agitans. Liquorem cola, et balneo aquoso consume ut fiant crystalli.

Tartaric Acid.

Take of Supertartrate of Potassa, two pounds and a half,
Boiling distilled water, three gallons,
Prepared Chalk, a pound,
Sulphuric Acid, a pound;

Boil the Supertartrate of Potassa with two gallons of the distilled Water, and add the prepared Chalk by degrees, until it ceases to cause effervescence. Set by the mixture, that the Tartrate of Lime may subside; pour off the liquor and wash the tartrate of lime frequently with distilled Water until it becomes tasteless. Then pour upon it the sulphuric Acid diluted with a gallon of boiling distilled Water, and set them by for twenty-four hours, occasionally stirring them. Strain the liquor, and then evaporate it by a water-bath, so that crystals may form.

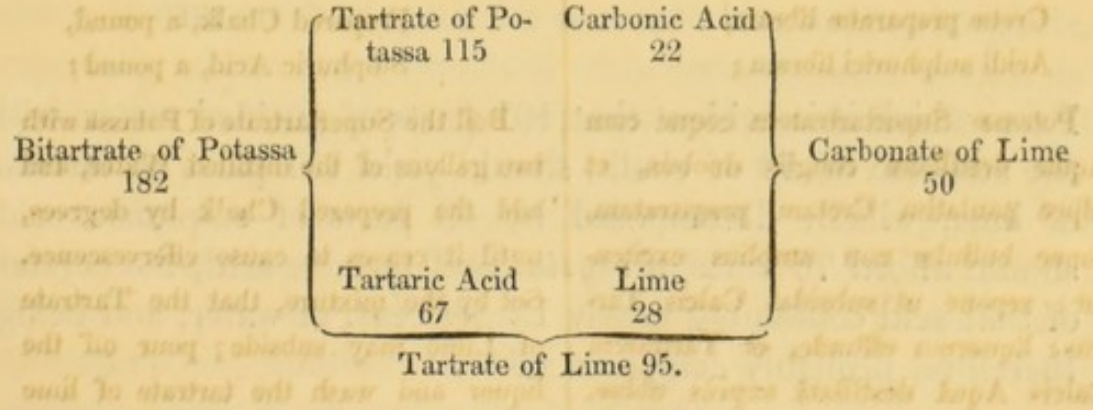
Supertartrate or bitartrate of potassa is a compound of one proportional of potassa with two of tartaric acid (see p. 142). In the above process one proportional of the tartaric acid unites with one of lime (contained in the carbonate of lime or

* Thomson, Lond. Disp. p. 583.

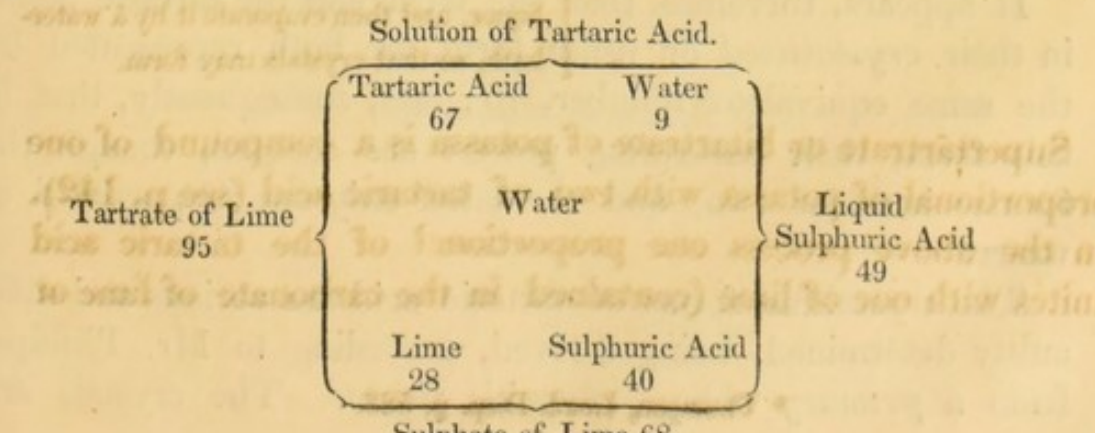
chalk), hence carbonic acid is expelled, and an insoluble tartrate of lime is formed, composed of—

1 proportional of Lime	28
1 ——————— Tartaric Acid	67
	95

This compound is decomposed by the sulphuric acid, which, uniting to the lime, forms sulphate of lime, and the tartaric acid is set free. This decomposition of the tartrate of lime corresponds with that of the citrate of lime, described under the head "Citric Acid;" and in the evaporations and crystallisations the same precautions are requisite. The actual weights of materials and products required for, and formed in, this process, are shown in the following tables, which also exhibit the changes of composition that take place:—



The carbonic acid is suffered to escape, and the tartrate of potassa is not directed in the Pharmacopœia to be obtained by evaporating its solution after the separation of the tartrate of lime; the decomposition of the latter by the sulphuric acid is as follows:—



In the above tables the bitartrate of potassa and the tartrate of lime are considered as anhydrous salts; but, according to Berzelius, the former contains between 4 and 5 and the latter between 27 and 28 *per cent.* of water, in their usual states of dryness. Crystallised bitartrate of potassa may, therefore, (upon this authority,) be regarded as a compound of—

1 proportional of dry Bitartrate of Potassa	182
1 ——————— Water.....	9
	191

And tartrate of lime, dried at a gentle heat, will consist of—

1 proportional of dry Tartrate of Lime	95
4 ——————— Water.....9 × 4 =	36
	131

From which it is evident that 191 parts of purified tartar, with the addition of 50 of chalk, should yield 131 parts of tartrate of lime, which, decomposed by 49 parts of sulphuric acid, should afford 76 parts of *crystallised* tartaric acid, the crystals of that acid containing nearly 12 *per cent.* of water, and being, therefore, probably composed of—

1 proportional of dry Acid.....	67
1 ——————— Water.....	9
	76

It appears, therefore, that the citric and the tartaric acids, in their *crystallised* or usual form, are both represented by the same equivalent number, 76; and, consequently, that, in this form, their saturating powers are coequal, though the former includes two, and the latter only one proportional of water.

The crystalline forms of tartaric acid are various and difficultly determined, being derived, according to Mr. Phillips, from a *primary* oblique rhombic prism. The crystals are

permanent in the air, and require for their solution about six parts of water at 60°. Like the other vegetable acid solutions, this becomes mouldy when kept; and its ultimate elements, carbon, oxygen, and hydrogen, form other secondary compounds.

Tartaric acid may be used as a substitute for citric acid, in the formation of refrigerant drinks; and, as it does not deliquesce by exposure to air, it is generally employed in the preparation of effervescent powders, used as substitutes for soda water. For this purpose, the tartaric acid should be powdered, and dried in a gentle heat; it should then be mixed in proper proportion with powdered bicarbonate of potassa or of soda, and kept in well-corked phials; a tea-spoonful stirred into a small tumbler of cold water, affords a pleasant effervescent draught, and is a good vehicle for sulphate of magnesia, potassa-tartrate of soda, or other saline aperients. These effervescing draughts are often effectual in removing a tendency in the urine to deposit the ammonio-magnesian phosphate, especially where water saturated with carbonic acid cannot be procured: in such cases the tartaric acid should be in slight excess.

Seventy-six parts of crystallised tartaric acid saturate 70 of dry subcarbonate, and 101 of crystallised carbonate (bicarbonate) of potassa, and 153 parts of *crystallised* subcarbonate of soda; these numbers bearing the same relation to each other as those above given under the head "Citric Acid."

According to Hermbstadt, tartaric acid may be economically manufactured from the juice of sour grapes, thirty-six ounces of which afford about two ounces and a half of the acid.

ALKALIES AND THEIR SALTS.

PREPARATIONS OF AMMONIA.

Ammoniæ Subcarbonas. *Subcarbonate of Ammonia.*

℞ Ammoniæ Muriatis libram,
Cretæ Preparatæ exsiccatæ libram cum semisse;

Separatim in pulverem tere; tum misce, et sublima calore paulatim aucto, donec retorta rubescat.

Take of Muriate of Ammonia a pound,
Prepared Chalk, dried, a pound and a half;

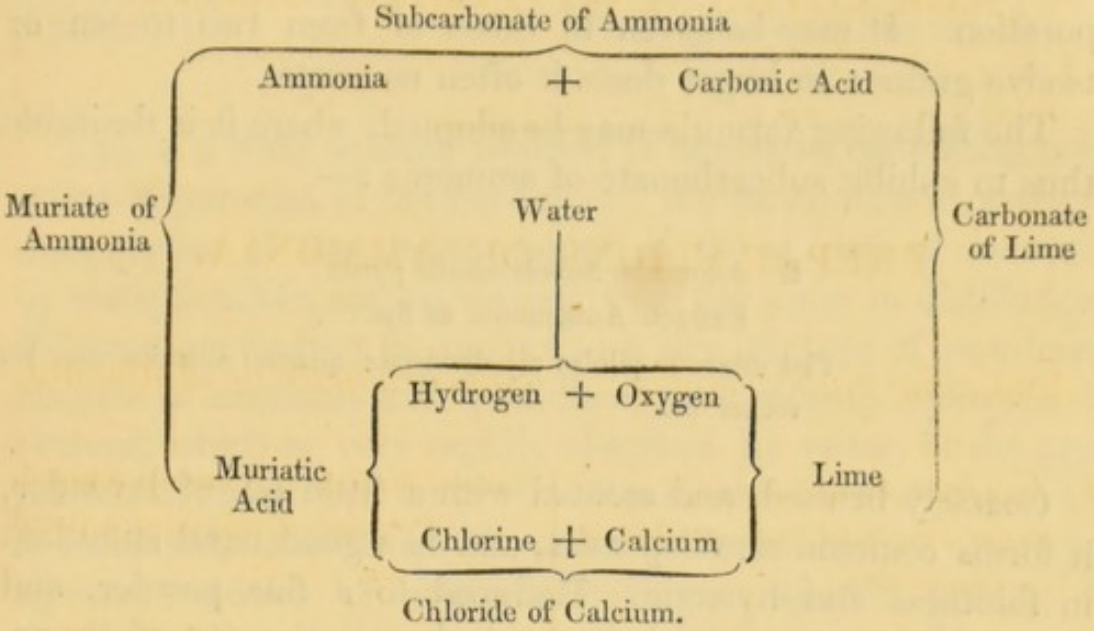
Reduce them separately to powder; then mix them, and sublime by raising the heat gradually till the retort becomes red.

In the above process, muriate of ammonia is decomposed by carbonate of lime, and a compound of carbonic acid, ammonia, and water is obtained, which may be termed *hydrated sesquicarbonate of ammonia;* for it consists of 1 proportional of ammonia, 1½ of carbonic acid, and 1 of water: or if we double these numbers, to avoid the fraction, its composition will stand thus:—

2 proportionals of Ammonia	17 × 2	= 34
3 ——————— Carbonic Acid...	22 × 3	= 66
2 ——————— Water.....	9 × 2	= 18
		118

Such appears, from the experiments of Mr. R. Phillips, to be the nature of the compound which is here called "Subcarbonate of Ammonia." In its formation, the carbonic acid is derived from the chalk, and the ammonia from the muriate,

the water being formed at the expense of the oxygen of the lime and the hydrogen of the muriatic acid; the residue in the retort being chloride of calcium, as shewn in the following diagram :—



This salt is prepared on the large scale by the wholesale manufacturer, and occurs in the market cheap and pure. Large quantities are also made from the products of the distillation of coal in gas works: this, however, is rarely pure, having a slight odour of coal tar, and depositing a blackish carbonaceous matter when dissolved in acids.

It is generally met with in hardish translucent masses, of a striated appearance: it has a pungent odour, a sharp urinous taste, and acts upon vegetable colours in the manner of an alkali. It should be kept in well-stopped bottles, for when exposed to air it gradually loses ammonia, becomes opaque, pulverulent, and less pungent, and ultimately passes into a *hydrated bicarbonate of ammonia*, composed of—

1 proportional of Ammonia		17
2 ——— Carbonic Acid ...	22×2	= 44
2 ——— Water.....	9×2	= 18
		79

Subcarbonate of ammonia is an excellent antacid, and nervous stimulant, useful in the same cases as the *liquor ammoniæ*. It is generally administered in solution, and frequently with aromatics, as in the *spiritus ammoniæ compositus*, but its solid form renders it a proper ingredient in pills; and when mixed with extracts, it does not very readily make its escape by evaporation. It may be given in doses of from two to ten or twelve grains: in larger doses it often nauseates.

The following formula may be adopted, where it is desirable thus to exhibit subcarbonate of ammonia:—

℞ Ammoniæ Subcarbonatis pulver.
Extracti Anthemidis, ää ʒss.
Fiat massa in pilulas xij. dividenda, quarum sumatur una bis vel ter die.

Coarsely bruised, and scented with a little oil of lavender, it forms common *smelling salts*, and is a good nasal stimulant in faintness and hysteria. Reduced to a fine powder, and mixed with spermaceti ointment, it is sometimes usefully applied as a rubefacient, and it may also be employed as an adjunct to opiates and other anodyne plasters for rheumatic and anomalous muscular pains. One part of powdered subcarbonate of ammonia, mixed with three of extract of belladonna, and applied in the form of a plaster, is very effectual in allaying rheumatic and spasmodic pains.

Liquor Ammoniæ.

℞ Ammoniæ Muriatis uncias octo,
Calcis recentis uncias sex,
Aquæ octarios quatuor;

Calci superinfunde Aquæ octarium; tum vas contege et sepone per horam; dein Ammoniæ Muriatem et reliquam Aquam priùs fervefactam adjice, et vas iterum contege; liquorem postquam refrixerit cola;

Solution of Ammonia.

Take of Muriate of Ammonia, eigh ounces,
Fresh Lime, six ounces,
Water, four pints;

Pour a pint of the Water upon the Lime, and set them by, for an hour, in a covered vessel; then add the Muriate of Ammonia and the rest of the Water, previously heated, and again cover the vessel. After the

tum destillent Liquoris Ammoniæ fluiduncias duodecim in receptaculum cujus calor gradum 50^{mum} non superet.

Liquoris Ammoniæ pondus specificum est ad pondus Aquæ destillatæ ut 0.960 ad 1.000.

liquor has become cold, strain it; and let twelve fluid ounces of Solution of Ammonia be distilled from it into a receiver, cooled to a temperature not exceeding 50°.

The specific gravity of Solution of Ammonia is to the specific gravity of distilled Water as 0.960 to 1.000.

This is a weak aqueous solution of ammonia, containing only about 10 *per cent.* of the pure alkali: the ammonia is evolved, in consequence of the decomposition of the muriate of ammonia by the quicklime, and passes over with the water in distillation. When a gentle heat is applied to a dry mixture of powdered muriate of ammonia and quicklime, pure gaseous ammonia is evolved, which is very rapidly absorbed by water, in the proportion of about 480 times its volume: the bulk of the water is increased, and its specific gravity diminished, a saturated aqueous solution of ammonia having a specific gravity of 0.875 at 50°; so that the strength of liquid ammonia may be said to be inversely as its specific gravity.

The following table, drawn up by Sir H. Davy*, will often be found of use to the pharmaceutical chemist: it shews the weight of pure ammonia contained in 100 parts of the solution, at different specific gravities:—

100 parts of Sp. Gr.		Of Ammonia	100 parts of Sp. Gr.		Of Ammonia
.8750	contain	32.50	.9435	contain	14.53
.8875		29.25	.9476		13.46
.9000		26.00	.9513		12.40
.9054		25.37	.9545		11.56
.9166		22.07	.9573		10.82
.9255		19.54	.9597		10.17
.9326		17.52	.9619		9.60
.9385		15.88	.9692		9.50

Ammonia is a compound of hydrogen and nitrogen, in the proportions of three parts of the former to fourteen of the latter: its equivalent number is 17.

* Elements of Chemical Philosophy, p. 268.

In medicine, *liquor ammoniæ* is employed as a powerful stimulus: internally it may be given in doses of from half a drachm to a drachm, considerably diluted, and is useful as a nervous stimulant in certain paralytic affections, and in those cases of indistinct vision and noise in the ears to which nervous persons are subject, and which sometimes appear connected with debilitated digestive powers. Faintness and giddiness are also frequently immediately relieved by a due dose of ammonia; and in heartburn and acidity in the stomach and *primæ viæ*, it is effective, not merely as a stimulant, but also as neutralising the irritating acid matter. In such cases it may be conveniently given with small doses of bitters, and occasionally with a little magnesia, as in the following formula: in all these cases, however, preparations of carbonate of ammonia are usually substituted for the pure alkali:—

℞ Liquoris Ammoniæ,
Tinctur. Cardam. compos.
Tinctur. Gentianæ compos. āā f ℥ss.
Mistur. Camphoræ f ℥iss.
M. fiat haustus.

In pyrosis or water-brash, ammonia with small doses of opium is of service, and in a variety of spasmodic disorders similar combinations, with ether, may be resorted to; they also prove diaphoretic.

As a nasal stimulant, liquid ammonia is used for the relief of headach, faintness, and vertigo: a piece of rag moistened with it, and applied to the region of the stomach in cases of spasmodic pains of that viscus; to the throat externally, in the varieties of inflammatory sore throat; or to the joints in rheumatic affections, is a remedy often useful: but in such cases combinations of ammonia with oily substances are usually to be preferred.

Liquor Ammoniæ Acetatis. *Solution of Acetate of Ammonia.*

℞ Ammoniæ Subcarbonatis uncias duas,	Take of Subcarbonate of Ammonia two ounces,

Acidi Acetici diluti octarios quatuor, vel quantum satis sit;	Diluted Acetic Acid, four pints; or a sufficient quantity;
Ammoniæ Subcarbonati adjice Acidum, donec bullulæ non ampliùs excitentur, et misce.	Add the Acid to the Subcarbonate of Ammonia until it ceases to excite effervescence, and mix.

Four pints of distilled vinegar of the usual strength (specific gravity 1.009) require about seven drachms of the recently prepared subcarbonate of ammonia of the Pharmacopœia for their saturation; but the strength of the distilled vinegar and the composition of the subcarbonate are both liable to vary, so that the best method of proceeding consists in adding the subcarbonate to the distilled vinegar, till the tests of turmeric and litmus shew that it is neutralised. The solution thus prepared is generally of a brownish tint, but it may be rendered colourless and pellucid by filtering it through a little well burned and recently powdered charcoal. If at first exactly neutral, it is apt to become slightly alkaline by keeping, in consequence of the escape of a little carbonic acid.

Acetate of ammonia is very difficult of crystallisation, and extremely soluble both in alcohol and water. In its dry state it should consist, according to theory, of—

1 proportional of Acetic Acid	.....	= 50
1 ——— Ammonia	.....	= 17
		67

The solution of this salt, as above directed, has long been used in medicine under the name of *spirit of Mindererus*, as a diaphoretic febrifuge, and though in itself not very active, it is usefully conjoined with other diaphoretics. The dose of the above solution is from half an ounce to an ounce, in conjunction with syrup of poppies, spirit of sulphuric ether, compound powder of ipecacuanha, antimonials, &c. The following is a good night-draught for allay-

ing the restlessness and irritation that often attends a common catarrh :—

℞ Liq. Ammoniæ Acetatis,
Mistur. Camphoræ, āā f℥vj.
Syrup. Papaveris f℥j.
Vini Antimon. Tart. min. xx.
M. ft. haustus hor. s. s.

Liquor ammoniæ acetatis is also used externally, as a discutient and stimulant; it is an excellent application in common cases of mumps; it should be applied hot upon a flannel. As a collyrium in opacity of the cornea, Boerhaave long ago recommended it diluted with its bulk of water and dropped into the eye. In chronic ophthalmia the following is a useful application :—

℞ Liq. Ammon. Acet. f℥ss.
Aquæ Rosæ f℥iijss.
Tinctur. Opii f℥j.
M. ft. collyr.

Mr. A. T. Thomson recommends it as a lotion in porrigo affecting the scalp.

Like many other diaphoretics, if its operation be not aided by external warmth, it is apt to act by the kidneys, and, in some cases, it proves considerably diuretic.

Liquor Ammoniæ Subcarbonatis.

℞ Ammoniæ Subcarbonatis uncias quatuor,
Aquæ destillatæ octarium;
Liqua Ammoniæ Subcarbonatem in Aquâ, et per chartam cola.

Solution of Subcarbonate of Ammonia.

Take of Subcarbonate of Ammonia, four ounces,
Distilled Water, a pint;
Dissolve the Subcarbonate of Ammonia in the Water, and filter through paper.

Subcarbonate of ammonia requires about four times its weight of cold water for solution, so that the above is a

saturated solution of the salt; it is better, however, to direct the solution to be made at the time it is required for use, than to rely upon the strength of that which has been long prepared; the above formula might indeed have been omitted without any inconvenience.

PREPARATIONS OF POTASSA.

Liquor Potassæ.

℞ Potassæ Subcarbonatis libram,

Calcis recentis libram dimidiam,
Aquæ destillatæ ferventis congium;

Liqua Potassam in Aquæ octariis duobus. Calci adjice Aquæ quod reliquum est. Liquores calentes inter se misce; tum sepone in vase clauso, et, postquam refrixerint, per pannum gossipinum cola.

Si Acidum dilutum quodlibet instillatum bullulas excitet, plus Calcis adjicere oportebit, et iterum colare.

Hujus Liquoris octarius pendere debet uncias sedecim.

Solution of Potassa.

Take of Subcarbonate of Potassa, a pound,
Fresh Lime, half a pound,
Boiling distilled Water, a gallon;

Dissolve the Subcarbonate of Potassa in two pints of the Water. Add the remaining Water to the Lime. Mix the hot liquors together; then set the mixture by in a covered vessel, and after it has cooled, filter the solution through a cotton strainer.

If effervescence be excited by dropping any diluted acid into the solution, more Lime must be added, and the solution again strained.

A pint of this Solution ought to weigh sixteen ounces.

In this process the lime becomes converted into carbonate of lime at the expense of the carbonic acid of the subcarbonate of potassa, and an aqueous solution of pure potassa is obtained; the insoluble carbonate of lime is rejected. The "Liquor Potassæ" thus procured, is sufficiently pure for the purposes for which it is required in medicine and pharmacy; but it always retains a little carbonic acid, and minute portions of other foreign substances. When the pint measure weighs sixteen ounces troy, the specific gravity is 1.056.

Liquor Potassæ should be clear and colourless; its taste is acrid, and it rapidly destroys the texture of the greater number of animal and vegetable substances. It changes most of the vegetable blues to green, and the yellows to brown: it dissolves gums, resins, and extractive matters, and readily combines with fats and oils, rendering them soluble in water; it is, therefore, powerfully detergent.

In doses of from ten to forty or fifty drops, this solution of potassa is used as an antacid, and as a lithontriptic in cases of uric diathesis; in all these cases, however, the subcarbonate of potassa is usually to be preferred. There are many cutaneous disorders which appear to arise from the presence of acid matter in the stomach and *primæ viæ*, and these are often relieved or cured by the administration of this remedy; but here also the subcarbonate is equally effectual, and less liable to disagree and nauseate: subcarbonate of magnesia is perhaps, in such cases, preferable to either. As uric acid is soluble in caustic, but not in carbonated potassa, the former has on that account been regarded as the most chemical and effectual remedy in cases of red gravel; but this reasoning is inapplicable, since the potassa can never reach the kidneys in its caustic state: indeed, the beneficial effects of alkaline remedies do not depend upon direct or actual *solvent power*, but upon some more recondite effect produced upon the *primæ viæ*, by which the secretion of excess of uric acid is indirectly obviated. There are instances in which *liquor potassæ* seems more effective than any other alkaline remedy in the cure of uric sand, so that it should not be rejected as a lithontriptic: in such cases, from ten to twenty or thirty drops may be given thrice daily in milk, or in sweetened barley-water; or if the case require it, in any proper bitter infusion, such as cold chamomile tea, or compound infusion of gentian.

Large doses of caustic potassa have been tried without success in *tic douloureux*.

Diluted solution of potassa, in the proportion, for instance, of two drachms of *liquor potassæ* to eight ounces of rose water, is a celebrated remedy for the prevention of venereal contagion. Soap and water, however, is equally effective, and less liable to be misused.

Liquor Potassæ Subcarbonatis.

℞ Potassæ Subcarbonatis libram,

Aquæ destillatæ fluiduncias duodecim;

Liqua Potassæ Subcarbonatem in Aquâ, et per chartam cola.

Solution of Subcarbonate of Potassa.

Take of Subcarbonate of Potassa, a pound,

Distilled Water, twelve fluid ounces.

Dissolve the Subcarbonate of Potassa in the Water, and filter the solution through paper.

This is a convenient form of subcarbonate of potassa for internal administration, but it has been almost superseded by the carbonate of potassa, in consequence of its nauseous flavour. From ten minims to a drachm may be given for a dose, as an antacid and lithontriptic, and barley-water is a good vehicle for it: it is also used in the preparation of extemporaneous soaps, as in the following formula, which is often effectual in allaying uric irritation:—

℞ Olei Amygdalæ f3j.
Liquor. Potassæ Subcarbon. f3ss.
Aquæ Menthæ,
— Destillat. āā f3vj.
M. ft. haustus bis die sumendus.

Where a course of alkaline remedies is rendered necessary by the excess of uric acid in the urine, the carbonates of soda will generally be found preferable to those of potassa; but there are cases in which the latter are most effectual, and in which a decided advantage is gained by substituting potassa for soda, so that the circumstance of a patient having used soda without much benefit should not always prevent the trial of potassa.

Potassa cum Calce.

℞ Liquoris Potassæ octarios tres,

Calcis recentis libram;

Potassa with Lime.

Take of Solution of Potassa, three pints,

Fresh Lime, a pound;

Decoque Liquorem Potassæ ad octarium ; dein adjice Calcem, affusâ aquâ resolutam, et diligenter misce.

Boil down the Solution of Potassa to one pint, then add the Lime previously slaked by the addition of water, and mix them thoroughly together.

Pure Potassa is a very unmanageable escharotic, in consequence of the facility with which it deliquesces, and the object of the above formula is to obviate this, and probably, at the same time, to render it milder in its operation: the "potassa cum calce" is, however, a very inconvenient application, and one which is rarely employed. It should be preserved out of the contact of air.

Potassa Fusa. — *Fused Potassa.*

℞ Liquoris Potassæ congium ;

Aquam in vase ferreo nitido ad ignem consume, donec, ebullitione finitâ, Potassa liquefiat: hanc super laminam ferream effunde in formas idoneas.

Take of Solution of Potassa, a gallon ;

Evaporate the Water in a clean iron vessel over the fire, until the ebullition ceases, and the Potassa liquefies; pour it out upon an iron plate, in pieces of proper forms.

The most convenient form of this preparation is that of cylinders or sticks, and thus it is usually found in commerce, having been cast in proper moulds. As above obtained, *potassa fusa* is an impure hydrated oxide of potassium. It may be to a great extent purified by digesting it in alcohol, pouring off the alcoholic solution from the remaining insoluble impurities, evaporating it to dryness, and afterwards fusing the residue at a red heat in a crucible or basin of pure silver. It is then obtained in the form of a grey brittle substance, composed of—

1 proportional of Potassium	=	40.	70.2
1 ———— Oxygen	=	8.	14.0
1 ———— Water	=	9.	15.8
		57	100

The number 48, therefore, is the equivalent of dry protoxide of potassium. There is also a peroxide of potassium composed of—

1 proportional of Potassium.....		= 40
3 ———— Oxygen.....	8 × 3	= 24
		64

which, when put into water, loses oxygen, and reverts to the state of protoxide; a portion of this peroxide is generally contained in the fused potassa of commerce, which, in that state, evolves oxygen when put into water.

Fused potassa is commonly of a dingy grey or green colour. Exposed to air it absorbs water and carbonic acid, and rapidly deliquesces. It is soluble in about its own weight of water. It is extremely corrosive, and when applied to the skin or flesh, it kills the part and then combines with it, forming a kind of soapy compound; hence its employment in surgery as a powerful caustic.

For internal use it is prescribed in solution under the more convenient form of *liquor potassæ*.

Potassæ Acetas.

℞ Potassæ Subcarbonatis libram,

Acidi Acetici fortioris octarios duos,

Aquæ destillatæ ferventis octarios duos;

Acidum cum Aquâ priùs commixtum Potassæ Subcarbonati adjice, donec bullulæ non ampliùs excitentur, et cola. Liquorem primò in balneo aquoso consume donec cessaverit ebullitio. Dein calori gradatim aucto expone, et iterum consume donec pellicula supernatet; pelli-

Acetate of Potassa.

Take of Subcarbonate of Potassa, a pound,

Strong Acetic Acid, two pints,

Boiling distilled Water, two pints;

Having first mixed the Acid and Water, add it to the Subcarbonate of Potassa, till it ceases to excite effervescence, and filter; evaporate the liquor in a water-bath until ebullition ceases. Then expose it to a heat gradually increased, and again evaporate until a pellicle appears on the sur-

culam ablatam super chartam bibulam exsicca. Iterum et sæpiùs consumatur liquor, et pelliculam eodem modo aufer et exsicca.

face; remove this pellicle, and dry it on bibulous paper. Continue the evaporation of the liquor, and remove and dry the pellicles in the same manner.

This is the *arcanum tartari*, *sal diureticum*, *tartarus regeneratus*, and *sal essentiale vini*, of the older pharmaceutical writers. There is some difficulty in obtaining acetate of potassa white, and the variations in the formulæ of the different Pharmacopœiæ seem chiefly directed to this object. In the above process the alkaline carbonate is decomposed by the acetic acid, and the solution of the acetate thus obtained carefully evaporated till pellicles begin to form upon it; these swell up, and may be conveniently removed by a skimmer, and dried in a moderate heat upon bibulous paper. The salt thus procured is white, and in the form of light spongy masses.

As it generally occurs in commerce, it is flaky or lamellar, having been fused and slowly cooled; hence the term *terra foliata tartari* formerly applied to it. It has a pungent saline taste, diffusing a peculiar warmth over the palate; is uncrystallisable, deliquescent, and very soluble in water and alcohol; the former taking up its own weight, and the latter about half its weight of the foliated salt. By exposure to a red heat it is resolved into carbonate of potassa, in consequence of the decomposition of the acetic acid at that temperature. It consists of—

1 proportional of Acetic Acid	50	51
1 ——— Potassa	48	49
	98	100

This is an unimportant article, and as it is always administered in solution, it might have been left to extemporaneous prescription. Without adjuncts it is not effective as a diuretic; as a diaphoretic it ranks with citrate of potassa. It is given in doses of from twenty to sixty grains, generally dissolved in some of the aromatic distilled waters or bitter infusions, and as an assistant to diuretics, as in the following

formula. In doses of four to six drachms, it is said to be aperient, but as such it is never administered:—

℞ Potassæ Acetatis ℥ss.
Infusi Quassiæ,
Aq. Cinnamomi, āā f℥vj.
Aceti Scillæ,
Spiritûs Ætheris Nitrici, āā f℥ss.
M. fiat haustus ter in die capiendus.

Potassæ Carbonas.

℞ Liquoris Potassæ Subcarbonatis congium;

Acidum carbonicum per Liquorem Potassæ subcarbonatis in vase idoneo transmitte ad plenam saturationem, et cola. Vaporet liquor colatus ut fiant crystalli, cavendo ne calor gradum 120^{mum} excedat. Has, effuso liquore, super chartam bibulam exsicca.

Acidum carbonicum facillimè obtinetur e Marmore albo et Acido sulphurico diluto.

Carbonate of Potassa.

Take of Solution of Subcarbonate of Potassa, a gallon;

Put the Solution of Subcarbonate of Potassa into a convenient vessel; pass a current of carbonic acid through it until it is completely saturated, and strain it. Let the strained solution be evaporated, so that crystals may form, taking care that its temperature does not exceed 120°. Having poured off the solution, dry the crystals on bibulous paper.

Carbonic Acid may be easily obtained from white marble and diluted sulphuric Acid.

These directions for the preparation of carbonate of potassa (properly *bicarbonate*) are a considerable improvement upon the process of the former Pharmacopœia, in which the carbonic acid was inconveniently and expensively derived from carbonate of ammonia. Different modifications of apparatus are employed for the saturation of the alkaline solution; perhaps the simplest consists in two air-tight vessels of cast iron, in one of which the carbonic acid is generated by the action of dilute sulphuric acid upon finely pounded marble, and conveyed by a tube into the solution of the subcarbonate contained in the other vessel. Both these vessels should be fitted with agitators; the one for stirring the marble and

acid, and the other for keeping the alkaline solution in motion whilst absorbing the carbonic acid.

By some oversight the College has directed too strong a solution of subcarbonate, the *liquor potassæ subcarbonatis* of the Pharmacopœia requiring to be diluted with about four parts of water; otherwise, sesquicarbonate and bicarbonate of potassa being much less soluble in water than the carbonate (subcarbonate of the Pharmacopœia), those salts are inconveniently precipitated during the process.

A pound of subcarbonate of potassa dissolved in five pounds of water, will require the carbonic acid of about half a pound of powdered marble evolved by half a pound of sulphuric acid, diluted with five times its weight of water. In adopting these proportions it is assumed that there is very little loss of carbonic acid.

Bicarbonate of potassa has a slightly alkaline taste and acts feebly upon vegetable colours; it is permanent in the air, and soluble in about four parts of water at 60°. When this solution is boiled, one fourth of the whole of the carbonic acid in the salt is dissipated, and a compound of carbonic acid and potassa, composed of one proportional of potassa and one and a half of carbonic acid, remains in solution, to which the term *sesquicarbonate of potassa* may be applied: hence the requisite caution as to temperature in evaporating the solution so as to obtain crystals. The composition of the bicarbonate is, as its name imports, two proportionals of carbonic acid and one of potassa, but the crystals include one proportional of water, and are, therefore, composed as follows:—

2 proportionals of Carbonic Acid	22×2	44
1 ——— Potassa		48
1 ——— Water		9
		101

This salt is used in medicine as an antacid in preference to the subcarbonate, in consequence of its less nauseous taste, and of its agreeing better with the stomach, so that it may be longer persevered in, and administered, if requisite, in larger

doses. It is very efficacious in correcting that state of the secretion of urine attended by excess of uric acid. Where there is considerable acidity upon the stomach, the evolution of carbonic acid is sometimes an objection to it, but this rarely occurs. It may be administered in doses of from twenty to forty grains, dissolved in any aromatic water, or mild bitter infusion. Two drachms have been taken three times daily, for two months, without any bad effect; in these large doses it generally proves evidently diuretic, and sometimes nauseates. When it occasions a white deposit in, or film upon, the urine, the dose should be diminished or discontinued, till that effect ceases. Like other alkaline remedies, this is merely a palliative in that kind of dyspepsia which is attended by the abundant production of acid in the stomach: in such cases it should be combined with bitters. The following are formulæ for its exhibition:—

In nephritic cases;—

℞ Potassæ Carbonatis, gr. xv.
Mistur. Amygdalæ f℥jss.
Tinct. Cardam. compos. f℥ss.
M. fiat haustus ter die sumendus.

In acid dyspepsia;—

℞ Potassæ Carbonatis ℈j.
Infus. Gentianæ compos.
Aquæ Pimentæ, āā f℥vj.
Tinctur. Rhei f℥j.
M. fiat haustus meridie et horâ somni sumendus.

Potassæ Subcarbonas. — *Subcarbonate of Potassa.*

℞ Potassæ impuræ contritæ libras tres,
Aquæ ferventis octarios tres cum semisse;
Liqua Potassam in Aqua, et cola; tum in vas ferreum nitidum effunde,

Take of impure Potassa, bruised, three pounds,
Boiling Water, three pints and a half;
Dissolve the Potassa in the Water and filter; then pour the solution into

et Aquam lento igne consume, ut spissescat Liquor; dein, igne subducto, spathâ ferreâ assiduè move, donec Sal in grana parvula abeat.

Potassæ Subcarbonas præparari potest, eodem modo, ex Tartaro, quod priùs ustum fuerit, donec cinerei sit coloris.

a clean iron vessel, and evaporate over a gentle fire until the liquor becomes thick; then, having removed it from the fire, stir the liquor constantly with an iron spatula until the Salt passes into a granular form.

Subcarbonate of Potassa may be prepared in the same manner from Tartar, previously burned until it becomes ash-coloured.

The salt intended to result from the above process, consists, in its dry state, of—

1 proportional of Potassa.....	= 48.	...	68.5
1 ——————— Carbonic Acid....	= 22	....	31.5
	70		100

Notwithstanding its alkaline properties, therefore, it ought to be termed *carbonate* of potassa.

When impure potassa, or pearlash, is acted upon by boiling water, other saline substances are apt to be taken up along with the subcarbonate; a preferable process, therefore, as above suggested (p. 144), consists in pouring upon it its weight of cold water, and after a few hours filtering off the solution through a clean linen bag; in this way, supposing the pearlash to be of ordinary composition and purity, little less than the subcarbonate will be left upon evaporation, and at all events the salt obtained will be sufficiently pure for medical use. Where a perfectly pure subcarbonate of potassa is required for any particular purpose, it may be best obtained by exposing the crystallised bicarbonate to a red heat.

Subcarbonate of potassa, as it is generally found in the shops, is in the form of a white granular powder, very deliquescent, nauseously alkaline to the taste, and acting upon vegetable coloured infusions in the manner of the pure alkali; exposed to a dull red heat it loses from 10 to 15 *per cent.* of water, but retains its carbonic acid. It is soluble in its own weight of water at 60°, and is insoluble in alcohol. Its principal use is in the preparation of saline draughts, twenty

grains saturating about half a fluid ounce of lemon juice; and in the formation of the *liquor potassæ subcarbonatis*.

Potassæ Sulphas.

℞ Salis qui restat post destillationem Acidi nitrici libras duas,

Aquæ ferventis congios duos;

Misce, ut liquetur Sal; tum adjice Potassæ Subcarbonatis quod satis sit ad Acidum saturandum. Dein coque, donec pellicula supernatet, et, ubi colaveris, sepone, ut fiant crystalli. Has, effuso liquore, super chartam bibulam exsicca.

Sulphate of Potassa.

Take of the salt which remains after the distillation of nitric Acid, two pounds,

Boiling Water, two gallons;

Mix, so that the Salt may be dissolved, and add as much Subcarbonate of Potassa as may be sufficient to saturate the Acid. Then boil the solution until a pellicle forms upon its surface, and after straining it, set it by, that crystals may form in it. Having poured off the solution, dry the crystals upon bibulous paper.

The salt which remains after the distillation of nitric acid is chiefly bisulphate of potassa, and in the above formula the excess of sulphuric acid is directed to be saturated by potassa, so that the whole may be rendered neutral. The composition and uses of this salt have already been pointed out (p. 142). In regard to the above formula, Mr. Phillips remarks, "that the most economical mode of procuring sulphate from bisulphate of potassa, is to saturate the excess of acid with lime, for sulphate of potassa is of less value than subcarbonate;" but this would render the process more troublesome in respect to the separation of the sulphate of lime, and the saving would be trifling.

By the old pharmaceutical writers, this salt was designated *arcanum duplicatum*, and *sal de duobus*.

Potassæ Supersulphas.

℞ Salis qui restat post destillationem Acidi nitrici libras duas,

Aquæ ferventis octarios quatuor;

Supersulphate of Potassæ.

Take of the Salt which remains after the distillation of nitric Acid, two pounds,

Boiling Water, four pints

Misce, ut liquetur Sal, et cola. Dein coque ad dimidium, et sepone, ut fiant crystalli. Has, effuso liquore, super chartam bibulam exsicca.

Mix, so that the Salt may be dissolved, and filter; then boil down to one half, and set aside, that crystals may form. Having poured off the liquor, dry them upon bibulous paper.

In the directions above given for the preparation of nitric acid, two proportionals of sulphuric acid are employed for the decomposition of one proportional of nitrate of potassa; we find accordingly that the salt which remains after the distillation, is a compound of one proportional of potassa and two of sulphuric acid; that is, that it contains, as was first shewn by Dr. Wollaston, just twice as much acid as the sulphate, and is properly a bisulphate. The following are its components, independent of water of crystallisation :—

2 proportionals of Sulphuric Acid...40 × 2	= 80.	62.5
1 ——————— Potassa	= 48.	37.5
	128	100

The crystals contain between 12 and 13 *per cent.* of water.

This salt is very sour, and much more soluble than the sulphate; one part requiring only two of water at 60°, and less than an equal weight at 212° for solution. It does not dissolve in alcohol. Exposed to a red heat, it loses its excess of acid, and is reduced to the state of neutral sulphate.

This salt is scarcely ever used, for in doses sufficient to open the bowels it generally gripes, and is not much more active than the sulphate. Where a sour saline remedy of this description is required, it is easily formed by the addition of dilute sulphuric acid to sulphate of potassa. Sulphate of soda may be given in the same way, but the larger quantity of water contained in the crystals of that salt renders a larger dose necessary. In dyspepsia, attended by a torpid state of bowels and loss of appetite, the following may be given daily at noon :—

℞ Infus. Rosæ compos. f3xiv.
Potassæ Sulphatis ℈ij.
Tinct. Gentianæ compos. f3j.
Acid Sulphur. dilut. minim. xv.
M. fiat haustus.

Potassæ Tartras.

℞ Potassæ Subcarbonatis uncias sedecim,
Potassæ Supertartratis libras tres,
Aqua ferventis congium ;

Potassæ Subcarbonatem in Aqua liqua ; tum adjice Potassæ Supertartratem in pulverem tritam, donec bullulæ non ampliùs excitentur. Liquorem per chartam cola ; dein coque donec pellicula supernatet, et sepone, ut fiant crystalli. Has, effuso liquore, super chartam bibulam exsicca.

Tartrate of Potassa.

Take of Subcarbonate of Potassa, sixteen ounces,
Supertartrate of Potassa, three pounds,
Boiling Water, a gallon ;

Dissolve the Subcarbonate of Potassa in the Water ; then gradually add the pulverised Supertartrate of Potassa, until it ceases to excite effervescence. Filter the solution through paper ; then boil it until a pellicle appears upon its surface, and set it by, that crystals may form. Having poured off the solution, dry the crystals upon bibulous paper.

In this formula the excess of acid in the bitartrate of potassa is saturated by the potassa of the subcarbonate, so as to form a neutral tartrate of potassa, composed of—

1 proportional of Tartaric Acid.....	67.	58.25
1 ——————— Potassa	48.	41.75
	115	100

The crystallised salt probably includes a portion of water ; its taste is bitterish, and strongly saline ; it is somewhat deliquescent, especially as it is usually found in the shops, namely, not crystallised as above directed, but evaporated to dryness and reduced to powder. It is soluble in two parts of water at 60° ; it also dissolves in alcohol.

This salt is an effective aperient in doses of from two to six drachms. It is a good adjunct to senna. With rhubarb and aromatics, it also affords a convenient purgative, rapid in its operation, and not liable to gripe. The following are formulæ of this kind :—

℞ Infus. Sennæ f3x.
Potassæ Tartratis 3ij.
Tinctur. Sennæ f3ij.
M. ft. haustus aperiens.

℞ Pulv. Rhei ℈j.
Potassæ Tartratis ʒj.
Olei Menthœ pip. gutt. iij.
M. fiat pulvis.

The following is Klein's *pulvis lenitivus hypochondriacus*:—

℞ Flavedinis Cort. Aurant.
Radicis Rhei,
Potassæ Tartratis, ää ʒss.
Olei Cajeput. gutt. iij.
M. ft. pulvis pro una dosi.

Tartrate of potassa may be obtained in the process for preparing the tartaric acid (see *Tartaric Acid*). It cannot be given in conjunction with the acids, nearly all of which decompose it, or by abstracting a portion of the potassa convert it into supertartrate. It is the *tartarus tartarisatus* and *tartarus solubilis* of old pharmacy.

PREPARATIONS OF SODA.

Sodæ Carbonas.

℞ Sodæ Subcarbonatis libram,

Aquæ destillatæ octarios tres;

Sodæ Subcarbonatem in Aqua destillata liqua. Dein Acidum carbonicum per liquorem in vase idoneo transmitte ad plenam saturationem, et sepone ut fiant crystalli. Crystallos chartâ bibulâ involutas et compressas exsicca. Consume liquorem reliquum, cavendo ne calor gradum 120^{mum} excedat, ut iterum prodeant crystalli. Has eodem modo comprime et exsicca.

Carbonate of Soda.

Take of Subcarbonate of Soda, a pound,
Distilled Water, three pints;

Dissolve the Subcarbonate of Soda in the distilled Water. Then having put the solution into a proper vessel, pass carbonic Acid into it until the Soda is completely saturated, and set it by, that crystals may form. Wrap the crystals in bibulous paper, and dry them by pressure. Evaporate the remaining liquor, taking care that the temperature does not exceed 120°, that crystals may again form in it. Press and dry these in the same manner.

When carbonic acid is passed into a solution of subcar-

bonate of soda the alkaline base combines with an additional proportional of carbonic acid, and small crystals of bicarbonate of soda are formed, which are less soluble in water than the subcarbonate, and which, exclusive of water of crystallisation, contain—

1 proportional of Soda.....		= 32
2 ——————Carbonic Acid.....	22×2	= 44
		76

When dried, even with the precautions above directed, these crystals effloresce and lose a part of their carbonic acid, so that the salt, as it is usually found in the shops, under the name of *carbonate* of soda, is intermediate between the subcarbonate and bicarbonate. According to Mr. Phillips, it consists of—

Carbonic Acid.....	39.76 or 3 proportionals of Carbonic Acid.....			22×3 = 66
Soda.....	38.55 — 2	——————	Soda.....	32×2 = 64
Water.....	21.69 — 4	——————	Water.....	9×4 = 36
	100			166

Independent therefore of water, it may be regarded as a compound of one proportional of carbonate of soda (subcarbonate of the Pharmacopœia) and one of bicarbonate of soda; it is, therefore, a *sesquicarbonate* of soda.

In its medical uses this salt corresponds with the subcarbonate, but its taste is less alkaline and unpleasant, and it generally is less disagreeable to the stomach. As a lithontriptic in cases of uric gravel, and as an antacid, it may be given in doses of from ten to forty or fifty grains, dissolved in water: its taste is almost entirely covered by excess of carbonic acid as it occurs in soda water, which is an agreeable and effectual form of this remedy; it must, however, be recollected that much of what is sold in London under the name of *soda water*, is merely water highly impregnated with carbonic acid, and this, though an agreeable drink, is of little medical efficacy: by some manufacturers soda water is very faithfully prepared of single, double, and treble strength, containing, in the half-pint bottle, half a drachm, one drachm,

and one drachm and a half of the crystallised subcarbonate, duly supersaturated with carbonic acid.

The *sodaic powders*, sold as a substitute for soda water, consist of carbonate of soda and tartaric acid; about thirty grains of each being usually put up in separate papers, and directed to be mixed in a half pint tumbler of water: this forms an agreeable effervescing draught, and containing tartrate of soda, it is slightly aperient, but very different in composition and effect from genuine soda water.

The following is a good remedy in common cases of heart-burn; it may be taken in a small wine-glass full of water:—

℞ Sodæ Carbonatis,
Magnesiæ Subcarbonatis,
Pulver. Flor. Anthemid. āā gr. x. M.

The other uses of carbonate of soda may be judged of from what is said under the following article, and from the general observations upon the alkaline remedies.

Sodæ Subcarbonas.

℞ Sodæ impuræ in pulverem tritæ libram,
Aquæ destillatæ ferventis octarios quatuor;

Coque Sodam in Aqua per horam dimidiam, et cola. Hæc vaporet ad octarios duos, et seponatur, ut fiant crystalli. Liquorem superstitem rejice.

Subcarbonate of Soda.

Take of impure Soda, reduced to powder a pound,
Boiling distilled Water, four pints;

Boil the Soda in the water for half an hour, and strain the solution; let it evaporate to two pints, and be set by, that crystals may form. Throw away the remaining solution.

Subcarbonate of soda may be obtained, as above directed, from barilla, kelp, and other substances containing it in a more or less impure state; it is, however, scarcely ever prepared in the pharmaceutical laboratory, being manufactured upon a large and more economical scale, and to be purchased in the market very pure, and at a comparatively low

price: it is often necessary to recrystallise it for medical use, especially when discoloured, as it often is, by oxide of iron.

Subcarbonate of soda forms large crystals, the primary form of which is, according to Mr. Phillips*, an oblique rhombic prism: their solubility and composition, with some other particulars respecting the salt, will be found under the head "Soda Impura," in the list of Materia Medica. From the statement there given, it appears to consist of one proportional of carbonic acid and one of soda, in its anhydrous state; and that the crystals contain eleven proportionals of water: it ought, therefore, to be termed, in strict propriety, *carbonate* and not *subcarbonate* of soda.

This is a very useful antacid and antilithic remedy; and where it is required to persevere for a long time in the use of alkaline remedies, it appears to agree better with the stomach than the corresponding salt of potassa. About twenty grains may be given twice or thrice a day, in an ounce and a half of almond mixture, where the object is to correct the red sediment of the urine; or in the following draught, where it is accompanied by acidity of the stomach, flatulency, and other dyspeptic symptoms.

℞ Sodæ Subcarb. ℈j.
Infus. Gentianæ compos.
Aquæ Pimentæ, ää f℥vj.
Tinctur. Cardamomi f℥j. M.

Like the other alkalies, if given in too large doses, it occasions a film of ammonia-magnesian phosphate, or a deposit of white sand composed of it and of phosphate of lime, in the urine: two drachms, taken in the morning upon an empty stomach, in a large cup of tea, produced a sensible effect in the urine voided ten minutes afterwards, and in two hours the urine became milky and alkaline.

Large doses of subcarbonate of soda are said to have been of use in *tic douloureux*, but the remedy is very uncertain. It has gained some confidence in the treatment of scrofula, and

* Transl. of Pharm. p. 61.

has been supposed to confer upon burnt sponge its chief efficacy; but there, iodine is probably the beneficial agent.

Sodæ Subcarbonas Exsiccata.

℞ Sodæ Subcarbonatis libram;

Sodæ Subcarbonati, in vase ferreo nitido, calorem ferventem adhibe, donec penitûs exsiccetur; eamque simul spathâ ferreâ assiduè move. Denique in pulverem tere.

Dried Subcarbonate of Soda.

Take of Subcarbonate of Soda, a pound;

Apply a boiling heat to the Subcarbonate of Soda in a clean iron vessel, and stir it constantly with an iron rod until it becomes perfectly dry. Lastly, reduce it to powder.

It appears from the composition of crystallised subcarbonate of soda already given (p. 165), that it contains in that state between 64 and 65 *per cent.* of water, the whole of which may be expelled at a red heat. In the above process the heat of boiling water is employed to dry it, which occasions a loss of about 25 *per cent.* upon the salt. In this dried state, subcarbonate of soda is conveniently administered in pills, combined with bitter extracts, in cases of dyspeptic acidity, as in the following formula:—

℞ Sodæ Subcarbonatis exsiccatæ,
Extracti Rhei,
Extracti Anthemidis, ää ℈j.
Fiat massa in pilulas xij. dividenda, quarum sumantur duæ bis die.

The following are Dr. Beddoes' lithontriptic pills, at one time much celebrated as a remedy for stone and gravel; and certainly effectual, where they do not disorder the stomach, in preventing the formation of uric sand:—

℞ Sodæ Subcarbon. exsicc.
Saponis duri, ää 3j.
Misce et divide in pilulas xxiv. sumat iij. vel iv. omni bihorio.

The following is an antacid stomachic powder, frequently taken with advantage at bedtime, to prevent the ill-effects of too much meat and drink upon a gouty or dyspeptic habit:—

℞ Sodæ Subcarb. exsiccat. gr. x.
Magnes. Carbon.
Cretæ Preparatæ, ää ℈j.
Pulv. Rad. Calumbæ gr. xv.
Pulv. Cinnamomi gr. v.
M. fiat pulvis horâ somni sumendus è cyatho aquæ.

Pills containing the common or crystallised, instead of the dried subcarbonate of soda, very soon crack and fall to pieces.

Sodæ Sulphas.

℞ Salis qui restat post destillationem Acidi muriatici libras duas,

Aquæ ferventis octarios duos cum semisse;

Liqua Salem in Aqua; tum adjice paulatim Sodæ Subcarbonatis quod satis sit ad Acidum saturandum. Decoque, donec pellicula appareat, et, ubi colaveris, sepone, ut fiant crystalli. Has, effuso liquore, super chartam bibulam exsicca.

Sulphate of Soda.

Take of the Salt which remains after the distillation of muriatic Acid, two pounds,

Boiling Water, two pints and a half;

Dissolve the Salt in the Water, then add gradually as much Subcarbonate of Soda as may be required to saturate the Acid; evaporate the solution until a pellicle appears upon its surface, filter it and set it by, that crystals may form. Having poured off the solution, dry the crystals upon bibulous paper.

It has already been stated that crystallised sulphate of Soda is a compound of—

1 proportional of Sulphuric Acid ..... = 40
1 ——————— Soda ..... = 32
10 ——————— Water.....9 × 10 = 90*

* A saturated solution of sulphate of soda, corked up in an air-tight phial, very gradually deposits crystals, at first perfectly transparent, but which, when the

and the theory of its formation, by the action of sulphuric acid upon common salt, has been explained under the head "Muriatic Acid." In the dose of six or eight drachms, this salt is an efficient aperient, but its taste is nauseously saline; and though frequently used as a domestic medicine, it has been superseded by sulphate of magnesia in practice.

Soda Tartarizata.

℞ Sodæ Subcarbonatis uncias viginti,

Potassæ Supertartratis contritæ libras duas,

Aquæ ferventis octarios decem;

Sodæ Subcarbonatem in Aqua liqua, et adjice paulatim Potassæ Supertartratem. Liquorem per chartam cola; tum coque, donec pellicula supernatet, et sepone, ut fiant crystalli. Has, effuso liquore, super chartam bibulam exsicca.

Tartarized Soda.

Take of Subcarbonate of Soda, twenty ounces,

Supertartrate of Potassa in powder, two pounds,

Boiling Water, ten pints;

Dissolve the Subcarbonate of Soda in the Water, and add gradually the Supertartrate of Potassa; filter the solution through paper; then evaporate it until a pellicle forms upon its surface, and set it by, that crystals may form. Having poured off the solution, dry the crystals upon bibulous paper.

This is a triple salt of tartaric acid, soda and potassa, composed, according to Vauquelin of—

54 Tartrate of Potassa.
46 Tartrate of Soda.

100.

supernatant solution crystallises, as it does on exposure to air, become opaque. These crystals are extremely hard; they contain, according to Mr. Faraday, equal weights of dry sulphate and of water, or—

1 proportional of dry Sulphate of Soda..... = 72
8 ——— Water.....9 × 8 = 72

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These proportions closely correspond with its theoretical composition, which should be—

1	proportional of Tartrate of Potassa.....	= 115
1	——————— Tartrate of Soda.....	= 99
		214

According to this statement, it includes no water of crystallisation. It is the *sal rupellense* and *sal Seignettii* of old Pharmacopœiæ, having been first introduced as an aperient, in doses of from half an ounce to an ounce, by M. de Seignette, a surgeon at Rochelle, who for a long time kept its composition secret. It forms large crystals, which are complex modifications of a primary rhombic prism. What has been said elsewhere of the use of the saline purgatives, applies to this; it is less disagreeable, but also less effective than sulphate of magnesia. It dissolves in rather less than five parts of water at 60°, and may be administered in any of the usual vehicles; not, however, without a partial decomposition in those containing the free mineral acids, as infusion of roses, &c. It may be prescribed, not inelegantly, in almond emulsion; and, if sufficiently diluted, generally proves mildly aperient in doses below half an ounce.

℞ Sodæ Tartarizatæ Pulver. ℥vj.
Misturæ Amygdalæ f ℥vss.
Spiritûs Myristicæ f ℥ss.
M. sumat tertiam partem secundâ quâque horâ.

This salt enters into the composition of the effervescent aperient commonly sold under the name of *Seidlitz powders.* "These consist of two different powders; the one, contained in a white paper consists of ʒij. of *tartarised soda* and ℈ij. of *carbonate of soda;* that in the blue paper, of xxxv. grains of *tartaric acid.* The contents of the white paper are to be dissolved in half a pint of spring water, to which those of the blue paper are to be added: the draught is to be taken in a state of effervescence. The acid being in excess, renders it more grateful, and no less efficacious as a purgative *."

* Paris, Pharmacologia, vol. ii. p. 381.

EARTHS AND THEIR SALTS.

PREPARATIONS OF ALUMINA.

Alumen Exsiccatum. — *Dried Alum.*

Alumen in vase fictili ad ignem liquescat; tum augeatur ignis, donec ebullitio cessaverit.

Expose Alum in an earthen vessel to the fire so that it may liquefy, and let the heat be continued until the ebullition ceases.

By reference to the article "Alumen" in the Materia Medica, it will be found that alum, in its usual state, contains nearly half its weight of water of crystallisation: by the above process the greater part of this is dissipated, and the salt rendered more active as an escharotic, provided care be taken to exhale none of its acid, which frequently is the case, by the application of too intense heat.—(See page 19.)

Liquor Aluminis Compositus. — *Compound Solution of Alum.*

℞ Aluminis,
Zinci Sulphatis, singulorum unciam dimidiam,
Aquæ ferventis octarios duos;

Alumen et Zinci Sulphatem in Aqua simul liqua; dein per chartam cola.

Take of Alum,
Sulphate of Zinc, of each half an ounce,
Boiling Water, two pints;

Dissolve the Alum and the Sulphate of Zinc in the Water; then filter through paper.

This is a powerfully astringent solution, formerly more used than at present as an injection in gleets and fluor albus,

for which purposes it requires due dilution. It furnishes a good collyrium in some cases of ophthalmia, diluted with rose or elder-flower water; but it must also be recollected that much mischief frequently results from the injudicious use of corrugating eye-washes.

A small proportion of mucilage of gum arabic is often a good addition to astringent injections; it retains them longer upon the parts: upon this principle the following may be used for the cure of gleet:—

℞ Liquoris Aluminis compositi f℥vj.
Aquæ destillatæ f℥vjss.
Mucilaginis Arabici ℥ss. M.

The following collyrium may be employed in ophthalmia, after local bleeding has been properly resorted to:—

℞ Liq. Alum. compos. f℥ss.
Aquæ Rosæ f℥vss. Misce.

PREPARATIONS OF LIME.

Calx.

℞ Marmoris albi libram;

In frustula contunde, et in crucibulo igne acerrimo ure per horam, vel donec Acidum carbonicum penitùs expulsum fuerit, adeò ut Acidum aceticum dilutum adjectum nullas bullulas excitet.

Lime.

Take of white Marble, a pound;

Break it into small fragments, and heat them in a crucible in a very strong fire for an hour, or until the carbonic Acid is completely expelled, so that on the addition of diluted acetic Acid no effervescence may be excited.

Calx è Testis.

Eodem modo Calx fiat etiam è Testis.

Lime from Shells.

By the same method Lime may also be prepared from Shells.

Two sources of pure lime are unnecessarily resorted to in the above formulæ from the Pharmacopœia; the first is quite sufficient; but for all general purposes the common lime of the kiln is pure enough for pharmaceutical use, and is generally employed, to the exclusion of the above varieties: this, therefore, might have had a place in the Materia Medica. Pure carbonate of lime, white marble for instance, loses about 44 *per cent.* of carbonic acid, when duly subjected to heat, leaving 56 of lime; it is therefore a compound of—

1 proportional of Carbonic Acid	=	22
1 ——— Lime	=	28
		50

But lime is itself a metallic oxide, composed of—

1 proportional of Calcium	=	20
1 ——— Oxygen	=	8
		28

and carbonic acid consists of—

1 proportional of Carbon	=	6
2 ——— Oxygen	=	16
		22

the ultimate elements, therefore, of carbonate of lime are—

1 proportional of Calcium	=	20
1 ——— Carbon	=	6
3 ——— Oxygen	8×3 =	24
		50

Lime has an acrid alkaline taste, and acts powerfully on vegetable colours in the manner of the alkalies. Exposed freely to air, it absorbs water and carbonic acid, and is ultimately converted into carbonate of lime. Sprinkled with water, it rapidly absorbs and consolidates a considerable portion of that fluid, evolving much heat, and crumbling down

into a white powder, which is a *hydrate of lime*, or, as it is commonly called, *slaked lime*. In this process the lime combines with rather more than a third of its weight of water, and the compound contains—

1 proportional of Lime	= 28	....	75.75
1 ——————— Water	= 9	....	24.25
	37		100

Lime is not administered internally, but it is used in a variety of pharmaceutical preparations.

Liquor Calcis.

℞ Calcis selibram,
Aquæ destillatæ octarios duodecim;

Calci Aquam affunde, et simul agita; tum protinus vas contege, et sepone per horas tres; dein Liquorem cum Calce superstite in vasis vitreis obturatis serva, et, ubi utendum est, ex limpido Liquore sume.

Lime Water.

Take of Lime, half a pound,
Distilled Water, twelve pints;

Pour the Water upon the Lime and shake them together; then cover the vessel immediately, and set it aside for three hours; lastly, keep the solution upon the remaining Lime in stopped glass vessels, and when it is to be used take the clear solution.

There is a peculiarity in respect to the solubility of lime not easily accounted for, which is, that it is less soluble in hot than in cold water: accordingly when a cold saturated aqueous solution of lime is boiled, it becomes turbid, and hydrated lime is deposited in very minute granular crystals. Mr. R. Phillips, to whom we are indebted for this fact, found * that—

A pint of Water at	32°	dissolves	11.0 grains of Lime.
———————	60°	———	9.7 ———————
———————	212°	———	5.6 ———————

* Trans. Pharm. p. 72.

so that water at 32° dissolves very nearly twice as much lime as at 212°.

Lime-water, though it holds so little of the earth in solution, is strongly alkaline to the taste and to the test of vegetable colours; it absorbs carbonic acid from the air, and the lime gradually separates in the state of carbonate, in successive pellicles; so that it should be kept in well-corked vessels.

Lime-water has been exhibited in a variety of disorders, among which acid dyspepsia, and its attendant diarrhœa, gravel, worms, and certain cutaneous affections, might be enumerated: it is, however, an inconvenient and ineffective form of alkaline medicine; and is not entitled, in any of the above cases, to much consideration.

Calcis Murias.	*Muriate of Lime.*
℞ Salis qui restat post sublimationem Ammoniæ Subcarbonatis libras duas,	Take of the Salt which remains after the sublimation of Subcarbonate of Ammonia, two pounds,
Aquæ octarium;	Water, a pint;
Misce et per chartam cola; vaporet liquor donec Sal exsiccetur. Hunc in vase accuratè obturato serva.	Mix and filter through paper. Evaporate the solution until the Salt becomes dry. Keep it in a vessel well stopped.

What is here termed *muriate of lime* is, in fact, a *chloride of calcium*, as may be seen by reference to the explanatory diagram under the article "Subcarbonate of Ammonia," page 213. In the above process, the residue of the sublimation of subcarbonate of ammonia is treated with distilled water, and the solution being evaporated to dryness, furnishes a white, fusible, deliquescent, and very soluble substance, which in its dry state consists of—

1 proportional of Calcium	= 20	....	35.65
1 ———— Chlorine	= 36	....	64.35
	56		100

It has a pungent bitter saline taste, and is rarely employed, except in solution, as in the next article.

It is usual in the pharmaceutical laboratory to prepare the *calcis murias* by saturating muriatic acid with carbonate of lime, filtering the solution, evaporating it to dryness, and fusing the dry residue, so that it may be poured out upon a copper plate, and when hard broken into pieces. It must be kept in well-closed phials.

By exposing a strong solution of chloride of calcium to the temperature of 32°, it forms prismatic crystals, containing, according to Mr. Phillips *,—

1 proportional of Chloride of Calcium	= 56	51
6 ——————— Water.....	9 × 6 = 54	49
	110	100

Powdered chloride of calcium, mixed with snow, produces a freezing mixture capable of lowering the thermometer from + 32° to — 50°.

In scrofula, this compound has been administered in the form of pill with extract of hemlock, as follows:—

℞ Calcis Muriatis gr. ij.
Extracti Conii gr. iv.
Fiant pilulæ duæ bis vel ter quotidie sumendæ.

Liquor Calcis Muriatis.	*Solution of Muriate of Lime.*
℞ Calcis Muriatis uncias duas, Aquæ destillatæ fluiduncias tres;	Take of Muriate of Lime, two ounces, Distilled Water, three fluid ounces;
Calcis Muriatem in Aqua liqua; tum per chartam cola.	Dissolve the Muriate of Lime in the Water; then filter through paper.

Muriate of lime and muriate of baryta have both had their advocates as remedies in scrofula: the former is less mis-

* Ann. of Phil. vol. vi. p. 343.

chievous, and, I believe, equally effective with the latter; but it is extremely doubtful whether it has in any instance proved decidedly beneficial. Mr. A. T. Thomson recommends it in bronchocele, and says that he has witnessed more benefit from its continued use in the varied forms of scrofula than from any other remedy. The above solution may be given in the dose of from ten to twenty minims, twice or thrice a day, to children, and of half a drachm to two drachms to adults, diluted with about an ounce or an ounce and a half of any aromatic water. It may be conjoined with chalybeates, bitters, and other tonics, or with hemlock and alteratives. If the dose be too large it nauseates, and even produces vomiting, an effect which may be mitigated by combining with it a little opium. The following are formulæ for its use:—

℞ Liquoris Calcis Muriatis f3ss.
Aquæ Pimentæ f3x.
Syrupi Croci,
Spiritûs Carui, āā f3ss.
Fiat haustus sextâ quâque horâ sumendus.

Or the following, where it nauseates:—

℞ Liquoris Calcis Muriatis f3ss.
Tincturæ Opii ℥v.
Infusi Aurantii compos. f3xj.
Tincturæ Cardamomi compos. f3j.
M. fiat haustus ter in die capiendus.

Creta Præparata.

℞ Cretæ libram;

Cretæ adjice Aquæ paululum, et tere, ut fiat pulvis subtilis. Hunc in vas amplum Aquâ plenum conjice; tum agita, et, brevi morâ interpositâ, in vas aliud Aquam adhuc turbidam supernatantem transmitte, et sepone, ut subsidat pulvis; denique effusâ Aquâ, pulverem exsicca.

Prepared Chalk.

Take of Chalk, a pound;

Add a little Water to the Chalk, and rub it into a fine powder. Throw this into a large vessel full of water, then stir it, and after a short interval decant the supernatant turbid water into another vessel, and set it by that the powder may subside; lastly, having poured off the water, dry the powder.

The principal object of the above process, is to free the chalk from any soluble matter which it may accidentally contain, and to reduce it to the state of impalpable powder. Pure carbonate of lime consists, as before mentioned, of—

1 proportional of Lime	=	28
1 ——————— Carbonic Acid	=	22
		50

it is insipid, and very nearly insoluble in water, except carbonic acid be present, when it is readily taken up.

The principal use of prepared chalk is, as has already been stated, (p. 71,) as an antacid or absorbent, in doses of from ten to forty or fifty grains. The *mistura cretæ* may supersede most other formulæ for its exhibition.

PREPARATIONS OF MAGNESIA.

Magnesia.	*Magnesia.*
℞ Magnesiæ Subcarbonatis uncias quatuor;	Take of Subcarbonate of Magnesia, four ounces;
Igne acerrimo ure per horas duas, vel donec Acidum aceticum dilutum nstillatum nullas bullulas excitet.	Heat it intensely for two hours, or until diluted acetic Acid, dropped upon it, excites no effervescence.

The loss of weight sustained in the above process by the subcarbonate of magnesia is extremely variable; it includes carbonic acid and water, and generally amounts to between 50 and 60 *per cent.*, of which from 15 to 20 *per cent.* is water, and the remainder carbonic acid. The medicinal uses of magnesia, and of its subcarbonate, have been mentioned above (p. 112).

The researches of Sir H. Davy have shewn, that magnesia, like the other alkaline earths, is a metallic oxide, containing probably about 40 *per cent.* of oxygen. The equivalent

number of the earth is 20, and it is considered as a compound of—

1 proportional of Magnesium.....	=	12
1 ———— Oxygen	=	8
		20

We are directed, in the above formula, to heat the subcarbonate very intensely; but a red heat is quite sufficient to expel the carbonic acid and water, and, if the heat be raised to whiteness, the contents of the crucible are apt to become lumpy. Great care should be taken, that no particles of dust or cinders fall into the crucible; and it is generally right to pass the magnesia through a fine sieve after its calcination. Attention should also be paid to the original purity of the subcarbonate, especially to its freedom from lime; which it sometimes contains in small quantities, and which gives an acrimony and alkaline flavour to the magnesia not naturally belonging to it.

Magnesia may be called insoluble in water; when moistened upon turmeric paper it slightly reddens it; but water filtered through magnesia has no effect upon the most delicate vegetable colours.

Magnesia absorbs moisture and carbonic acid very slowly, when long exposed to the atmosphere.

Magnesiæ Subcarbonas.	*Subcarbonate of Magnesia.*
R Magnesiæ Sulphatis libram, Potassæ Subcarbonatis uncias novem, Aquæ congios tres;	Take of Sulphate of Magnesia, a pound, Subcarbonate of Potassa, nine ounces, Water, three gallons;
Potassæ Subcarbonatem in Aquæ octariis tribus, Magnesiæ Sulphatem in Aquæ octariis quinque, separatim liqua, et cola; dein Liquori Magnesiæ Sulphatis reliquam Aquam adjice, et coque; eique, dum ebullit, li-	Dissolve separately the Subcarbonate of Potassa in three pints of the Water, and the Sulphate of Magnesia in five pints of the Water, and filter; then add the remaining Water to the Solution of Sulphate of Mag-

quorem priorem admisce, spathâ assiduè movens; tum per linteum cola; denique pulverem, affusâ sæpius aquâ fervente, ablue, et calore gradûs 200mi super chartam bibulam exsicca.

nesia, and boil, and while it is boiling mix the former solution with it, stirring them thoroughly with a spatula; then strain through linen; lastly, wash the powder repeatedly with boiling water, and dry it at a temperature of 200° upon bibulous paper.

Dry sulphate of magnesia is a compound of—

1 proportional of Magnesia.....	= 20	}	= 60
1 ——————— Sulphuric Acid.....	= 40		

and the salt in *crystals*, as it usually occurs, contains—

1 proportional of dry Sulphate.....	= 60	}	= 123
7 ——————— Water.....	9 × 7 = 63		

Sulphate of magnesia is usually prepared by the wholesale manufacturer, either from sea water or from magnesian limestone; it has, therefore, a place in the Materia Medica, where its uses are pointed out (p. 113). It is generally in minute indeterminate crystals, but by slowly evaporating its solution it may easily be obtained in regular quadrangular prisms, terminated by transverse dihedral summits, and not affected by exposure to the atmosphere. They are soluble in their own weight of water at 60°, and in about three-fourths their weight at 212°.

In the formula at the head of this article, sulphate of magnesia is decomposed by subcarbonate of potassa for the production of subcarbonate of magnesia. The process is not merely a simple case of double decomposition, for if so, carbonate of magnesia and sulphate of potassa should alone result; whereas the precipitate is deficient in the due proportion of carbonic acid, and appears to be a compound of carbonate and of hydrate of magnesia, in the proportion (when carefully dried at 212°) of about 73 parts of carbonate and 27 of hydrate, though the composition of the hydrate, as it

exists in the compound, is not quite evident. Dr. Henry gives the following as its probable composition * :—

Magnesia in the Carbonate	34.34	45.82
——————Hydrate	11.48	
Carbonic Acid		38.42
Water		15.76
		100

The subcarbonate of magnesia of the shops, however, from being imperfectly dried, retains usually rather a larger relative proportion of water.

The College direct this substance to be precipitated from the boiling solution; if precipitated cold it retains more carbonic acid, and when carefully dried, the product is lighter and softer to the touch.

The medical use of magnesia and of subcarbonate of magnesia is described under that article in the Materia Medica (p. 112).

* Elements, 9th edit. vol. i. p. 594.

METALS AND THEIR SALTS.

PREPARATIONS OF ANTIMONY.

Antimonii Sulphuretum Præcipitatum.

℞ Antimonii Sulphureti contriti libras duas,
Liquoris Potassæ octarios quatuor,
Aquæ destillatæ octarios tres,
Acidi sulphurici diluti quantum satis sit;

Sulphuretum Antimonii, Liquorem Potassæ, et Aquam inter se misce, et coque igne lento per horas tres, assiduè movens, adjectâ subinde Aquâ destillatâ, adeò ut eandem mensuram semper impleat. Liquorem per linteum duplicatum protinùs cola, eique adhuc ferventi instilla paulatim Acidi sulphurici diluti quantum satis sit ad pulverem dejiciendum; tum Aquâ calidâ Potassæ Sulphatem ablue, Antimonii Sulphuretum præcipitatum exsicca, et in pulverem subtilem tere.

Precipitated Sulphuret of Antimony.

Take of Sulphuret of Antimony, in powder, two pounds,
Solution of Potassa, four pints,
Distilled water, three pints,
Diluted Sulphuric Acid, a sufficient quantity;

Mix the Sulphuret of Antimony, the solution of Potassa, and the water, and boil them over a slow fire for three hours, stirring them constantly, and occasionally adding distilled water, so that the original quantity may be preserved. Strain the liquor quickly through a double linen cloth, and while it is yet hot, gradually drop in a sufficient quantity of diluted sulphuric Acid to throw down the powder; then wash away the Sulphate of Potassa with hot Water; dry the precipitated Sulphuret of Antimony, and reduce it to a fine powder.

What is here termed "precipitated sulphuret of antimony" is, in fact, a hydrosulphuretted protoxide of antimony with

sulphur. It is the "golden sulphur of antimony" of old Pharmacopœiæ, and consists, according to Thenard's analysis, of—

Sulphur	12.00
Sulphuretted Hydrogen	17.87
Protoxide of Antimony	68.30
	98.17
Loss	1.83
	100

But these proportions only approximate to correctness; and I believe the quantity of apparently uncombined sulphur will generally be found to exceed the above.

When sulphuret of antimony (p. 28) is boiled with solution of potassa, a portion of water is decomposed, and the result is a solution of hydrosulphuretted protoxide of antimony. This, *whilst hot*, is decomposed by sulphuric acid, sulphuretted hydrogen is evolved, sulphate of potassa formed, and a compound of protoxide of antimony, sulphuretted hydrogen, and sulphur, is precipitated. When carefully dried, this precipitate is of a red-brown colour, with a shade of orange; it is insipid, insoluble in water, and in dilute sulphuric acid.

This preparation is among the uncertain antimonials, improperly, as we think, retained in the Pharmacopœia. Like the other compounds of protoxide of antimony, it is diaphoretic and emetic, but it is scarcely ever employed except in very small doses, as an alterative in cutaneous affections, and in combination with calomel in chronic rheumatism, as in the "*pilulæ hydrargyri submuriatis*," a formula originating with Dr. Plummer, uncertain in its effects, and unchemical in its nature.

As this compound is of variable activity, the dose should be small at first, and gradually increased. Half a grain will generally suffice to begin with, and from two to three grains are usually enough to nauseate, purge, or vomit. In chronic rheumatism it is not unfrequently prescribed with small doses

of opium, of henbane, or of hemlock, conjoined with mercurials, as in the following formulæ :—

℞ Antimonii Sulphur. præcip. gr. v.
Pilul. Hydrargyr.
Extract. Hyoscyami, āā ℈j.
Misce ut fiat massa in pilulas decem dividenda, quarum sumatur una ter die.

℞ Sulphureti Antimonii præcipitati,
Hydrargyri Submuriatis, āā gr. ss.
Extracti Conii gr. iv.
Fiat pilula ter die sumenda.

With either of these half a pint to a pint of decoction of sarsaparilla may be taken during the day, and as they keep up more or less perspiratory action, all sudden changes of temperature and exposure to cold should carefully be avoided.

Antimonium Tartarizatum. — *Tartarised Antimony.*

℞ Vitri Antimonii in pulverem subtilissimum contriti,
Potassæ Supertartratis contritæ, singulorum libram,
Aquæ destillatæ ferventis congium ;

Vitrum Antimonii cum Potassæ Supertartrate accuratè misce, et in Aquam destillatam ferventem paulatim conjice, spathâ assiduè movens ; coque per quadrantem horæ, et sepone. Liquorem frigefactum cola, et liquorem colatum decoque ut fiant crystalli.

Take of Glass of Antimony very finely powdered,
Supertartrate of Potassa, in powder, of each a pound,
Boiling distilled Water, a gallon ;

Accurately mix the glass of Antimony and the Supertartrate of Potassa, and add them by degrees to the boiling distilled Water, constantly stirring it with a spatula ; boil for a quarter of an hour and set it by. Filter the solution when cold, and evaporate the filtered liquor so that crystals may form.

When protoxide of antimony is boiled with supertartrate of potassa, a considerable portion is dissolved by the excess of acid in the latter salt, which is thus neutralised, and the solution affords, on evaporation, crystals of emetic tartar : the

general form of which is that of an octaedron with a rhombic base. Their composition has been variously stated, and experiments are still wanting to demonstrate the relative proportions of its component parts; its most probable composition is one proportional of bitartrate of potassa, and three of protoxide of antimony, or—

Bitartrate of Potassa	= 182
Protoxide of Antimony (53 × 3)	= 159
	341

It is assumed that the protoxide of antimony consists of one proportional of antimony and one of oxygen (45+8=53.)

Various modes of preparing a protoxide of antimony for the production of this salt have been suggested, and adopted in the different Pharmacopœiæ. It is readily obtained from the submuriate and subsulphate of antimony by washing those salts with solution of potassa; but glass of antimony, prescribed in the above formula, is an excellent substitute for the other varieties, and may generally be had in the market as imported from Germany, at a very moderate price. Its usual component parts are protoxide of antimony, sulphuret of antimony, and silica. When *very finely powdered*, it is readily acted on by the tartar, though, as remarked by Mr. Phillips, the ebullition should be continued for a longer time than above directed. Glass of antimony is sometimes adulterated with oxide of lead, a fraud easily detected by digesting it in nitric acid, which solution, if lead be present, affords a white precipitate on the addition of dilute sulphuric acid. The most troublesome sophistication is that in which pieces of glass of lead are mixed with pure glass of antimony, in which case they are difficultly recognised by the eye: it is, therefore, as well to examine the bulk of the powdered glass of antimony for lead, previous to boiling it with the tartar.

Glass of antimony is merely inserted in the list of the Materia Medica of the Pharmacopœia, and no process is given for its preparation; as however it sometimes cannot be procured, except at a high price, it may not be improper here to state the method of forming it:—

Sulphuret of antimony in powder is exposed in a shallow iron dish to a very moderate heat, and is kept constantly stirred to prevent agglutination; if this happens, it must be removed from the fire and again reduced to powder. When a moderate heat ceases to cause the evolution of sulphureous vapours, the fire must be gradually increased till they again appear, and in this way it may be slowly augmented till the bottom of the dish becomes red hot, and fumes of sulphur are no longer evolved. The grey powder thus obtained answers well for the production of tartarised antimony; but if it be desired to vitrify it, it must be put into a covered earthen crucible and exposed to a strong heat till it fuses into a clear glass, when it may be poured out upon a brass plate; it should be transparent, and of a bright brownish-red or hyacinthine colour.

Glass of antimony was formerly used as a diaphoretic, laxative, and emetic, but is now properly laid aside.

In preparing emetic tartar, the operator should take care that the crystals are well defined, and not mixed with those of uncombined tartar; if crystalline tufts of tartrate of lime form with the other crystals, they may easily be brushed off when the supernatant liquor is poured away.

The crystals of emetic tartar, at first transparent, soon become translucent and opaque, slightly effloresing upon the surface, and acquiring a yellowish hue. They dissolve in about two parts of boiling water, and in fifteen parts at 60°, and are insoluble in alcohol. The aqueous solution soon spontaneously decomposes.

Tartarised antimony, alone or in combination, is capable of fulfilling a variety of important indications in disease. In very small doses it acts principally upon the skin; in larger doses it nauseates and produces purging and vomiting, together with a more powerful diaphoretic effect. As a diaphoretic it may be given in repeated doses of an eighth of a grain to half a grain conjoined with saline remedies, in solution. Or it may be administered as an oxide of antimony with chalk or magnesia.

℞ Antimonii Tartarisati, gr. j. solve in
Aquæ distil. f℥j.

℞ Solutionis prescriptæ f℥j.
Liq. Ammon. Acetat. f℥ss.
Mistur. Camphor. f℥x.
Syrup. Aurant. f℥ss.
M. fiat haustus tertiâ vel quartâ quâque horâ adhibendus.

℞ Potass. Subcarbonatis ℥j.
Succi Limonum recentis f℥iss. vel q. s. ad saturationem,
Aquæ Cinnamomi f℥j.
Aquæ distill. f℥iij.
Solutionis præscriptæ f℥iij.
Syrupi Tolutani f℥ij.
M. fiat mistura, cujus sumantur cochlearia duo magna omni horâ.

In thus employing emetic tartar, it is better to direct an extemporaneous solution, as above, than to trust to the *vinum antimonii tartarisati* of the Pharmacopœia.

℞ Antimonii Tartarisati gr. j.
Cretæ preparatæ,
Sacchari albi, āā ℥ss.
Accuratissimè misce, et divide in partes decem æquales, quarum sumat unam secundâ quâque horâ.

The operation of these powders may be aided by warm drinks, and by other sudorifics, and, if necessary, the dose of the antimonial may be doubled, or in some cases quadrupled, till it produces the desired effect. For children, the dose, as a diaphoretic, is from a sixteenth to a fourth of a grain: the latter seldom fails to nauseate.

When emetic tartar is given mixed with chalk or other substance by which it is decomposed, and its protoxide of antimony separated, it appears to have more tendency to act on the bowels and less to nauseate, than when in undecomposed solution. As an alvine evacuant it is, however, principally valuable in conjunction with common purges, which it often remarkably aids in their operation; it also assists the action of expectorants, and with that view is sometimes combined with squills, ammoniacum, &c.

As an emetic, tartarised antimony is seldom given alone, but one grain is mixed with ten or fifteen of ipecacuanha;

the compound is quick and certain in its action. The best mode of administering it as an emetic alone, is the following:—

℞ Antimon. Tartarisat. gr. iij.
Mistur. Camphoræ f℥iv.
M. sumat quartam partem singulis horæ quadrantibus, donec vomitus excitatus sit.

In this way considerable nausea is produced, and the evacuation of the stomach may be very completely effected by the aid of warm water or chamomile tea. It is an effectual emetic at the commencement of many febrile diseases, and the action upon the skin must be maintained by diluents and keeping in bed.

Emetic tartar is occasionally employed externally in the form of ointment, as a means of producing irritation and a pustular eruption upon the skin, which it does very effectually, though it is seldom thus prescribed, partly on account of the troublesome ulceration which sometimes ensues, and partly in consequence of other rubefacients answering equally as irritants, without any such inconvenience. The proportion of tartarised antimony to that of lard or common white ointment is about two drachms to one ounce: the salt should be reduced to a very fine powder, and very perfectly triturated with the grease.

This salt in large doses is a virulent poison when it remains for any time in the stomach; but it is usually soon rejected, and the only necessary treatment consists in the copious administration of warm water. Infusions of bark and of galls have been recommended as antidotes by Orfila*, who supposes that by decomposition they disarm emetic tartar of its powers; but their beneficial action upon this principle is very doubtful. If free vomiting does not occur, oil and warm water will sometimes induce it; or nauseous vegetable infusions taken warm, as of chamomile, or wormwood. When the stomach has been emptied, opium and other narcotics may be used to allay the spasmodic and nervous symptoms,

* Traité des Poisons, vol. i, p. 224.

and in case of any consecutive inflammatory action, bleeding may be resorted to.

The above are the principal uses of emetic tartar; the facility with which it is prepared, the certain uniformity of its composition, the ease with which it is exhibited in divided doses, and the circumstance of its performing all that can be attained by the other antimonials, point it out as their common substitute, and lead us to regret that any uncertain and ineffectual preparations of the metal are retained in the Pharmacopœia.

Vinum Antimonii Tartarizati.	*Wine of Tartarised Antimony.*
℞ Antimonii tartarizati scrupulum,	Take of tartarised Antimony, one scruple,
Aquæ destillatæ ferventis fluiduncias octo,	Boiling distilled Water, eight fluid ounces;
Spiritûs rectificati fluiduncias duas;	Rectified Spirit, two fluid ounces;
Antimonium tartarizatum in Aqua destillata fervente liqua; tum liquori colato spiritum adjice.	Dissolve the tartarised Antimony in the boiling distilled Water; then add the spirit to the filtered liquor.

Tartarised antimony is perfectly insoluble in alcohol, but the addition of two ounces of alcohol to the dilute solution in the above formula causes no precipitation, and so far is unobjectionable. It will be remarked that the term *vinum* is here applied to a solution containing no wine; while the vinous solution of the late Pharmacopœia was called *liquor;* an anomalous mode of nomenclature, productive of some inconvenience: the strength of the two solutions is, however, similar; two grains of emetic tartar being contained in each fluid ounce. Almost all the solutions of emetic tartar are liable to spontaneous changes, and in some of them they take place rapidly in warm weather. The *vinum* of the above formula remains clear for a long time, and offers, at all events when recently prepared, a convenient solution, by which small doses of its active ingredient may be portioned

out. In doses of from ten to thirty drops it acts as a diaphoretic when given with saline medicines, warm drinks, and other auxiliaries; one to two drachms generally nauseates; and half an ounce to an ounce may be used as a vomit. In prescribing this, and other antimonials, it must not be forgotten that from idiosyncrasy a very small dose sometimes proves eminently active, and in such cases a grain of the salt not only evacuates the stomach, but occasions protracted vomiting, spasms of the stomach and abdominal muscles, fainting, and other untoward symptoms: these are best counteracted by cordials with opiates.

Pulvis Antimonialis.

℞ Antimonii Sulphureti contriti libram,
Cornuum rasorum libras duas;

Misce et conjice in crucibulum latum igne candens, et assiduè move donec vapor conspicuus non ampliùs ascendat. Quod restat in pulverem tere et crucibulo idoneo immitte. Tum ignem subministra et paulatim auge ut candeat per horas duas. Residuum tere ut fiat pulvis subtilissimus.

Antimonial Powder.

Take of Sulphuret of Antimony in powder, a pound,
Hartshorn shavings, two pounds;

Mix, and throw them into a wide crucible heated to whiteness, and stir constantly, as long as much vapour arises. Reduce what remains to powder, and put it into a proper crucible. Then expose it to a gradual fire, and heat it to whiteness for two hours. Reduce the residue to a very fine powder.

The activity of antimonials entirely depends upon the state of oxidizement of the metal; the protoxide is very active; the peroxide comparatively inert, and requiring, therefore, to be administered in very large doses to produce those effects which result from very small doses of the former; and even then it is but uncertain in its operation. All antimonials, therefore, which are liable to contain the metal in uncertain or indeterminate degrees of oxidizement, or rather, which may contain varying proportions of the two oxides, are highly objectionable, and among them none more so than the above, which sometimes is active and sometimes inert, according as more or less of the protoxide is left in the product.

By the action of heat as above directed, the sulphur is in the first instance burnt off, and the antimony converted into protoxide, as in the process for making glass of antimony; the protoxide itself is volatile, and accordingly, at the high temperature directed above, it also is partly volatilised and partly converted into a fixed peroxide, and what remains is chiefly bone-earth, with this peroxide and a trace of protoxide, the quantity and state of the oxide depending upon slight modifications in the process, which can scarcely be controlled. Accordingly, upon submitting "pulvis antimonialis," prepared by different persons and at different times, to analysis, its composition is found to be extremely variable, and in two instances scarcely any oxide of antimony could be detected in it. Mr. Phillips analysed two samples with the following results:—

Peroxide of Antimony	35	38
Phosphate of Lime	65	62
	100	100

But I have generally found a greater discordance, and in some instances, as much as *5 per cent.* of protoxide has been detected, contributing of course to the activity of the powder.

Antimonial powder was originally introduced into the Pharmacopœia as a substitute for James's celebrated fever powder, which, according to the analysis of Dr. Pearson*, verified by Mr. Phillips†, consists of—

Peroxide of Antimony	56
Phosphate of Lime	44
	100

It may be right to state that the oxides of antimony which I have here termed *protoxide* and *peroxide* are respectively composed of one proportional of metal and one of oxygen, and one of metal and two of oxygen, and that the number

* Phil. Trans. vol. lxxxi. † Transl. Pharmacop. p. 85.

45 is assumed as the prime equivalent of antimony; the equivalent, therefore, of the protoxide is (45+8)=53, and that of the peroxide (45+16)=61. Whether there exist other true oxides of antimony, or whether there is an intermediate definite compound of the two oxides above mentioned, may admit of doubt; perhaps the "argentine flowers of antimony" are of the latter description.

Antimonial powder is principally employed as a diaphoretic in febrile diseases, and in consequence of its insolubility is generally given in pills. Its activity must, I think, be ascribed to the protoxide which it contains, for in the dose of four or six grains it sometimes excites perspiration, and acts with more or less energy on the bowels. Its occasional inertness is easily accounted for, and accordingly it has been given in doses of a hundred grains and upwards without effect; this was probably mere bone-earth, or at all events an antimonial powder deficient in protoxide; but from such instances we are not to infer that antimonial powder is always inert; on the contrary, it sometimes proves virulently emetic from accidental redundancy of the protoxide.

I have spoken above of the advantage of substituting tartarised antimony for this preparation, of which from one eighth to one fourth of a grain will generally be found equivalent to from five to ten grains of the "pulvis antimonialis." In the administration of antimonials peculiarities of habit remarkably interfere with their effects, and a dose of emetic tartar that in one person merely acts upon the skin and bowels in a gentle and agreeable way, shall in another exhibit itself with alarming activity, producing vomiting and purging, excessive depression of strength and of spirits, syncope, and lasting nausea.

Opium and other narcotics are often advantageously combined with antimonials, where allaying pain and exciting the action of the cuticular vessels are the indications to be fulfilled.

℞ Opii pulver. gr. j.
Pulveris Antimonialis gr. iij.
Confect. Rosæ Gallicæ q. s. ut fiat pilula quartâ vel sextâ quâque horâ sumenda cum haustu salino communi.

A mixture of antimonial powder, calomel, and opium, is often effectual in allaying the most urgent symptoms of acute rheumatism, especially after the bowels have been freely evacuated.

℞ Pulver. Antimonialis 3ss.
Hydrargyri Submuriatis gr. v.
Opii pulver. gr. x.
Misce optimè et adde Confectionis Rosæ Gallicæ q. s. ut fiant pilulæ decem, quarum capiat unam sextâ quâque horâ, superbibendo
Misturæ Camphoræ fort. (p. 47) f 3x.

In these formulæ, as a substitute for the *pulvis antimonialis* of the Pharmacopœia, I should recommend the following with a view to obviate all uncertainty :—

℞ Antimonii Tartarisati, gr. viij.
Pulv. Gum. Acaciæ,
Cretæ præparatæ, ää 3j.

Of this powder sixteen grains may be said to contain one grain of tartarised antimony, and from two to four grains will be the average dose for the fulfilment of those indications which are generally expected from four to eight grains of common antimonial powder. In preparing it, the crystals of tartarised antimony should first be reduced to very fine powder, and the other ingredients added by little at a time during constant trituration, with a view of insuring perfect uniformity and mixture.

Various propositions have been made for preparing antimonial powder in the humid way: that suggested by Mr. Chenevix furnishes a much more active compound than either James's powder or the preparation of the Pharmacopœia, but it would be easy so to adjust the component parts as to obviate this objection; the precipitate is, however, also apt to become horny or gritty and difficult to powder, and under any circumstances it appears to offer no advantage that compensates for the trouble and expense of the process.

A PREPARATION OF SILVER.

Argenti Nitras. — *Nitrate of Silver.*

℞ Argenti unciam,
Acidi nitrici fluidunciam,
Aquæ destillatæ fluiduncias duas;

Acidum nitricum Aquâ misce, et in his Argentum balneo arenæ liqua. Dein calorem paulatim auge, ut siccetur Argenti Nitras. Hanc in crucibulo, lento igne, liquefac, donec, expulsâ Aquâ, cessaverit ebullitio; tum statim effunde in formas idoneas.

Take of Silver, an ounce,
Nitric Acid, a fluid ounce,
Distilled Water, two fluid ounces;

Mix the Nitric Acid with the Water, and dissolve the Silver in the mixture in a sand-bath. Then increase the heat gradually, that the Nitrate of Silver may be dried. Melt this in a crucible over a slow fire, until, the Water having been expelled, the ebullition ceases; then pour it immediately into proper moulds.

In this process the silver is oxidized at the expense of one portion of the acid; nitrous gas is therefore evolved, and the resulting oxide of silver, (composed of 110 silver + 8 oxygen = 118,) combining with the other portion of the acid, yields, on evaporation, colourless prismatic crystals of nitrate of silver, which are anhydrous, and consist of—

1 proportional of Nitric Acid	54.	31.4
1 ——————— Oxide of Silver	118.	68.6
	172	100

For internal use this salt ought to be kept in crystals, but the above formula directs the immediate evaporation of the solution to dryness, and the fusion of the dried salt, which is then cast into moulds for surgical use; and it is in this state only that it is usually found in apothecaries' shops.

It is better in all cases to crystallize the nitrate of silver, and carefully to fuse the crystals in a silver crucible over a lamp: the mould in which the sticks are cast should be warmed, to prevent the too rapid cooling of the fused salt, which then

becomes extremely brittle; and care should be taken to employ no more heat than is requisite for its liquefaction, since it easily suffers decomposition and becomes black from the deposition of oxide of silver. The silver employed should be free from copper, and the acid should be pure, in which case the resulting solution is clear and colourless; a little black powder frequently separates, which is gold. This salt of silver is eminently susceptible of the agency of light, which blackens and decomposes it.

The principal use of nitrate of silver is as a caustic; it kills the parts to which it is applied, and being much less soluble than pure potassa, and not deliquescent, it is easier of application and less apt to spread. Distilled water at 60° dissolves about its own weight of this salt: the solution should be transparent and colourless; if of a bluish tinge, and becoming deep blue on the addition of ammonia, it contains copper. It may thus be used in any state of dilution, and is a very valuable application in many cases of ulcerating sores, in the proportion of from one to five grains to the ounce of distilled water. The part may be touched twice or thrice a day with a camel-hair pencil dipped in this solution, which should be of such strength as to occasion smarting. In fistulous sores it is sometimes used as an injection, and it has been recommended as a mouth-wash in scorbutic affections of the gums, and aphthæ of the fauces.

As an internal remedy nitrate of silver has gained much and apparently deserved celebrity in the treatment of epilepsy. In this disease it has been administered in doses beginning with an eighth of a grain and carried up to four or six grains three or four times a day; it is usually taken made into pills with bread-crumb, and the best dose appears to be half a grain thrice a day, gradually increased to a grain and a half or two grains. Under this treatment the fits often decrease at first in violence, and then in frequency, until the patient recovers, and where the bowels are moderately acted upon the efficacy of the remedy appears most certain*. There is a very disagreeable effect which frequently follows this use of nitrate of silver, which is the discoloration of the *rete mucosum*, so that the whole surface

* Med. Chir. Trans. vol. ix. p. 234.

of the body, and especially those parts which are most exposed to light, acquire a leaden-grey or livid colour which is permanent *. Various means have been resorted to with a view of preventing this effect, or of removing it when it has taken place, but hitherto without success. It is curious that excessive acidity at the stomach is a frequent concomitant of epilepsy, and that Dr. Prout's experiments † have shewn that the free acid of the stomach is the muriatic, an acid the base of which would instantly decompose the nitrate of silver.

Nitrate of silver has occasionally been resorted to in other diseases attended by morbid nervous excitement and debility; in certain convulsive affections, in chorea, and in *angina pectoris*.

When taken in overdoses it operates in the same manner as the other corrosive poisons; perhaps the best antidote consists in copious draughts of salt and water, by which chloride of silver would be formed, a compound, in all probability, nearly if not quite inert. Orfila's results, however, in reference to this counter-poison, were not very satisfactory ‡.

PREPARATIONS OF ARSENIC.

Arsenicum Album Sublimatum. — *Sublimed White Arsenic.*

Arsenicum album in pulverem tere; tum conjice in crucibulum, et, admoto igne, in crucibulum aliud priori superimpositum sublima.

Reduce white Arsenic to powder, then put it into a crucible, and expose it to fire, so as to sublime it into another crucible inverted over the former.

If arsenic be purchased in lumps, as it usually occurs in commerce, this process is scarcely necessary; when sold in the form of powder it is sometimes adulterated, and then it may doubtless be purified by sublimation, but it is not easy to

* Albers and Roget, Med. Chir. Trans., vol. vii. p. 284.

† Phil. Trans. 1823.

‡ Traité des Poisons, tom. i. part ii. p. 46.

perform this process according to the directions given above; it is best effected by introducing the white arsenic into a coated glass retort, into the neck of which it may be sublimed by a moderate red heat, and afterwards removed by cutting off the bulb. A large Florence flask placed in a sand heat also answers the purpose extremely well.

After what has been said above (p. 29) we have little to add here upon the subject of arsenic and its preparations; the reader need only be reminded that the adulteration of white arsenic may be detected by heating a little of it in a crucible, when it should be entirely volatilised at a dull red heat; chalk, gypsum, sulphate of baryta, and other fixed substances with which it may have been mixed, remain behind.

Liquor Arsenicalis.

℞ Arsenici albi sublimati, in pulverem subtilissimum triti,
Potassæ Subcarbonatis ex Tartaro, singulorum, grana sexaginta quatuor,
Spiritûs Lavandulæ compositi fluidrachmas quatuor,
Aquæ destillatæ octarium;

Arsenicum album et Potassæ Subcarbonatem coque cum Aquâ in vase vitreo, donec Arsenicum omne liquetur. Liquori frigefacto adjice Spiritum Lavandulæ compositum. Denique adjice insuper Aquæ destillatæ quantum satis sit, ut mensuram octarii accuratè impleat.

Arsenical Solution.

Take of sublimed white Arsenic in very fine powder,
Subcarbonate of Potassa from Tartar, of each sixty-four grains,
Compound Spirit of Lavender, four fluid drachms,
Distilled Water, a pint;

Boil the white Arsenic and the Subcarbonate of Potassa with the Water in a glass vessel, until the whole of the Arsenic is dissolved. When the solution is cold, add the compound Spirit of Lavender. Lastly, add to the whole as much distilled Water as may be requisite to make it exactly fill a pint measure.

This is a solution of arsenite of potas s and subcarbonate of potassa, in distilled water, coloured by compound spirit of lavender. The common subcarbonate of potassa is generally nearly as pure as that obtained by the calcination of tartar; the latter, therefore, is unnecessarily selected. If *pure* subcarbonate of potassa be required, it is easily procured by heating

the carbonate to redness, in a silver crucible; but the usually occurring impurities do not in the least interfere with the activity of this arsenical solution. It contains in the fluid ounce four grains of white arsenic, and is administered in the cure of obstinate intermittents in the dose of from four to twelve or fifteen minims, three or four times a day, in the intervals of the febrile paroxysms. (*See also page* 30.)

℞ Liquoris Arsenicalis ♏iv.
Aquæ destillatæ f℥j.
Spiritûs Cinnamomi,
Syrupi Zingiberis, āā f℥j.
M. fiat haustus sextâ quâque horâ capiendus.

Sometimes it gripes the bowels and irritates the stomach, unless conjoined with aromatics and small doses of opium.

℞ Confectionis Aromaticæ ℈j.*
Aquæ Menthæ sativæ f℥j.
Tincturæ Opii,
Liquoris Arsenicalis, āā ♏vj.
M. fiat haustus ter quotidie sumendus.

There are other disorders in which arsenic has been administered internally: it has cured obstinate intermittent headachs; it has removed cuticular eruptions of long standing, and yielding to no other internal or external remedy; it is also said to have been of service in epilepsy and in tetanus; but evidence much more direct and extended is requisite to justify such employment of so dangerous a poison.

A PREPARATION OF BISMUTH.

Bismuthi Subnitras.	*Subnitrate of Bismuth.*
℞ Bismuthi unciam, Acidi nitrici fluidunciam cum semisse, Aquæ destillatæ octarios tres;	Take of Bismuth an ounce, Nitric Acid, a fluid ounce and a half, Distilled Water, three pints;

* The chalk in the aromatic confection does not interfere with the activity of the *liquor arsenicalis*.

Aquæ destillatæ fluidrachmas sex cum Acido nitrico misce, et Bismuthum in his liqua: tum cola. Aquæ quod reliquum est liquori colato adjice, et sepone ut subsidat pulvis. Deinde effuso liquore supernatante, Bismuthi Subnitratem Aquâ destillatâ ablue, et chartâ bibulâ involutam, leni calore exsicca.

Mix six fluid drachms of the distilled Water with the nitric Acid, and dissolve the Bismuth in this mixture; then filter. Mix the remaining Water with the filtered solution, and set it by, that the powder may subside. Then having poured off the supernatant liquor, wash the Subnitrate of Bismuth with distilled Water, and dry it, wrapped in bibulous paper, in a gentle heat.

Bismuth is susceptible of only one degree of oxidizement; this it suffers when exposed to the joint action of heat and air, throwing off yellow fumes, composed of—

1 proportional of Bismuth	= 71	89.8
1 ——— Oxygen	= 8	10.2
	79	100

When bismuth is dissolved in nitric acid sparingly diluted, it forms a colourless transparent liquor, from which prismatic crystals of *nitrate of bismuth* are deposited; if these, or the nitric solution, be acted upon by a large proportion of water, they are decomposed, and a fine white powder is thrown down, which is a *subnitrate:* its composition has not been accurately determined: it is the *magistery of bismuth* of the old pharmaceutical chemists, and has long been employed as a pigment under the name of *Spanish white.* It is tasteless, and insoluble in water. It has been used as a tonic and sedative in certain cases of dyspepsia attended by pain and spasm *. The best form for its use is that of a pill, with bread crumb. Four grains may at first be taken thrice a day, and the dose gradually augmented to twelve or fifteen grains. From the observations of Orfila †, it would appear that in large doses this substance proves an acrid poison: he

* Bardsley. Med. Reports, 1807.—Yeats. Quarterly Journal, vol. viii. p. 295.

† Traité des Poisons, tom. i. 2me partie, p. 60.

repeats the absurd assertion that the English bakers whiten their bread with it.

PREPARATIONS OF COPPER.

Cuprum Ammoniatum.

℞ Cupri Sulphatis unciam dimidiam,

Ammoniæ Subcarbonatis drachmas sex;

Tere simul in mortario vitreo, donec cessaverit ebullitio; deinde Cuprum ammoniatum, chartâ bibulâ involutum, leni calore exsicca.

Ammoniated Copper.

Take of Sulphate of Copper, half an ounce,

Subcarbonate of Ammonia, six drachms;

Rub them together in a glass mortar until the effervescence shall have ceased; then dry the ammoniated Copper, wrapped in bibulous paper, by a gentle heat.

The compound obtained by this process has a rich blue colour; its odour is generally ammoniacal and its taste saline and styptic. Subsulphate of copper, sulphate of ammonia, and carbonate of ammonia and copper, are among its usual constituents; and when it has been dried at a very low heat, and not unnecessarily exposed to air, the proportion of carbonate of ammonia which it retains is often considerable.

This preparation of copper is generally placed by writers on the Materia Medica in the list of tonics and antispasmodics, but it has little claim to either of those characters. It has been recommended in epilepsy, and is among the remedies which are usually tried in hopeless cases of that disorder: from one to five grains are given three times or twice a day, in the form of pill; there are, however, very few practitioners who place any confidence in its powers, and it is certainly not well adapted for internal use; small doses of sulphate of copper are preferable.

Mr. Thomson and Dr. Paris both say that ammoniated copper has been given with advantage in chorea, after a course of purgatives; but in this disease sulphate of copper, sulphate of zinc, vegetable antispasmodics, and musk, and sometimes cold bathing and affusion, are remedies more to be

depended on. There appears, on the whole, no good reason for retaining "*cuprum ammoniatum*" in the Pharmacopœia.

Liquor Cupri Ammoniati.

℞ Cupri ammoniati drachmam,
Aquæ destillatæ octarium;
Liqua Cuprum ammoniatum in Aqua, et per chartam cola

Solution of Ammoniated Copper.

Take of ammoniated Copper, a drachm,
Distilled Water, a pint;
Dissolve the ammoniated Copper in the Water, and filter through paper.

This solution is stimulant and astringent, and is among the numerous applications which sometimes induce indolent ulcers to assume healthy actions, and ultimately cleanse and heal them; but it frequently proves mischievously irritating. It appears to possess no advantage over a solution of sulphate of copper, and that is often a valuable remedy (p. 74). To say nothing of the uncertain composition of the *cuprum ammoniatum* itself, the solution directed above is open to a serious objection, arising out of the decomposition which that compound of copper suffers when dissolved in a large quantity of water; it occasions the separation of oxide of copper. Solution of ammoniated copper has also been extolled as a stimulant for the cornea, where it is threatened with specks and opacity; but here again the sulphate of copper is a preferable application.

PREPARATIONS OF IRON.

Ferrum Ammoniatum.

℞ Ferri Subcarbonatis,
Acidi muriatici,
Ammoniæ Muriatis, singulorum libram;

Ammoniated Iron.

Take of Subcarbonate of Iron,
Muriatic Acid,
Muriate of Ammonia, of each, a pound;

Ferri Subcarbonati superinfunde Acidum muriaticum, et sepone donec bullulæ non ampliùs excitentur. Liquorem per chartam cola, et colatum decoque donec omnis humor consumptus sit. Quod restat, cum Ammoniæ Muriate diligenter misce: tum igne acri subjecto protinùs sublima: denique in pulverem tere.

Pour the muriatic Acid upon the Subcarbonate of Iron, and set it by until the effervescence has ceased Filter the solution through paper, and evaporate it to dryness. Mix the residue well with the Muriate of Ammonia, and sublime them immediately in a strong fire: then powder the sublimate.

This preparation of iron is a very useless incumbrance to the Pharmacopœia, and is never prescribed by those physicians who are acquainted with the chemical properties of the remedies which they exhibit. As, however, the formula is retained, it will be right to make some further remarks upon it. The first part of the process directs the formation of a pure chloride of iron, for which, however, the proportion of oxide (subcarbonate) used is unnecessarily large: this is to be mixed and sublimed with the muriate of ammonia, and the resulting sublimate, composed of muriate of ammonia and perchloride of iron, is ultimately to be powdered for use.

If any peculiar medical virtues belonged to a mixture of perchloride of iron and muriate of ammonia, it might easily and certainly be prepared by mixing the muriate of ammonia with a solution of permuriate of iron, and evaporating to dryness: in this way there would be no risk of decomposing either substance, and the process of sublimation (which is useless) would be altogether avoided. Or, a still less objectionable process would consist in mixing, in the requisite proportions, sublimed perchloride of iron with muriate of ammonia.

Under the names *flores martiales*, *ens martis*, *flores auri*, and *calendulæ minerales*, this compound has very long been used as a deobstruent and tonic alterative; and as it contains a very efficient preparation of iron, the praises that have been bestowed upon it are perhaps not altogether groundless. It is among the remedies which have been prescribed with success in epilepsy, and a variety of other nervous affections, and has been especially extolled as a tonic for children of scrofulous and rickety habits: in these cases, six to ten grains are given three or four times a day, to adults; and to children rather less than half that quantity. It may be administered

in pills, in electuary, or in solution; but the *tinctura ferri muriatis* is, in all cases, a proper substitute, to which muriate of ammonia is easily added by those who attribute any additional efficacy to the combination.

Ferri Subcarbonas.

℞ Ferri Sulphatis uncias octo,

Sodæ Subcarbonatis uncias sex,

Aquæ ferventis congium;

Ferri Sulphatem et Sodæ Subcarbonatem separatim liqua in Aquæ octariis quatuor; tum liquores inter se misce, et sepone, ut pulvis subsidat; deinde, effuso liquore supernatante, Ferri Subcarbonatem Aquâ calidâ ablue, et chartâ bibulâ involutam leni calore exsicca.

Subcarbonate of Iron.

Take of Sulphate of Iron, eight ounces,

Subcarbonate of Soda, six ounces,

Boiling Water, a gallon;

Dissolve the Sulphate of Iron and the Subcarbonate of Soda separately in four pints of the Water; then mix the solutions and set them by, that the powder may subside; then having poured off the supernatant liquor, wash the subcarbonate of Iron with hot Water, and dry it on bibulous paper by a gentle heat.

When a solution of protosulphate of iron is thus mixed with one of carbonate of soda, a double decomposition ensues, and a hydrated protocarbonate of iron is thrown down of a green colour, sulphate of soda remaining in solution. When the hydrated protocarbonate of iron formed in the first instance is exposed to air, and dried in a gentle heat, it loses water and carbonic acid, and acquires oxygen: its green colour is at the same time changed to a rich reddish brown, and in this state it constitutes what is above termed "subcarbonate of iron:" it is, however, in fact, a peroxide of iron, retaining a variable, but generally very small proportion of carbonic acid. The only form in which carbonate of iron can be conveniently administered is in the humid form, as originally precipitated, and in this state it exists in the "*mistura ferri composita.*"

Peroxide of iron, however, prepared as above, is obtained

in a very finely divided state, and is a useful chalybeate. It is inodorous, insipid, and insoluble in water: generally, therefore, administered in powder or pill, combined with bitters and aromatics, where it is merely intended as a tonic; and with aloetics, valerian, and myrrh, when directed more immediately to the uterine system. It may be given in doses of from five to twenty grains, twice or thrice a day.

℞ Ferri Subcarbonatis gr. x.
Pulveris Cinnamomi compos. gr. v.
M. fiat pulvis mane et meridie sumendus.

℞ Ferri Subcarbonatis,
Extracti Anthemidis, āā 3ss.
Misce et divide in pilulas xij. quarum sumat binas ter quotidie.

℞ Ferri Carbonatis gr. x.
Pulveris Valerianæ 3ss.
Syrup. Zingiberis, q. s.
Fiat bolus. [*Paris.*]

℞ Ferri Carbonatis 3j.
Pilul. Aloes c. Myrrhæ 3ss.
M. et divide in pilulas xviij. duæ bis terve in die sumendæ.

In large doses, this preparation of iron has been recommended by Mr. Hutchinson in the treatment of *tic douloureux*. He administers it in doses of from half a drachm to a drachm, twice or three times a day.—(See *Ferrum*, in the Materia Medica, p. 85.)

Prepared rust of iron, and the red oxide (formerly called *colcothar*, or *caput mortuum vitrioli*) remaining after the decomposition of sulphate of iron at high temperatures, together with several other varieties of the peroxide of this metal, were once directed in the Pharmacopœia; these have very properly given place to the present subcarbonate, which is an adequate substitute.

According to the best analyses, the peroxide of iron is composed of—

Iron.....	70
Oxygen	30
	100

These numbers correspond with two proportionals of metal to three of oxygen; or with—

1	proportional of Iron ..... =	28
$1\frac{1}{2}$	——— Oxygen ..... =	12
		40

Ferri Sulphas.

℞ Ferri,
Acidi sulphurici, singulorum *pondere* uncias octo,
Aquæ octarios quatuor;

Acidum sulphuricum cum Aqua in vase vitreo misce, hisque adjice Ferrum; tum, ubi bullulæ exire cessaverint, liquorem per chartam cola, eumque ad ignem consume, adeò ut, dum frigescit, fiant crystalli. Has, effuso liquore, super chartam bibulam exsicca.

Sulphate of Iron.

Take of Iron,
Sulphuric Acid, of each, *by weight*, eight ounces,
Water, four pints;

Mix the sulphuric Acid with the Water in a glass vessel, and add the Iron to them; then, when bubbles have ceased to escape, filter the solution through paper, and evaporate it so that crystals may form when it cools. Having poured off the liquor, dry these upon bibulous paper.

Iron has scarcely any action upon concentrated sulphuric acid at common temperatures, but upon the diluted acid it acts with great energy, the metal becomes protoxidized, and hydrogen gas is evolved, entirely at the expense of the water present, while the acid and oxide combine, and give rise to the production of a *protosulphate of iron*, which, by evaporating the filtered solution, is obtained in rhombic crystals, of a green colour, an extremely styptic taste, and soluble in

about twice their weight of water at 60°. When exposed to air, they effloresce, and acquire a yellow colour, in consequence of the absorption of oxygen by the metallic protoxide.

Protoxide of iron consists of—

1 proportional of Metal	= 28	....	77.55
1 ——————— Oxygen.....	= 8	.....	22.45
	36		100

Dry protosulphate of iron is composed of—

1 proportional of Protoxide of Iron.....	= 36	.....	47.2
1 ——————— Sulphuric Acid	= 40	.....	52.8
	76		100

and the crystallised salt contains—

1 proportional of dry Protosulphate....	= 76	.....	54.7
7 ——————— Water..... 9 × 7	= 63	.....	45.3
	139		100

When this salt is exposed to a moderate heat it loses water, and crumbles down into a white powder: distilled at a red heat, it suffers a complete decomposition; water is first evolved, then sulphurous acid and oxygen, and then sulphuric acid, partly anhydrous, and formerly known under the name of *glacial oil of vitriol*, from its property of solidifying at common temperatures *. The residue in the retort is peroxide of iron, formerly called *colcothar*, or *caput mortuum vitrioli*.

Vitriol of Mars, *green vitriol*, *copperas*, and *sal Martis*, are names by which this salt of iron was formerly known. It is of much importance in many of the arts, and a valuable chalybeate for medical use.

Sulphate of iron is not conveniently administered in solution, in consequence of the facility with which it is in that

* Bussy, Quarterly Journal, vol. xviii. p. 145.

state decomposed: it is commonly given in pills, conjoined with aromatics to prevent its griping. The usual dose is from one to three grains, where chalybeates are indicated; if it nauseates and occasions spasmodic pains of the stomach and bowels, it is generally prudent to desist from its use, and resort to some other form of iron.

As a tonic in scrofulous habits, it may be given with a course of bark.

℞ Ferri Sulphatis ℈j.
Extract. Cinchonæ 3j.
Divide in pilulas xv. una ter in die sumenda.

In amenorrhœa, with bitter extracts, or with myrrh.

℞ Ferri Sulphatis gr. xij.
Extracti Gentianæ 3j.
Pulveris Cinnamomi compositi 3ss.
Fiat massa in pilulas xviij. dividenda, quarum capiat ægra duas ter in die, superbibendo haustum infusi alicujus amari. [*Hooper.*]

℞ Ferri Sulphatis ℈j.
Pulv. Myrrhæ 3j.
Syrup. Simpl. q. s.
Fiat massa in pilulas xij. distribuenda. Sumatur una ter die.

The propriety of administering this and other preparations of iron, with vegetable astringents, has often been called in question; and they have been said to be incompatible with it, because they form inky mixtures: this arises generally from the production of a *tanno-gallate of iron*, which may nevertheless be, and I believe is a good and effective chalybeate. It has already been said that infusion of quassia may be administered with the salts of iron, without any ensuing decomposition; so may infusion of calumba: those bitters therefore are perhaps preferable in cases where iron is given in solution, to those which contain astringent matter.

As an external application, sulphate of iron is of doubtful value. Its solution has been applied to cancerous sores and

ill-conditioned ulcers*. It has also been used in *fluor albus* in the proportion of ʒiv. dissolved in f℥viij. of distilled water.

Ferrum Tartarizatum.

℞ Ferri libram,
Potassæ Supertartratis contritæ libras duas,
Aquæ destillatæ octarios quinque, vel quantum satis sit;

Ferrum et Potassæ Supertartratem simul tere, et in vase vitreo patulo cum Aquæ octario per dies viginti aëri expone, quotidie agitans, adjectâ subindè Aquâ destillatâ ut semper humida sint. Dein cum Aquæ destillatæ octariis quatuor coque per quadrantem horæ, et cola. Liquorem balneo aquoso consume donec Ferrum tartarizatum penitùs exsiccatum sit. Hoc in pulverem tere, et vase bene obturato serva.

Tartarised Iron.

Take of Iron, a pound,
Supertartrate of Potassa, in powder, two pounds,
Distilled Water, five pints, or a sufficient quantity;

Triturate the Iron and the Supertartrate of Potassa together, and expose them to the air with a pint of the Water in a shallow glass vessel for twenty days, stirring them daily, and occasionally adding distilled Water, so that they may be always moist. Then boil them in four pints of the distilled Water for a quarter of an hour, and filter. Evaporate the filtered liquor in a water-bath, until the tartarised Iron becomes quite dry. Reduce this to powder, and keep it in a well-stopped vessel.

The first part of this process is calculated to furnish a good preparation of iron, but the boiling and evaporation to dryness partly decompose the original product, and the "ferrum tartarizatum" ultimately obtained is a product very rarely prescribed, and of little use. It is, however, a considerable improvement upon the formula of the last Pharmacopœia.

Ferrum tartarizatum, which is in fact a *pertartrate of iron and potassa*, should be prepared in solution. According to Mr. R. Phillips†, sixty-four parts of tartar are capable of dissolving fifteen parts of iron-filings when exposed and moistened as above directed. The moist mass may be digested

* Edinb. Med. and Surg. Journal, vol. ii. p. 373.

† Experimental Examination of the Pharm. Lond. 1811.

in seven times its weight of water, and the solution filtered: it contains about an eighth of its weight of tartarised iron, and as it is nearly tasteless, it may sometimes perhaps be useful, especially for children.

The tartarised iron of the Pharmacopœia may be used in the form of pills; it becomes too moist by exposure to air to be conveniently employed as an ingredient in powders, but it may be prescribed in solution, and is not very easily decomposed by many of those substances which are incompatible with the simple salts of iron. The usual dose is from ten to twenty grains. It does not appear to possess any distinct diuretic power, which has sometimes been attributed to it; but like other chalybeates it may be conjoined, as a tonic, with the diuretic remedies generally prescribed in dropsical affections.

Several preparations of iron corresponding in some measure with the above are found in all dispensatories, such for instance as the *tinctura Martis aperiens* of Glauber, and the *tinctura ferri cydoniata, citrata, aurantiaca, pomata,* &c. The *tinctura acetatis ferri* of the Dublin Pharmacopœia may also be mentioned here; but all these preparations have been very properly put aside as useless; a *liquor ferri tartarisati* might have been conveniently retained as their general substitute.

Liquor Ferri Alkalini.

℞ Ferri drachmas duas cum semisse,
Acidi nitrici fluiduncias duas,
Aquæ destillatæ fluiduncias sex,

Liquoris Potassæ Subcarbonatis fluiduncias sex;

Ferro superinfunde Acidum et Aquam inter se mista; tum, ubi bullulæ exire cessaverint, liquorem adhuc acidum effunde. Hunc, paulatim et ex intervallis, Liquori Potassæ Subcarbonatis adjice, subindè

Solution of Alkaline Iron.

Take of Iron, two drachms and a half,
Nitric Acid, two fluid ounces,
Distilled Water, six fluid-ounces,
Solution of Subcarbonate of Potassa, six fluid ounces;

Pour the Acid and Water, previously mixed, upon the iron; then, when bubbles have ceased to escape, pour off the acid liquor; add this gradually and at intervals to the solution of Subcarbonate of Potassa,

agitans, donec, facto jam colore fusco-rubicundo, bullulæ nullæ ampliùs excitentur. Denique sepone per horas sex, et liquorem effunde.

occasionally stirring, until, it having assumed a brown-red colour, effervescence is no longer excited. Lastly, set it aside for six hours, and pour off the solution.

"It is a very injudicious preparation; for it cannot be exhibited in any form without decomposition." We entirely agree with Dr. Paris in the first part of this opinion; and that practitioners generally are of the same mind is evident, inasmuch as they never prescribe it, a circumstance alone amply sufficient to have justified its omission from the present edition of the Pharmacopœia. It is not, as sometimes represented, Stahl's *tinctura Martis alkalina*, nor have I been able to ascertain who is the author of the formula.

In respect to the chemical composition of this "liquor ferri alkalini," I refer the reader to Mr. R. Phillips*, who has thrown all the light upon the subject that it seems to admit of, especially in his elaborate remarks upon the subject in the "Experimental Examination" published in 1811.

Tinctura Ferri Ammoniati. — *Tincture of Ammoniated Iron.*

℞ Ferri ammoniati uncias quatuor,
Spiritûs tenuioris octarium;
Macera, et cola.

Take of Ammoniated Iron, four ounces,
Proof Spirit, a pint;
Digest, and filter.

The term "liquor ferri ammoniati" would perhaps have been more applicable to this solution of *ferrum ammoniatum* in diluted alcohol. As its active ingredient is of very uncertain composition and of very doubtful efficacy, the only remark which we have to make upon the above tincture is

* Trans. of the London Pharmacopœia, p. 103.

the impropriety of retaining it, in consequence of its variable strength. Mr. Phillips examined three samples of it from different sources, and found that the strongest contained less than four grains of peroxide of iron in a fluid ounce and a half; and the weakest, little more than one grain in the same bulk. It should be a leading object with the compilers of a Pharmacopœia to reject all uncertain and comparatively useless formulæ. The *tinctura ferri ammoniati* might safely have been left for the extemporaneous prescription of such as put faith in its virtues.

Tinctura Ferri Muriatis. — *Tincture of Muriate of Iron.*

R Ferri Subcarbonatis libram dimidiam, Acidi muriatici octarium, Spiritûs rectificati octarios tres;	Take of Subcarbonate of Iron half a pound, Muriatic Acid, a pint, Rectified Spirit, three pints;
Ferri Subcarbonati superinfunde Acidum in vase vitreo, et per triduum subindè agita. Sepone, ut fæces, si quæ sint, subsidant; dein liquorem effunde, eique adjice Spiritum.	Pour the Acid upon the Subcarbonate of Iron in a glass vessel, and shake the mixture occasionally for three days. Set it by, so that the dregs, if any, may subside; then pour off the liquor, and add the Spirit to it.

This is an unexceptionable process for preparing one of the most valuable chalybeates of pharmacy. The specific gravity of the solution should be about 998 to 1000, and the fluid ounce should contain about thirty-four grains of peroxide of iron. It has a slightly ethereal odour, a deep olive-yellow colour, and very astringent taste. It is not liable to spontaneous changes, which is the case with many of the other preparations of iron, especially those which contain the protoxide.

As a tonic, from five to thirty drops may be taken twice a day in a wine-glass of water. In dyspepsia small doses are

generally more serviceable than large ones, and it may be given in any bitter infusion, those being generally selected which are not blackened by it.

℞ Tincturæ Ferri Muriatis ℥vj.
Infusi Quassiæ,
Aquæ Cinnam. ää f℥vj.
Tincturæ Calumbæ, f℥j.
M. fiat haustus mane et meridie sumendus.

The dose may gradually be augmented if necessary to thirty drops, but it is apt in larger doses to produce headach, to harden the pulse, and occasion slight spasmodic pains of the stomach and bowels. If it constipates, a drachm of sulphate of magnesia may be added to each draught. If it produces diarrhœa, the bowels should be cleared with a little rhubarb and magnesia, and it may then be resumed generally without ill effect.

As a tonic after diseases of debility or depletion of the system, it requires, as well as the other preparations of iron, considerable circumspection in its use; if it induces no local inflammatory action or headach, and neither hardens the pulse, nor materially quickens it, it often proves eminently active in restoring tone to the constitution.

With aloetics and antispasmodics it is not an ineffective emmenagogue, though not upon the whole so well calculated to fulfil this particular indication as some of the other chalybeates. It may be given as follows:

℞ Tinct. Ferri Muriatis,
Tinct. Aloes compos.
Tinctur. Valerianæ, ää f℥ss.
M. sumatur cochleare unum minimum ex infusi anthemidis cyatho, bis vel ter quotidie.

Like other chalybeates it sometimes expels worms from the intestines. It is used as a styptic in internal hæmorrhages. In scrofulous affections it is a most valuable tonic, especially when it can be given in large doses. Mr. Thomson

recommends the dose in these cases to be gradually increased up to 120 drops twice a day.

In retention of urine depending upon spasmodic stricture of the urethra, this solution of iron has been represented as having something like a specific action. Five or six drops have been recommended in such cases by Mr. Cline, every ten minutes until nausea is produced.

As an external application, the "*tinctura ferri muriatis*" has been applied to cancerous and other very ill-conditioned sores, but not with any marked success.

There is a curious preparation of iron known in Germany under the name of "BESTUSCHEFF'S *nervous tincture*," the secret of which was purchased and published by the Empress Catherine of Russia. It has a place in the Parisian Codex under the name of "*tinctura ætherea alcoholica de muriate ferri*," and is sometimes known as "*La Motte's golden drops*." The following is Klaproth's formula for its preparation, from the Prussian Pharmacopœia:—

℞ Ferri pulverati, quantum vis:
Solve in
Acidi Muriatici sufficienti quantitate, cum Acidi Nitrici quarta parte mixta, et evapora. Massam siccam in cellam sepone, ut in liquorem coloris fusci saturati deliquescat.
Liquorem acceptum misce cum
Ætheris Sulphurici duplo, conquassando. Ætherem hoc modo ferro soluto impregnatum, separa, et cum
Spiritûs Vini rectificatissimi duplo misce.
Mixtum in vitris oblongis, bene obturatis, radiis solis tamdiu expone, donec color omnis evanuerit. Tum sollicitè serva.

Vinum Ferri. — *Wine of Iron.*

℞ Ferri drachmam, Potassæ Supertartratis contritæ drachmas sex,	Take of Iron, a drachm, Supertartrate of Potassa, in powder, six drachms,

Aquæ destillatæ octarios duos, vel quantum satis sit,
Spiritûs tenuioris fluiduncias viginti;

Ferrum et Potassæ Supertartratem simul tere, et in vase vitreo patulo cum Aquæ fluiduncià per hebdomadas sex aëri expone, spathâ quotidie movens, adjectâ subinde Aquâ destillatâ ut semper humida sint. Dein leni calore exsicca, in pulverem tere, et cum Aquæ destillatæ fluidunciis triginta misce. Liquorem cola, et colato Spiritum adjice.

Distilled Water, two pints, or a sufficient quantity,
Proof Spirit, twenty fluid ounces;

Rub the Iron and the Supertartrate of Potassa together, and expose the mixture to the air for six weeks, in a shallow glass vessel, with one fluid ounce of the Water, stirring it daily with a spatula, and occasionally adding distilled Water, so that it may be always moist. Then dry by a gentle heat, reduce it to powder, and mix it with thirty fluid ounces of the distilled Water. Filter the solution, and when filtered, add the spirit.

In this, as in the process for "ferrum tartarizatum," mischief is done by drying the pertartrate of iron, a portion of which is thus rendered insoluble: when the spirit is added to the solution, another portion is precipitated, and accordingly there is less iron in the present than in the former *vinum ferri*, in the proportion, according to Mr. R. Phillips, of 16 to 22. But this is a matter of little importance in comparison with the change in the nature of the preparation, which is now so unlike the *steel wine* of all former Pharmacopœiæ. If there be any grounds for preferring a potassa-tartrate to other salts of iron, a vinous preparation may be made by dissolving the moist tartarised iron in white wine, but such a solution, when kept, always suffers more or less decomposition. The following has been proposed as a convenient substitute for old steel wine:—

℞ Tinctur. Ferri Muriatis, f 3j.
Vini albi Hispan. f 3xv. M.

But this mixture either is at first, or becomes turbid from the deposition of tartrate of iron.

Vinous solutions of iron are chiefly intended for the use of children of weak and rickety constitution, especially where a tendency to scrofula is manifest; in such cases a tea-spoonful of

the old *vinum ferri** twice or thrice a day often proves a valuable auxiliary to other remedial means. In these cases alkaline medicines are often properly conjoined with chalybeates; and the only preparation of iron which well admits of combination with the alkaline carbonates, and is not decomposed by them, is the solution of *ferrum tartarizatum:* this, with other reasons, suggests the expediency of introducing a proper solution of that triple salt of iron into the Pharmacopœia, but the old *steel wine* should also be retained.

PREPARATIONS OF MERCURY.

Hydrargyrum cum Creta. — *Mercury with Chalk.*

℞ Hydrargyri purificati *pondere* uncias tres,	Take of Purified Mercury, *by weight,* three ounces,
Cretæ preparatæ uncias quinque;	Prepared Chalk, five ounces;
Tere simul, donec globuli non ampliùs conspiciantur.	Rub them together until globules are no longer visible.

By triturating mercury with chalk, a very small portion of the metal becomes converted into protoxide; the remainder is very minutely divided, and thus, perhaps, acquires some activity as a mercurial when taken into the stomach.

Different opinions are entertained respecting the utility of this mercurial; some practitioners maintain that it has no efficacy, and others consider it as an effective and peculiar, though very mild remedy. There are cases in which *very small doses* of blue pill (a quarter of a grain to a grain) are productive of beneficial effects, and such cases are suited to this preparation, which may be taken in doses from five grains up to twenty or thirty with much the same effect as

* ℞ Limaturæ Ferri, ℥ij.
Vini albi Hispan. oct. ij.
Digere per dies quatuordecim et cola per chartam.

very minute doses of more active preparations of the metal. Otherwise it has no peculiar merits. The beneficial effect of very minute doses of mercury, where the usual mode of administering it produces bad consequences, as is very frequently the case in that stage of dyspepsia which is attended by disordered bilious secretion, has been well pointed out by Dr. W. Philip*. As far as respects the remedy we are now considering, the question to be determined by the practitioner is whether he will prefer giving five to ten grains of *hydrargyrum cum creta* to half a grain or a grain of the *pilula hydrargyri;* he will probably decide in favour of the latter, which is more certain in its action. Upon the principle adverted to it is that *hydrargyrum cum creta* is justly esteemed as a means of correcting the biliary secretion in children, and especially of increasing it when deficient in quantity, and the stools are clay-coloured or white. The extreme mildness, or little comparative activity of this mercurial, generally requires that its use should be continued for some time: the same observation applies to very small doses of blue pill; but the beneficial effects which result are often more permanent than where larger doses are employed; and not unfrequently the latter fail or are only temporarily successful, while the former succeed in restoring a more permanent healthy action.

The chalk in the above preparation plays a very unimportant part: its only effect is that of an antacid, but we have no evidence shewing that mercurials are increased in activity by an acid state of the stomach; and if it were so, the proportion of chalk given in the usual dose of *hydrargyrum cum creta* is too small to be taken into account.

In tabes and atrophia of children, and in some of their cutaneous affections, this mercurial has been preferred to others as an alterative; in these and all other cases the very varying susceptibility of different constitutions to the effects of mercury must not be lost sight of; and when the gums become even very slightly affected, it should either be suspended or the dose diminished.

* Treatise on Indigestion, 4th edit. p. 246.

Hydrargyri Nitrico-Oxydum.	*Nitrico-Oxide of Mercury.*
℞ Hydrargyri purificati *pondere* libras tres, Acidi nitrici *pondere* libram cum semisse, Aquæ destillatæ octarios duos;	Take of Purified Mercury, *by weight*, three pounds, Nitric Acid, *by weight*, a pound and a half, Distilled Water, two pints;
Misce in vase vitreo, et coque, donec liquetur Hydrargyrum, et, Aquâ consumptâ, materia alba restet. Hanc tere in pulverem, et in vas aliud quàm minimè profundum conjice; tum ignem lenem adhibe, eumque paulatim auge, donec vapor ruber prodire cessaverit.	Mix them in a glass vessel, and boil until, the Mercury being dissolved and the Water evaporated, a white substance remains. Rub this to powder, and put it into a very shallow vessel; then expose it to a moderate fire, gradually increased until red vapour ceases to escape.

In the first part of this process a pernitrate of mercury is formed, which is then decomposed by heat. It is very difficult so to apply the heat, as to expel the whole of the acid, without at the same time evolving oxygen from the remaining oxide and evaporating part of the mercury. We find therefore a small portion of nitric acid generally remaining in the compound. The nitrate requires to be constantly stirred during the process, which is generally performed in a cast iron pot: the operator will find it advantageous to prepare the solution and partly to evaporate it in a retort with an annexed receiver containing a little water, by which, if any quantity of materials is employed, he will save a part of the acid.

The resulting nitrico-oxide of mercury is of a brilliant red colour, with a shade of orange; when not in very fine powder it has a glistening scaly appearance; at a red heat it is decomposed and entirely dissipated, provided it be not adulterated, as it sometimes is, with red lead: it has an acrid taste, is very sparingly soluble in water, and readily soluble without effervescence in nitric acid. The proportion of subpernitrate of mercury remaining in this preparation is variable; but some is always to be detected, for when decomposed by heat, the evolved oxygen is found to be mixed with a portion of nitrogen: it therefore should never be used as a substitute

for pure peroxide of mercury. When washed with and triturated in a dilute solution of potassa, edulcorated with distilled water, and carefully dried, it may be regarded as a nearly pure peroxide of mercury. In this state it is called *arcanum corallinum* in some of the older Pharmacopœiæ*.

Nitrico-oxide of mercury is only employed as an external application, either alone, finely levigated, or mixed with ointment.—(See *unguentum hydrargyri nitrico-oxydi.*)

Sprinkled upon the surface of old or indolent sores, it not unfrequently stimulates them to more healthy actions; sometimes it excites excessive irritation, and may then be diluted with two or three parts of starch, flour, or any analogous inert matter. It is sometimes used as an escharotic mixed with powdered savine, burnt alum, and various stimulants; and mixed with eight or ten parts of finely powdered sugar is one of the remedies which some oculists direct to be blown upon the eye for the removal of specks in the cornea.

Hydrargyri Oxydum Cinereum.

℞ Hydrargyri Submuriatis unciam,

Liquoris Calcis congium;

Hydrargyri Submuriatem in Liquore Calcis coque, assiduè movens, donec Oxydum Hydrargyri cinereum subsidat. Hoc Aquâ destillatâ lava; deinde exsicca.

Grey Oxide of Mercury.

Take of Submuriate of Mercury, an ounce,

Lime-Water, a gallon;

Boil the Submuriate of Mercury in the Lime-Water, constantly stirring, until the grey Oxide of Mercury subsides. Wash this with distilled Water; then dry it.

It is scarcely necessary to enter in detail into the objectionable parts of this process, as the preparation which it affords is never used: it may, however, be right to observe, that the action of lime-water upon calomel is very much influenced by the mechanical state of the latter, which, unless in a state of extreme division, is only superficially acted upon:

* Disp. Boruss. Brand. 1731.

a mixture, therefore, of calomel and *black* oxide of mercury is usually found in the shops, under the name of "grey oxide of mercury." Sometimes the decomposition is more complete, and a perfectly black powder is the first result, but this soon changes to an olive colour of variable shades. In this case a very minute portion of metallic mercury makes its appearance, and the superfluous oxygen converts a portion of the *black* into *red* oxide of mercury. The extent to which this change goes, influences the colour of the product, and often leads to the unjust suspicion of the existence of corrosive sublimate in the calomel employed. Although the quantity of lime directed in the process (supposing the lime-water to be good) is more than enough for the decomposition of the calomel, the diluteness of the solution seems to prevent its action, and this is another cause of the presence of unchanged calomel in the product: carbonate of lime will also generally be found in it, obviously derived from the necessary exposure of the lime-water to air.

The indefinite composition of this preparation is sufficient reason for excluding it from pharmacy; the *hydrargyrum cum creta* and the *pilulæ hydrargyri* are substitutes for it, applicable in all cases where protoxide of mercury is required.

A mixture of calomel and lime-water, in variable proportions, has long been used in surgery, under the name of *grey* or *black lotion:* it is often a soothing application to irritable sores and surfaces.

The nature of the mutual action of lime-water and calomel will be found under the head "*hydrargyri submurias.*"

Hydrargyri Oxydum Rubrum. — *Red Oxide of Mercury.*

℞ Hydrargyri purificati *pondere* libram;

Immitte Hydrargyrum in vas vitreum altum, cui os angustum, et fundus latior sit. Vasi huic aperto

Take of purified Mercury, *by weight,* a pound;

Put the Mercury into a tall glass vessel with a narrow mouth and broad bottom. Expose this vessel,

calorum gradûs 600mi adhibe, donec Hydrargyrum in squamas rubras abierit; dein in pulverem subtilissimum tere.

open, to a temperature of 600°, until the Mercury is converted into red scales; then rub them to a very fine powder.

This is the *hydrargyrum præcipitatum per se*, and *hydrargyrum calcinatum* of the older Pharmacopœiæ; the mercury being heated nearly to its boiling point, slowly saturates itself with the oxygen of the air, which is freely admitted, and becomes converted into a peroxide, composed of—

1 proportional of Mercury	= 200	....	92.6
2 ——————— Oxygen ... 8 × 2 =	16	....	7.4
	216		100

It is curious in respect to this oxide, that the range of temperature requisite for its formation falls little short of that which effects its decomposition, for at a dull red heat it gives out the oxygen which it had previously absorbed. It is generally produced in minute scales and crystalline grains of a brilliant crimson colour, which when heated become black, and gradually resume their original hue on cooling. When in fine powder, the colour of this oxide inclines to orange. It has a slightly metallic taste, is sparingly soluble in water, readily soluble in nitric acid, and should be entirely volatilised by a red heat.

The mischievous qualities of this oxide, when taken internally, have already been adverted to (p. 97); and notwithstanding the high authority which once sanctioned its use as an antivenereal remedy, it seems justly laid aside by the most eminent of our present practitioners. It is true that its tendency to nauseate, gripe, and purge may, to a great extent, be prevented by a combination with opium; but all that can in this way be obtained from it, may be derived from other safer mercurials. If ever employed, it should be as an alterative, in very small doses, such as an eighth of a grain night and morning: it has been given, but not without much

danger, and often with decidedly virulent effect, in two and three grain doses.

As an escharotic and stimulant application to sores, it is sometimes employed, as being milder in effect than the nitrico-oxide, and in the same way. For these purposes it should be reduced to the finest state of powder, and either sprinkled in substance upon the diseased surface, or applied in the form of ointment, or diffused through water thickened with a little mucilage of gum arabic.

Hydrargyri Oxymurias.

℞ Hydrargyri purificati *pondere*, libras duas,
Acidi sulphurici *pondere* uncias triginta,
Sodæ Muriatis exsiccatæ libras quatuor;

Hydrargyrum cum Acido sulphurico in vase vitreo coque, donec Hydrargyri Sulphas exsiccata fuerit; hanc, ubi refrixerit, cum Sodæ Muriate in mortario fictili contere; tum ex cucurbitâ vitreâ, calore sensim aucto, sublima.

Oxymuriate of Mercury.

Take of purified Mercury, *by weight*, two pounds,
Sulphuric Acid, *by weight*, thirty ounces,
Dried Muriate of Soda, four pounds;

Boil the Mercury with the sulphuric Acid in a glass vessel, until the Sulphate of Mercury is dry. Rub this, when it is cold, with the Muriate of Soda in an earthenware mortar; then sublime from a glass cucurbit, by heat gradually increased.

The first step in this process is the formation of a dry *persulphate of mercury;* that is, of a salt composed of sulphuric acid and peroxide of mercury, and containing, in its perfect state,—

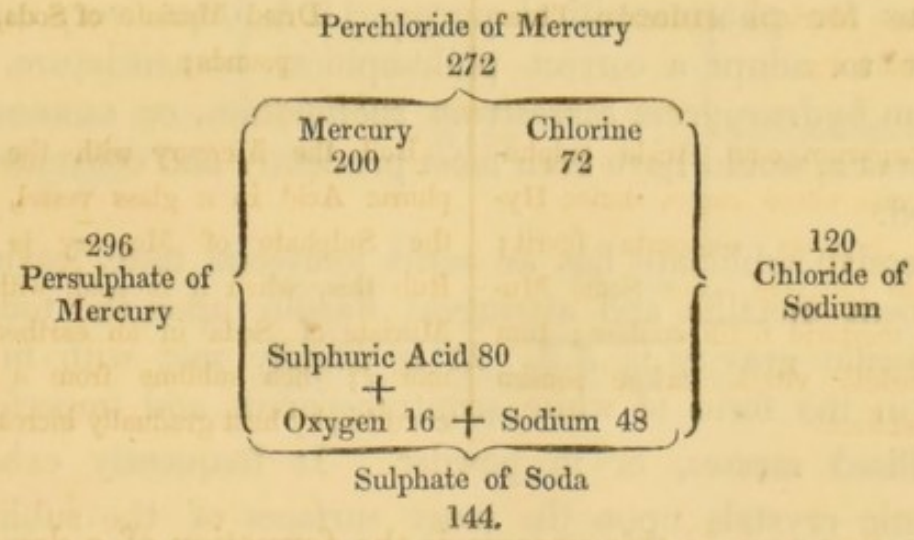
1 proportional of Peroxide of Mercury..	= 216	....	73
2 ——————— Sulphuric Acid.....	= 80	....	27
	296		100

This persulphate is then thoroughly mixed with chloride of

sodium (common salt), called in the above formula *muriate of soda*, which is composed of—

1 proportional of Sodium.....	=	24	40
1 ——————— Chlorine	=	36	60
		60	100

Upon the application of heat to this mixture, the original substances are decomposed, *perchloride of mercury* (oxymuriate of mercury) sublimes, and sulphate of soda is the residue. The object, then, of the operation is to obtain a compound of *one* proportional of mercury and *two* of chlorine, which is effected by the mutual decomposition of *one* proportional of persulphate of mercury, =296, and *two* proportionals of chloride of sodium, $60 \times 2 = 120$, as shewn in the following table:—



The results, therefore, are, *two* proportionals of sulphate of soda, =144, and *one* proportional of perchloride of mercury, =272, consisting of—

1 proportional of Mercury.....	=	200	73.52
2 ——————— Chlorine..... 36 × 2 =		72	26.48
		272	100

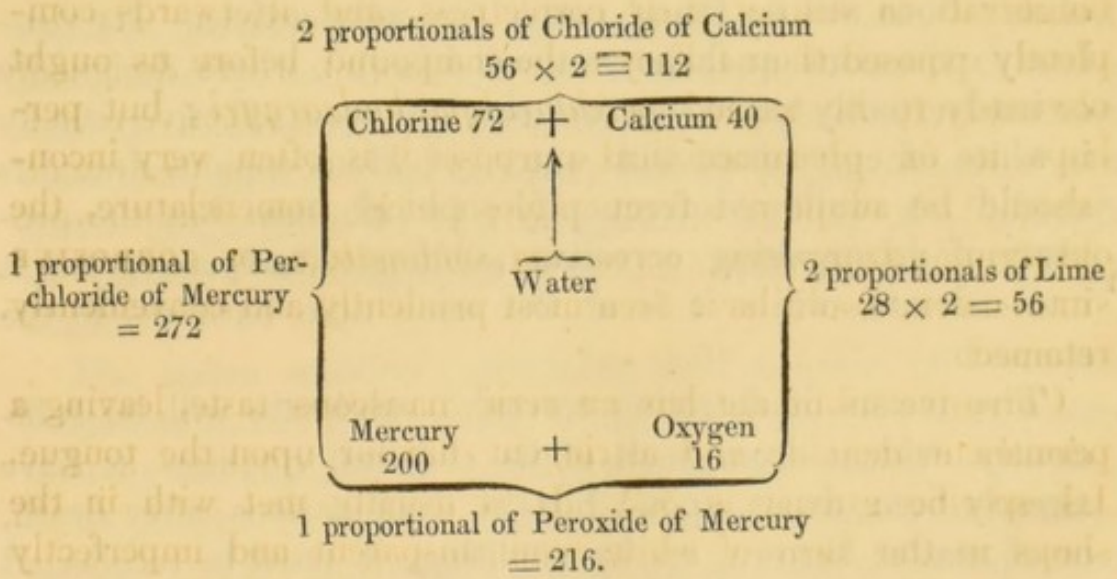
The persulphate of mercury is generally prepared upon the large scale, by heating the acid and metal in an iron pot, proper means being adopted to carry off the copious fumes of sulphurous acid arising from the decomposition of a portion of the sulphuric acid, during the peroxidizement of the mercury. The whole is then evaporated to dryness, and the subsequent sublimation is performed in glass, earthenware, or iron vessels, their form and arrangement being much dependent upon the quantity of materials employed.

As the only demonstrable components of perchloride of mercury are chlorine and mercury, the impropriety of the term "*hydrargyri oxymurias*," applied to it in the Pharmacopœiæ, is obvious; for it neither contains oxygen nor muriatic acid. To the erroneous views in which this term originated, it is not necessary now to allude; nor shall I recur to those masterly researches of Sir H. Davy which first taught us to suspect their correctness, and afterwards completely exposed their fallacy: the compound before us ought obviously to be termed *perchloridum hydrargyri*; but perhaps, as for pharmaceutical purposes it is often very inconvenient to adopt a correct philosophical nomenclature, the old term *hydrargyrum corrosivum sublimatum*, or CORROSIVE SUBLIMATE, would have been most prudently and conveniently retained.

Corrosive sublimate has an acrid nauseous taste, leaving a permanent metallic and astringent flavour upon the tongue. Its specific gravity is 5.2. It is usually met with in the shops in the form of white semitransparent and imperfectly crystallised masses, or in powder. It frequently exhibits prismatic crystals upon the inner surfaces of the sublimed masses. It is soluble in twenty parts of water, at the temperature of 60°, and boiling water takes up about one-third its weight: alcohol at 60° dissolves half its weight, and ether, at the same temperature, about one-third its weight. When heated, it readily and entirely sublimes in the form of a dense white vapour, powerfully affecting the nose and mouth. It dissolves without decomposition in muriatic acid, but is insoluble in concentrated nitric and sulphuric acids. Muriatic acid of the specific gravity 1.158, at the tempera-

ture of 60°, dissolves about its own weight, and the solution, when cooled to about 40°, concretes into a mass of acicular crystals.

When solutions of potassa, soda, or lime, are mixed with solution of corrosive sublimate, a yellow precipitate is thrown down, which is a hydrated peroxide of mercury. Such a mixture of a pint of lime water with a drachm of corrosive sublimate was formerly much used as an application to venereal ulcers, under the name of "*aqua phagadænica.*" It is in fact a solution, containing undecomposed corrosive sublimate and chloride of calcium (muriate of lime) mixed with peroxide of mercury, *two* proportionals of lime being required for the decomposition of *one* proportional of corrosive sublimate, as shewn in the following diagram, which also exhibits the theory of the decomposition:—



When solution of corrosive sublimate is decomposed by ammonia, the result is not peroxide of mercury, but a white precipitate, which is composed of muriate of ammonia and peroxide of mercury.—(See *Hydrargyrum Præcipitatum Album.*)

Muriate of ammonia considerably increases the solubility of corrosive sublimate, one part rendering five parts soluble in rather less than five of water. Such solutions have occasionally been introduced into Pharmacopœiæ, and are useful for the internal exhibition of corrosive sublimate. Boer-

haave's solution had a place in the Edinburgh Pharmacopœia of the year 1783; it was composed as follows:—

℞ Mercurii Sublimati Corrosivi gr. vj.
Salis Ammoniaci gr. xij. Solve in
Aquæ destillatæ libra una.

The solubility of corrosive sublimate is also much increased by common salt. A solution composed of seven parts of salt and twenty of water dissolves thirty-two parts of corrosive sublimate: it deposits rhomboidal crystals, probably composed of one proportional of each of the chlorides *.

Corrosive sublimate is decomposed by several of the metals: they generally abstract half the chlorine, and convert it into calomel.

The medical properties and uses of corrosive sublimate have already been partially described (page 98), and some further observations will be found under the next article. Its virulently poisonous qualities are well known: where designedly or inadvertently taken in overdoses, the most effective remedy is white of egg mixed with water, of which copious draughts should be swallowed frequently; for albumen has the property of decomposing corrosive sublimate, and converting it into calomel, while it is at the same time harmless to the stomach.

The means of detecting corrosive sublimate will be sufficiently evident from such of its chemical qualities as have already been dwelt upon; but in examinations after death, or of matter thrown up by vomiting, it must be recollected that the contents of the stomach and bowels sometimes change it into calomel †.

Liquor Hydrargyri Oxymuriatis.	*Solution of Oxymuriate of Mercury.*
℞ Hydrargyri Oxymuriatis grana octo,	Take of Oxymuriate of Mercury, eight grains.

* J. Davy. Phil. Trans., 1822, p. 364.

† See Orfila, tom. i., part 1, p. 100.

Aquæ destillatæ fluiduncias quindecim.	Distilled Water, fifteen fluid ounces,
Spiritûs rectificati fluidunciam;	Rectified Spirit, a fluid ounce;
Hydrargyri Oxymuriatem in Aqua destillata liqua, eique adjice Spiritum.	Dissolve the Oxymuriate of Mercury in the distilled Water, and add the Spirit to it.

The object of this solution is to furnish a convenient means of subdividing corrosive sublimate into small doses for internal use; but it unfortunately happens that aqueous solutions of corrosive sublimate, unless very cautiously excluded from the light, suffer a decomposition; they deposit calomel, and traces of free muriatic and chloric acids are found in the water. This decomposition, as appears from Dr. Davy's evidence *, is accelerated by the addition of a small quantity of alcohol to the water: in other words it would be more rapid in the above "*liquor hydrargyri oxymuriatis*," than in a mere aqueous solution: on the contrary it is found that the decomposition is entirely prevented by the presence of muriate of ammonia, or of common salt; hence, in the formula above given (page 98), we have suggested the use of a solution of corrosive sublimate, to which a little sal ammoniac is added.

The above solution (containing half a grain of corrosive sublimate in the fluid ounce) would be rendered unexceptionable by the addition of eight grains of muriate of ammonia; in its present form it is liable to deposit calomel, and consequently to vary in strength; a most important objection in the use of so powerful a remedy, and one which, in fact, renders its employment inadmissible †.

* Phil. Trans., 1822, p. 365.

† Solutions and ointments of corrosive sublimate and white arsenic are effective and convenient applications for the destruction of bugs. The infested beds should be taken to pieces, and every joint and crevice well anointed and brushed over with the following solution or ointment:—

Dissolve one ounce of corrosive sublimate in a pint of rectified spirit of wine, and add four ounces of castor oil, and four ounces of oil of turpentine.

Reduce one ounce of corrosive sublimate and one of white arsenic to a fine

Hydrargyrum Præcipitatum Album.

White Precipitated Mercury.

℞ Hydrargyri Oxymuriatis libram dimidiam,
Ammoniæ Muriatis uncias quatuor,
Liquoris Potassæ Subcarbonatis octarium dimidium,
Aquæ destillatæ octarios quatuor;

Primò Ammoniæ Muriatem, dein Hydrargyri Oxymuriatem, in Aqua destillata liqua, et his adjice Liquorem Potassæ Subcarbonatis. Pulverem demissum lava, donec saporis expers fuerit; tum exsicca.

Take of Oxymuriate of Mercury, half a pound,
Muriate of Ammonia, four ounces,
Solution of Subcarbonate of Potassa, half a pint,
Distilled Water, four pints;

First dissolve the Muriate of Ammonia, then the Oxymuriate of Mercury, in the distilled Water; to these add the Solution of Subcarbonate of Potassa. Wash the precipitated powder until it becomes tasteless; then dry it.

In this process a compound of muriate of ammonia and corrosive sublimate is decomposed by subcarbonate of potassa, carbonic acid is evolved, and a precipitate is formed, consisting of peroxide of mercury in combination with muriate of ammonia. The proportions, according to Mr. Hennell's experiments *, are 80 peroxide of mercury + 20 muriate of ammonia, numbers which correspond with—

1 proportional of Peroxide of Mercury.....	= 216
1 ——————— Muriate of Ammonia.....	= 54
Equivalent of White Precipitate.....	270

This mercurial preparation is limited to external use.—(See *unguentum hydrargyri præcipitati albi.*) It is sometimes employed, either alone or mixed with a little powdered starch,

powder; mix with it one ounce of sal ammoniac in powder, two ounces of oil of turpentine, two ounces of yellow wax, and eight ounces of olive oil: put these ingredients into a gallipot placed in a pan of boiling water, and when the wax is liquefied, stir the whole in a mortar till cold. To prevent accidents, the above compositions should be distinctly labelled—BUG POISON.

* Quarterly Journal of Science, vol. xviii., p. 297.

for the destruction of vermin; this it effects without producing much cuticular irritation.

Hydrargyrum Purificatum. — *Purified Mercury.*

Hydrargyrum in retortam ferream infunde, et, igne subjecto, destillet Hydrargyrum purificatum.

Pour Mercury into an iron retort, and having subjected it to fire, let the purified Mercury be distilled.

Mercury, as it is met with in commerce, is generally extremely pure. In examining it in very large quantities, I have, in one instance only, found it intentionally adulterated, and then it contained lead, tin, and bismuth. The process, therefore, of re-distillation, supposing it effectual, is rarely requisite; but the attraction between mercury and the above mentioned metals is so considerable, that, notwithstanding their inferior volatility, they pass over with its vapour: indeed the purification of mercury is not easily effected, and the principal attention of the pharmaceutical chemist should be directed to purchasing it pure, in the market. Mercury which is impure is generally of a dull and dirty aspect, and easily tarnishes; it wants the fluidity and mobility of the pure metal; when shaken in a phial it soils or adheres to the glass; and agitated with very dilute sulphuric acid, the adulterating metals are rapidly oxydized, in consequence of a resulting electrical action. Lead is thus easily detected by shaking the sophisticated mercury with equal parts of acetic acid and water, pouring off the liquor, and testing it by a solution of sulphate of soda and of hydriodate of potassa; the former occasions a white, the latter a yellow precipitate.

Bismuth is discovered by dropping a nitric solution, prepared in the cold, into a large glass of distilled water, when a white precipitate is produced of subnitrate of bismuth: this is immediately rendered brown by sulphuretted hydrogen.

If this nitric solution contain tin, it affords, when diluted and tested by muriate of gold, a purple precipitate; and if

zinc be present, carbonate of potassa occasions in it a white cloud, soluble in excess of the alkaline solution. The specific gravity of pure mercury is 13.54.

Hydrargyri Submurias.

℞ Hydrargyri purificati *pondere* libras quatuor,
Acidi sulphurici *pondere* uncias triginta,
Sodæ Muriatis libram cum semisse,
Ammoniæ Muriatis uncias octo;

Hydrargyri libras duas cum Acido sulphurico in vase vitreo coque, donec Hydrargyri Sulphas exsiccata fuerit; hanc ubi refrixerit cum Hydrargyri libris duabus, in mortario fictili contere ut optimè misceantur. Dein Sodæ Muriatem adjice, et simul tere, donec globuli non ampliùs conspiciantur: tum sublima. Sublimatum in pulverem subtilissimum contere, per cribrum transmitte, et cum Ammoniæ Muriate, in Aquæ destillatæ ferventis congio priùs liquefactâ, diligenter misce. Sepone ut subsidat pulvis. Liquorem effunde, et pulverem Aquâ destillatâ fervente sæpiùs ablue, donec Liquore Ammoniæ instillato nihil dejiciatur. Denique fiat pulvis subtilissimus, eodem modo quo Cretam præparari præcepimus.

Submuriate of Mercury.

Take of purified Mercury, *by weight*, four pounds,
Sulphuric Acid, *by weight*, thirty ounces,
Muriate of Soda, a pound and a half,
Muriate of Ammonia, eight ounces;

Boil two pounds of the Mercury with the sulphuric Acid in a glass vessel, until the Sulphate of Mercury is dry. When it has cooled, rub it with two pounds of the Mercury in an earthenware mortar, till they are well mixed. Then add the Muriate of Soda, and rub them together until globules are no longer visible. Then sublime. Reduce the sublimate to a very fine powder, pass it through a sieve, and mix it well with the Muriate of Ammonia previously dissolved in a gallon of distilled Water. Set it by, that the powder may subside. Pour off the liquor and wash the powder frequently with boiling distilled Water, until Solution of Ammonia, dropped in, produces no precipitate. Lastly reduce it to a very fine powder in the manner we have directed for the preparation of Chalk.

This process for the preparation of calomel was originally adopted at Apothecaries' Hall, and has many advantages over the more usual method of the former Pharmacopœia. A persulphate of mercury is first formed by boiling two pounds of

the metal with thirty ounces of sulphuric acid to dryness. This process may be performed in the large way, in a cast iron vessel, which should be conveniently arranged for the escape of the abundant fumes of sulphurous acid developed by the action of the mercury, and which are often a serious nuisance to the neighbourhood. They may be very effectually annihilated by suffering them to pass through a very long flue and lofty chimney, mixed with abundance of coal smoke. The *persulphate* of mercury is triturated with a sufficient quantity of metallic mercury to convert it into a *protosulphate*, and then mixed with a due proportion of common salt, and subjected to sublimation.

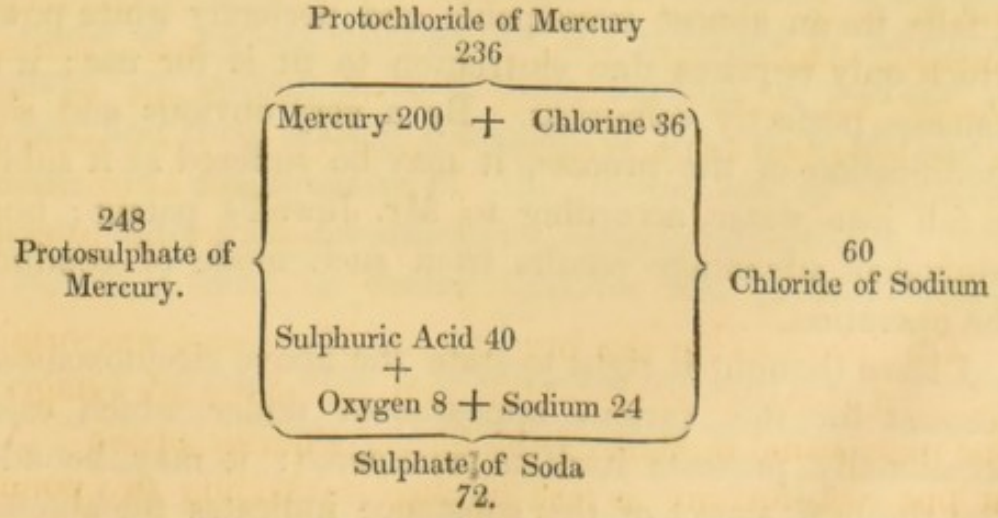
Protosulphate of mercury is a compound of—

1 proportional of Protoxide of Mercury	= 208	....	83.8
1 ——————— Sulphuric Acid	= 40	....	16.2
	248		100

To convert it into calomel it requires *one* proportional of chloride of sodium, (common salt) the nature of the action of which, and the proportions of results, will be evident from the following table, premising that calomel consists of—

1 proportional of Mercury	= 200	....	84.75
1 ——————— Chlorine	= 36	....	15.25
	236		100

it is, therefore, a *protochloride of mercury*.



In this decomposition, (as in that for the formation of corrosive sublimate) the oxygen of the oxide of mercury (contained in the sulphate) is transferred to the *sodium* of the common salt, which thus becomes *soda*, and forms, with the sulphuric acid, a sulphate of soda.

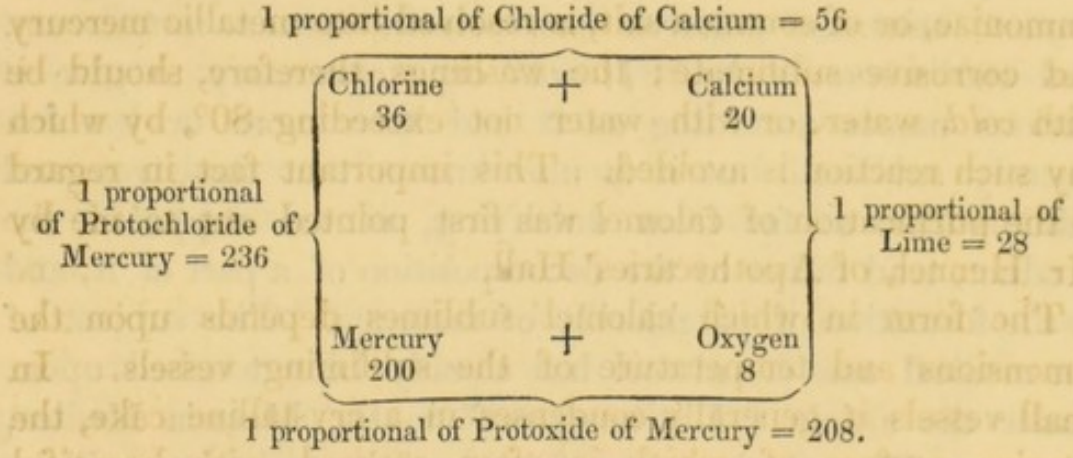
The further directions relate to the washing of the calomel in order to ensure the separation of any adhering corrosive sublimate, and to its reduction into the state of a very fine powder. In the elutriation, muriate of ammonia is employed in consequence of the extreme solubility which it confers on the perchloride of mercury: common salt answers equally well and is cheaper, but it deserves notice in relation to this part of the process, that calomel *boiled* with solution of sal-ammoniac, or of common salt, is resolved into metallic mercury and corrosive sublimate; the washings, therefore, should be with *cold* water, or with water not exceeding 80°, by which any such reaction is avoided. This important fact in regard to the purification of calomel was first pointed out to me by Mr. Hennel, of Apothecaries' Hall.

The form in which calomel sublimes depends upon the dimensions and temperature of the subliming vessels. In small vessels it generally condenses in a crystalline cake, the interior surface of which is often covered with beautiful quadrangular prismatic crystals, perfectly transparent, and of a texture somewhat elastic or horny: in this state it acquires, by the necessary rubbing into powder, a decidedly yellow or buff colour, more or less deep according to the degree of trituration which it has undergone. If on the contrary the calomel be sublimed into a very capacious and cold receiver, it falls in an almost impalpable and perfectly white powder, which only requires due elutriation to fit it for use; it then remains perfectly colourless. By a very obvious and simple modification of the process, it may be suffered as it sublimes to fall into water, according to Mr. Jewell's patent; but no equivalent advantage results from such mode of conducting the operation.

I have thought it right to state the above circumstances, to account for the various appearances under which calomel occasionally presents itself in commerce: it may be added, that the buff aspect of this substance indicates the absence of

corrosive sublimate; though it by no means follows as a consequence, that when snow-white it contains it. When the surface of massive sublimed calomel is scratched, it always exhibits a buff colour.

Calomel should be perfectly tasteless, inodorous, and insoluble in water*. Its specific gravity is 7.2. It is decomposed by the fixed alkalies (see *hydrargyri oxydum cinereum*) and by ammonia, and protoxide of mercury is one of the results. The theory of this decomposition in the case where lime water is used, as opposed to that of corrosive sublimate under similar circumstances, is shewn in the annexed diagram:—



Calomel, if not carefully washed, may, under some circumstances, contain a minute portion of corrosive sublimate; it may be detected by boiling it in pure water, and adding to the filtered and cold liquor a few drops of an aqueous and transparent solution of white of egg. A white cloud indicates the presence of the perchloride of mercury or corrosive sublimate. The mode of testing calomel for the presence of corrosive sublimate, by boiling it in a weak solution of muriate of ammonia, and then adding carbonate of potassa, is obviously fallacious, in consequence of the *production* of corrosive sublimate under such circumstances, already adverted to.

It cannot, I think, be denied that the best pharmaceutical

* Calomel is sometimes stated to be soluble to a very small extent in water, but after very careful washing I have found that boiling water filtered through it is not in the least affected by solution of sulphuretted hydrogen, provided care be taken to avoid the mixture of any suspended calomel.

term for protochloride of mercury is CALOMEL; it is short, open to no misconception, and is not, like the term *submuriate of mercury*, calculated to convey a very erroneous idea of the nature of the compound.

Beguin, in 1608, is the first European author who describes calomel; he calls it *draco mitigatus;* corrosive sublimate was known to the alchemists under the name of "the dragon." It appears, however, from Mr. Hatchett's experiments and observations on the calomel of Thibet, published in Nicholson's Journal for June 1803, that this substance had long been known to and prepared by the natives of that part of India. Among other whimsical names given to it by the older pharmaceutical chemists, are *aquila alba*, *panchymagogum minerale*, *panacea mercurialis*, *manna metallorum*, and *sublimatum dulce*. It was once customary to give it various names according as it had been more or less frequently sublimed, but it is now known that these repeated sublimations, so far from dulcifying, as was supposed, the product, tend rather to the decomposition of a part of it, and to the formation of perchloride of mercury. The subject of the medical uses of calomel has already been touched upon, under the article "Hydrargyrum" in the Materia Medica, (see page 97). Some other of its useful applications will be noticed under the subdivisions of this part of the work, relating to powders and pills.

Hydrargyri Sulphuretum Nigrum.	*Black Sulphuret of Mercury.*
℞ Hydrargyri purificati *pondere* libram, Sulphuris sublimati libram;	Take of purified Mercury, *by weight*, a pound, Sublimed Sulphur, a pound;
Tere simul, donec globuli non ampliùs conspiciantur.	Rub them together until globules are no longer perceptible.

The nature of this compound has not hitherto been clearly defined; at all events it is not a "sulphuret of mercury," for

the proportions of sulphur and mercury employed in its formation are such as, under any circumstances, to leave a considerable excess of the former. Assuming that a compound of one proportional of sulphur and one of mercury is formed by merely triturating mercury with sulphur at common temperatures, Mr. Phillips * considers this officinal preparation as consisting of—

Protosulphuret of Mercury	58
Sulphur	42
	100

But the only true protosulphuret of mercury with which I am acquainted, is that obtained by passing sulphuretted hydrogen through a very dilute solution of protonitrate of mercury: it then falls in the form of a dense black powder; at a red heat it gives off metallic mercury and cinnabar sublimes; boiled with nitric acid, it is converted into sulphate of mercury.

The nature of the above *hydrargyri sulphuretum nigrum* is shewn by the following experiments. When boiled repeatedly in a solution of potassa, the excess of sulphur is removed, and a black insoluble powder remains, which, when washed and dried, is not acted on by nitric acid, and which at a red heat sublimes without decomposition and assumes the characters of cinnabar: this compound therefore appears to be a mixture of bisulphuret of mercury and sulphur, and does not contain any of the protosulphuret. The strong attraction of sulphur for mercury is shewn by what happens when the ingredients of the above formula are powerfully triturated together in large quantity; they become very hot, cake, and exhale a strong sulphureous odour.

If, then, this *hydrargyri sulphuretum nigrum* be a mixture of bisulphuret of mercury and sulphur, it should, according to the theory of equivalents, consist of—

Bisulphuret of Mercury	58
Sulphur	42
	100

* Trans. Pharm., p. 123.

numbers which accord with Mr. Phillips, but which ought, upon his view of the subject, to be—

Protosulphuret of Mercury	54
Sulphur	46
	100

This compound is the *ethiops mineral* of old pharmacy; it is a black insipid powder, and perfectly volatile at a red heat. According to Mr. Thomson*, "it is insoluble in nitric acid, but is totally dissolved by a solution of pure potass, from which the acids precipitate it unchanged." The fact is, that solution of potassa only dissolves the excess of sulphur, and acids throw down sulphur only, from the solution. A strong boiling solution of hydrosulphuret of potassa however dissolves a very minute portion of sulphuret of mercury, as appears by the discoloration of the sulphur when afterwards thrown down by an acid. "It is often," he adds, "ill prepared, which may be known by rubbing a portion of it on gold, to which, if it be good, no whiteness will be communicated. It is also sometimes adulterated with ivory black, which may be detected in it by throwing a little of the suspected sulphuret on a red hot iron; if ivory black be present, some ashes will be left after the volatilisation, which will not be the case when it is good, the pure sulphuret being completely dissipated." "If," says Mr. Phillips, "it be adulterated with sulphuret of antimony, boil a little of the powder in undiluted muriatic acid, pour the clear solution into water, and submuriate of antimony will be precipitated." The fact however is, that these and a number of other adulterations to which the chemical articles of the Pharmacopœia are supposed to be liable, are scarcely to be apprehended in London, where the regular market is exclusively supplied by a few manufacturers only, and those of high respectability.

In regard to the medicinal uses of the compound before us, it is a very uncertain, inert, and useless remedy, which we can account for by its being a mere mixture of cinnabar and sulphur. From five to thirty grains have been prescribed as

* Lond. Disp., 1822, p. 684.

an alterative, and certain obstinate cutaneous affections are said to have yielded to its powers. Some have recommended it in scrofulous affections of the glands, and others have ascribed to it peculiar sedative powers. In consequence of its very mild and slow operation, it has been especially selected for children; but, as we have before said, its efficacy is so doubtful, that scarcely any practitioner employs it with confidence, and it might well have been rejected from the Pharmacopœia.

Hydrargyri Sulphuretum Rubrum. — *Red Sulphuret of Mercury.*

℞ Hydrargyri purificati *pondere* uncias quadraginta,
Sulphuris sublimati uncias octo;

Hydrargyrum cum Sulphure ad ignem liquefacto misce, et, quamprimùm intumescat massa, vas ab igne remove, et fortiter tege, ne fiat inflammatio; deinde in pulverem tere, et sublima.

Take of purified Mercury, *by weight*, forty ounces,
Sublimed Sulphur, eight ounces;

Mix the Mercury with the melted Sulphur over the fire, and, as soon as the mass begins to intumesce, remove the vessel from the fire, and cover it forcibly, lest it should inflame; then reduce it to powder, and sublime.

This, as an article of pharmacy, is yet more useless than the preceding, in which the excess of sulphur may, in some cases, be useful: it has no medical virtue, and is probably only retained for mercurial fumigation, a practice not only nearly obsolete, but the object of which may be attained by other less exceptionable means.

This compound, known under the names of *cinnabar* and *vermilion*, is a bisulphuret of mercury, composed of—

1 proportional of Mercury	= 200		86.2
2 ——— Sulphur	16×2 = 32		13.8
	232		100

When taken out of the subliming vessel, it appears of a

fibrous texture, and a grey colour, but it acquires a fine red tint when duly levigated. It occurs native, and is the principal ore of mercury, the metal being obtained by distilling it with iron-filings and lime, by which it is easily decomposed at high temperatures. On account of the brilliancy of its colour, it is abundantly used as a pigment, but with oil or water it soon acquires a dingy hue. When purchased in powder it is sometimes adulterated with red lead, in which case it is not, as it should be, entirely volatile at a red heat.

Cinnabar forms an ingredient in certain nostrums for gout, rheumatism, and the bites of rabid animals; and according to Dr. Paris, to whom we are indebted for exposing the composition of several quack remedies, it is the leading ingredient in *Chamberlain's restorative pills; "The most certain cure for the scrofula or King's evil, fistula, scurvy, and all impurities of the blood*."*

Cinnabar is insoluble in nitric and muriatic acids. Boiled in sulphuric acid, sulphurous acid is evolved, and sulphate of mercury is formed. Nitromuriatic acid acts upon and decomposes it, even in the cold.

PREPARATIONS OF LEAD.

Plumbi Acetas.

℞ Plumbi Subcarbonatis libram,

Acidi acetici fortioris octarium,
Aquæ destillatæ ferventis octarium cum semisse;

Misce Acidum cum Aqua: his Plumbi Subcarbonatem paulatim adjice, et coque donec Acidum saturetur; deinde per chartam cola, et, Aquâ

Acetate of Lead.

Take of Subcarbonate of Lead, a pound,
Strong acetic Acid, a pint,
Boiling distilled Water, a pint and half;

Mix the acid with the Water; to which add the Subcarbonate of Lead gradually, and boil until the Acid is saturated; then filter through paper,

* Pharmacologia, vol. ii. p. 247.

consumptà donec pellicula subnascatur, sepone ut fiant crystalli. Has, effuso liquore, super chartam bibulam exsicca.

and having evaporated until a pellicle appears, set it by, that crystals may form. Pour off the liquor, and dry them upon bibulous paper.

Lead is a metal of a bluish white colour and much brilliancy, which soon tarnishes by exposure to air. Its specific gravity is 11.35. It fuses, according to Mr. Daniell *, at 609° Fahrenheit. It forms three oxides; the protoxde isi yellow, and known in commerce by the name of *massicot:* the deutoxide is well known as *minium* or *red lead:* the peroxide is brown, and not used. Of these oxides the first only is salifiable; it consists of—

1 proportional of Lead	=	104	92.8
1 —— Oxygen	=	8	7.2
		112	100

And white lead or carbonate of lead (called in the above formula *subcarbonate*), consists of—

1 proportional of Protoxide of Lead	=	112	83.6
1 —— Carbonic Acid	=	22	16.4
		134	100

By the above process the carbonate of lead is decomposed by boiling it with the acetic acid, and crystallised acetate of lead is easily obtained by the usual process; but this salt, known in commerce under the name of *sugar of lead*, is largely manufactured in the wholesale way, and seldom therefore prepared in the pharmaceutical laboratory: it ought consequently to have had a place in the *Materia Medica.* It consists of—

1 proportional of Protoxide of Lead	=	112	59.25
1 —— Acetic Acid	=	50	26.45
3 —— Water 9×3	=	27	14.30
		189	100

* Quarterly Journal, vol. xi. p. 309.

Acetate of lead forms prismatic crystals, soluble in about four parts of water at 60°, and of a singularly sweet and somewhat astringent taste. It generally occurs in commerce in masses composed of irregular assemblages of acicular crystals, and is seldom perfectly soluble in water. The smallest portion of sulphuric or carbonic acid in water produces a precipitate when acetate of lead is added. A current of carbonic acid passed through a solution of this salt throws down one half of the oxide of lead in the state of carbonate, and an uncrystallisable *binacetate* of lead remains in solution. When finely powdered protoxide of lead is boiled in a solution of the acetate, a portion equal to that originally existing in the salt is taken up, and a *subacetate* of lead is formed, composed of one proportional of acid and two proportionals of oxide: in the above formula, therefore, rather less carbonate of lead than is required to saturate the acid is directed, in order to insure the production of the neutral acetate.

Externally, acetate of lead has been very long employed as a sedative and astringent application: it has also acquired considerable celebrity as an internal remedy, requiring, however, considerable caution in its exhibition. Its principal use is in *urgent* cases of internal hæmorrhage, as of the lungs, stomach, or uterus; and in consequence of the violently spasmodic action of the bowels, which it is apt to induce, it requires generally to be given with opium, and often with some mild aperient. Paralytic affections occasionally follow its administration, where due precaution in regard to the state of the bowels is not taken.

In hæmoptysis, where the quantity of blood coughed up is considerable, or where the usual remedies, especially nitre and dilute sulphuric acid, fail, acetate of lead may be given as in the following formula, care being taken to avoid in the medicines and drinks those acids which decompose it, and especially the sulphuric, by which, as appears from Orfila's experiments*, it is rendered nearly, if not quite inert: hence it is that sulphate of soda is an effective anti-

* Traité des Poisons, tom. i. 2me partie, p. 281.

dote where any of the soluble salts of lead have been swallowed.

℞ Plumbi Acetatis, gr. iv.
Pulveris Opii, gr. iij.
Confectionis Rosæ Caninæ, q. s.
Misce et divide in pilulas sex æquales, quarum sumatur una ter in die.

A proper dose of digitalis may be combined with the above pills; or it may be given with acetate of lead as follows:—

℞ Plumbi Acetatis, gr. j. Solve in
Aquæ Rosæ f℥j. et adde
Oxymellis Simplicis f℥j.
Tinctur. Opii ♏v.
——— Digitalis ♏x.
Fiat haustus quartis vel sextis horis sumendus.

In hæmatemesis the same remedies may be had recourse to; also in menorrhagia; but in all these cases the necessity of active measures for subduing febrile symptoms, where the inflammatory diathesis prevails, must not be lost sight of; nor should the patient be, in any case, suffered to continue the use of the acetate of lead for a length of time.

When solutions of acetate of lead are used externally, the salt should be dissolved in distilled water, and all substances tending to decompose it should be carefully avoided. The addition of a little acetic acid to these lotions prevents the deposition in them of carbonate of lead; and where they are used as collyria, such deposition is sometimes mischievous: they are employed in ophthalmia, and generally as astringents and sedatives in all cases of superficial inflammation. When, as is often the case, a little carbonate of lead is contained in the acetate, the solution should generally be directed to be filtered, especially if it is to be applied to the eyes. For collyria, the proportion of acetate of lead may be about ten grains, and for lotions about thirty grains, to eight ounces of rose or elder flower water, and two or three drachms of distilled vinegar may be added.

Liquor Plumbi Subacetatis.

℞ Plumbi Oxydi semivitrei libras duas,
Acidi acetici diluti congium;

Misce, et decoque ad octarios sex, assiduè movens; dein sepone, ut subsidant fæces, et cola.

Solution of Subacetate of Lead.

Take of semi-vitreous Oxide of Lead, two pounds,
Diluted acetic Acid, a gallon;

Mix, and boil down to six pints, constantly stirring; then set the liquor by, that the dregs may subside, and filter.

The nature of litharge, or semi-vitreous oxide of lead, has already been pointed out (p. 139). By boiling this oxide in dilute acetic acid, as directed in the above process, an uncrystallisable solution of *subacetate of lead* is obtained, not much different from that procured by boiling a mixture of acetate and oxide of lead in water, and containing—

2 proportionals of Protoxide of Lead...	112 × 2 = 224
1 ——————— Acetic Acid	= 50
	274

The relative quantity of oxide in this solution will obviously depend upon the strength of the distilled vinegar used in its formation. "When the specific gravity of the latter is 1.007, that of the solution of subacetate of lead is 1.220, but if the vinegar is so strong as to have a specific gravity of 1.009, then that of the subacetate reaches 1.309."*

This solution, when made as above directed, is of a pale-yellowish colour; when deep brown it has probably been made with common instead of distilled vinegar, as formerly directed in the London and most other Pharmacopœiæ under the term *extractum Saturni*. It is decomposed by the soluble carbonates, sulphates, and muriates, and by the greater number of soluble vegetable principles; it renders water turbid which contains the minutest portion of carbonic acid. It is limited to external use, and is, when duly diluted with

* Phillips's Trans. Pharmacop. p. 127.

distilled water, as in *Goulard's saturnine lotion*, a valuable sedative and astringent application, in almost all cases of external inflammation. In an undiluted state applied upon lint it occasionally heals old and troublesome sores, and is recommended by Dr. Vetch* as possessing great efficacy in altering the violently purulent state of the membrane in conjunctival ophthalmia; in opaque cornea, he remarks that it is the only substance which he has found beneficial, from its astringency upon the palpebral surface, without exciting hurtful consequences as a stimulus: he adds, that although this solution of lead, when undiluted, merely occasions a temporary sensation as if sand or gravel had got into the eye, yet it often causes much heat and smarting when diluted.

An opinion has prevailed with some that preparations of lead, externally applied, are liable to produce mischievous effects in consequence of being absorbed into the system, but this can only happen where they are long and carelessly persevered in; the possibility, however, of such an effect should not be lost sight of.

Liquor Plumbi Subacetatis Dilutus.	*Diluted Solution of Subacetate of Lead.*
℞ Liquoris Plumbi Subacetatis fluidrachmam, Aquæ destillatæ octarium, Spiritûs tenuioris fluidrachmam; Misce.	Take of Solution of Subacetate of Lead, a fluid drachm, Distilled Water, a pint, Proof Spirit, a fluid drachm; Mix.

This should have been left to extemporaneous prescription, for the degree of dilution in which it is desirable to apply the solution of subacetate of lead varies extremely with the nature of the case. The object of the addition of a drachm of proof-spirit to a pint of the above solution is not manifest.

* On Diseases of the Eye, 1820: pp. 19 and 84.

PREPARATIONS OF ZINC.

Calamina Præparata.

Calaminam ure; tum contere. Deinde fiat pulvis subtilissimus eodem modo quo Cretam præparari præcepimus.

Prepared Calamine.

Calcine the Calamine; then bruise it; lastly reduce it to a very fine powder by the method which we have directed for the preparation of Chalk.

Under the article *calamina* in the list of Materia Medica, the composition, properties, and uses of that substance are enumerated. If it be pure and subjected to calcination, as above directed, little else than oxide of zinc will remain; but from the impurities of the ore, we generally find in the prepared calamine of the shops a considerable portion of earthy matter.

Zinci Oxydum.

℞ Zinci Sulphatis libram,
Liquoris Ammoniæ octarium, vel quantum satis sit,
Aquæ destillatæ octarium;

Zinci Sulphatem in Aqua destillata liqua, et adjice Liquoris Ammoniæ quantum satis sit, ut Oxydum Zinci penitùs dejiciatur. Liquore effuso pulverem Aquâ destillatâ sæpius ablue, et balneo arenæ exsicca.

Oxide of Zinc.

Take of Sulphate of Zinc, a pound,
Solution of Ammonia, a pint, or a sufficient quantity,
Distilled Water, a pint;

Dissolve the Sulphate of Zinc in the distilled Water, and add as much of the Solution of Ammonia as will suffice for the entire precipitation of the Oxide of Zinc. Having poured off the clear liquor, wash the powder repeatedly with distilled Water, and dry it on a sand-bath.

This oxide, under the name of "flowers of zinc," has long had a place in Pharmacopœiæ, and was prepared by exposing the metal to a temperature sufficient to cause its inflammation and rapid oxidizement. Old authors describe it under the names of *pompholix*, *nihil album*, and *philosopher's wool*. In

Holland its preparation was kept secret, and it was sold under the name of *arcanum Ludemanni* or *luna fixata*, the composition of which was originally divulged by Gaubius. When procured by combustion, this oxide is apt to contain small particles of the unburnt metal, and accordingly the above process is substituted, in which sulphate of zinc is decomposed by solution of ammonia; the oxide thus precipitated dries in the form of an impalpable white powder, and the only requisite caution in thus forming it is not to add ammonia in excess, which would redissolve a portion of the precipitate. In the above formula the word *octarium* should probably be *congium*, a gallon of water not being more than is required for the convenient solution of a pound of the sulphate.

This is the only known oxide of zinc; it consists of—

1 proportional of Zinc	=	34	81
1 ——————— Oxygen	=	8	19
		42	100

It is colourless, insipid, and insoluble in water; readily soluble in the greater number of the acids, and when recently precipitated and humid, is easily dissolved by solutions of potassa, soda, and ammonia.

The medical virtues of oxide of zinc are considered as antispasmodic and tonic; it has been advantageously prescribed in dyspeptic spasms of the stomach, in chorea, in whooping cough, and in epilepsy, in the dose of from two to ten grains twice or three times a day, accompanied by light bitters.

℞ Zinci Oxydi,
Extracti Anthemidis, āā gr. v.
Fiant pilulæ duæ bis vel ter in die sumendæ cum haustu sequenti.

℞ Infusi Gentianæ compos. f 3x.
Tinct. Cardamomi f 3ss. M.

Oxide of zinc is used externally in the form of ointment

(see *Unguentum Zinci*), and is sometimes sprinkled upon sores and excoriations, in the same way as calamine (p. 44).

It is said that this oxide is frequently adulterated with white lead, or with chalk: if so, the former fraud is easily detected by the insolubility of the sample in sulphuric acid diluted with four times its bulk of water; and the latter by the effervescence that would ensue upon the affusion of diluted acetic acid, from which oxalate of ammonia would afterwards throw down oxalate of lime.

Zinci Sulphas. — *Sulphate of Zinc.*

R Zinci frustulorum uncias quatuor,
Acidi sulphurici *pondere* uncias sex,
Aquæ destillatæ octarios quatuor;
Misce in vase vitreo, et, finitâ effervescentiâ, liquorem per chartam cola; tum decoque, donec pellicula subnascatur, et sepone, ut fiant crystalli.

Take of Zinc, in small fragments, four ounces,
Sulphuric Acid, *by weight*, six ounces,
Distilled Water, four pints;
Mix them in a glass vessel, and when the effervescence has ceased, filter the solution through paper; then evaporate until a pellicle forms upon its surface, and set it by, that crystals may form.

In this process the zinc is oxydized at the expense of the water, the hydrogen of which is evolved in the gaseous form; the acid combines with the oxide thus obtained, and a solution of *sulphate of zinc* is produced, which, by due evaporation, affords quadrilateral prismatic crystals, composed of—

1 proportional of Oxide of Zinc	.....	= 40	.....	29.5
1 ——— Sulphuric Acid	....	= 42	.....	31.0
6 ——— Water	.....	9 × 6 = 54	.....	39.5
		136		100

When the salt is pure, these crystals are colourless; but they not unfrequently have a brown or pink hue, arising from

a little iron or manganese: their taste is nauseously astringent and metallic; they dissolve in less than their own weight of boiling water, and in rather less than thrice their weight of water at the temperature of 60°: they are permanent in the air at ordinary temperatures; exposed to a red heat, their water of crystallisation is first driven off, then the acid is expelled, and oxide of zinc remains: their solution is decomposed by the alkalies, and by the alkaline carbonates, and oxide and carbonate of zinc are thrown down: a precipitate is also produced in several vegetable infusions by the addition of sulphate of zinc, more especially in those which abound in astringent matter.

The substance known in commerce under the name of *white vitriol*, is an impure sulphate of zinc, and is occasionally substituted for that directed in the above formula: this, however, should in all cases be avoided, inasmuch as it almost always contains sulphate of copper; it also retains much less water in its composition, so that it is considerably more active than the crystallised sulphate.

As an internal remedy, sulphate of zinc is chiefly used as a tonic and emetic; applied externally, it is a powerful and often useful astringent. It is given in very small doses, a quarter of a grain, for instance, twice or thrice a day, in dyspepsia (see page 146); in epilepsy one or two grains have been given every four or six hours; and in all diseases of debility connected with inflammatory action, it has been preferred to other minerals tonics, as being less apt to excite thirst, arterial action, and other febrile symptoms; but I doubt whether there are good grounds for this preference.

In dyspeptic affections, sulphate of zinc and other similar and powerful remedies generally require to be given in very small doses, and to be long persevered in, if we wish to derive the utmost benefit from their powers. Dr. W. Phillip says of this remedy—"in the opinion of many, the sulphate of zinc, given in very small doses, holds a distinguished place among the astringents suited to indigestion, and it is sometimes successful where other tonics fail. It may be given at later periods than iron, but it requires caution, and if its good effects do not soon appear, should be laid aside. It is

one of those powerful agents which must always be employed with some degree of suspicion*."

Sulphate of zinc is one of the numerous remedies resorted to in the cure of epilepsy, where it is usually given with vegetable bitters, and with the more powerful antispasmodics.

℞ Zinci Sulphatis gr. j.
Extracti Anthemidis gr. x.
Misce fiant pilulæ duæ quater die sumendæ.

The following has also been much extolled in epilepsy, by those who confide in the virtues of musk :—

℞ Zinchi Sulphatis gr. x.
Moschi ʒj.
Camphoræ ℈j.
M. et divide in pilulas viginti, quarum sumantur duæ bis vel ter in die.

In diseases attended by considerable irritability as well as debility, sulphate of zinc certainly appears preferable to sulphate of iron. In the advanced period of whooping cough, from an eighth to a quarter of a grain may be given twice or three times a day, conjoined with small doses of infusion of bark, or of cascarilla; or it may, if requisite, be united in pills with extract of hemlock or of henbane. "In Spasmodic coughs," Dr. Paris says†, "it is administered with the best effects, especially when combined with camphor or myrrh.

"℞ Zinci Sulphatis gr. x.
Myrrhæ in pulverem tritæ ʒjss.
Confect. Rosæ q. s. ut fiant pilulæ viginti, è quibus sumantur binæ bis quotidie.

"In affections of the chest attended with inordinate secre-

* On Indigestion, 4th edit. p. 206. † Pharmacologia, vol. ii. p. 462.

tion, I have witnessed much benefit from its exhibition, particularly when presented in the form of lozenge."

In the cure of intermittent fevers, sulphate of zinc is an admirable tonic, either with or without Peruvian bark; and in all those obstinate cases where the use of arsenic has been suggested, this salt of zinc should have a previous trial.

℞ Zinci Sulphatis gr. ij.
Aquæ Cinnamomi,
——— destillatæ, āā f℥ijss.
Tincturæ Calumbæ f℥j.
M. fiat mistura cujus capiat æger cochlearia tria ampla tertiâ vel quartâ quâque horâ.

It has been said that sulphate of zinc, which occasions a precipitation in infusion of Peruvian bark, is therefore incompatible with it; but the combination remains very effective: thus—

℞ Zinci Sulphatis gr. ss.
Decocti Cinchonæ f3xv.
Tincturæ Gentianæ compos. 3j.
M. fiat haustus ter quaterve die sumendus.

Nor does the following appear to be an unchemical combination—

℞ Zinci Sulphatis gr. ¼.
Quiniæ Sulphatis gr. ij.
Infusi Rosæ compos. f3x.
Tincturæ Aurantii,
Syrupi Aurantii, āā f3j.
M. fiat haustus quartâ quâque horâ sumendus.

In ulcerated sore throat a gargle of sulphate of zinc is often of the greatest local service: the following is among other forms that may be used:—

℞ Zinci Sulphatis ℈j.
Aquæ Rosæ f℥vij.
Oxymellis Simpl. f℥j.
M. fiat gargarisma frequenter utendum.

As an emetic, sulphate of zinc is generally very rapid and very certain in its action, and well suited to those cases in which it is desired to empty the stomach of any poisonous contents. The average dose for this purpose is twenty grains.

℞ Zinci Sulphatis ℈j.
Aq. Menthæ viridis f℥jss.
Spt. Lavandulæ compos. f℥j.
Fiat haustus emeticus.

At the commencement of febrile diseases, and in other analogous cases where emetics are administered, tartarised antimony and ipecacuanha, which tend to produce diaphoresis, independent of the mere exertion of vomiting, are to be selected in preference to sulphate of zinc.

In the form of a dilute solution in distilled water, sulphate of zinc is a good astringent application; as such it is used in ophthalmia, after the vascular congestion and excessive irritability have been removed, and when the inflammation tends to become chronic.

℞ Zinci Sulphatis gr. x.
Aquæ Rosæ f℥viij.
M. fiat collyrium.

A similar or somewhat stronger solution may also be employed with advantage in the latter stage of gonorrhœa.

PREPARATIONS OF SULPHUR.

Oleum Sulphuratum. — *Sulphurated Oil.*

℞ Sulphuris loti uncias duas,
Olivæ Olei octarium;

Oleo in vase ferreo peramplo calefacto Sulphur paulatim injice, et spathâ assiduè move, donec coïerint.

Take of washed Sulphur, two ounces,
Olive Oil, a pint;

Heat the Oil in a very large iron vessel, and add the Sulphur gradually, constantly stirring, until they have united.

When sulphur and fixed oil are heated together, they combine into a brown viscid compound, to which the term *balsam of sulphur* was formerly applied, and which is extolled by old pharmaceutical writers as "of good use to digest crude humours and indigested matter gathered together in any part of the body, being often anointed upon the same*." It was used also internally as a "marvellous restorative for weak lungs." At present, no use is made of this preparation; no one would think of prescribing it internally; and although sulphur is often a valuable external application, the above is a very ineligible form of it. That the oil has suffered a partial decomposition in this process, is evident from the odour of sulphuretted hydrogen which the compound exhales.

Anisated balsam of sulphur, once a celebrated remedy for hoarseness, consisted of the above, with the addition of a sixth part of the essential oil of aniseed. Ten drops were taken two or three times a day, mixed with powdered sugar.

Potassæ Sulphuretum. — *Sulphuret of Potassa.*

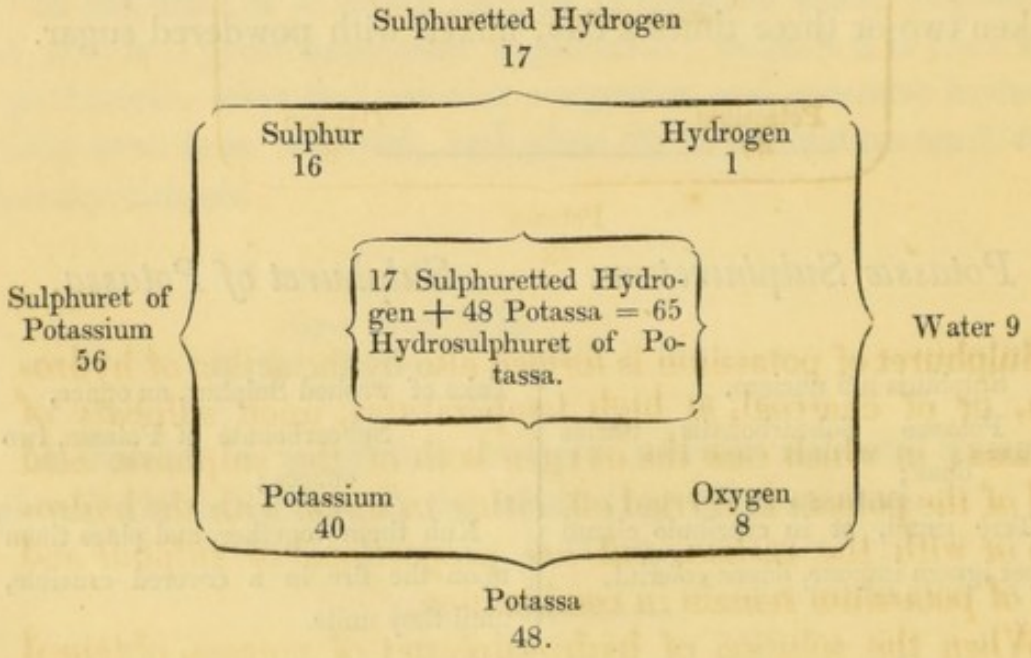
℞ Sulphuris loti unciam, Potassæ Subcarbonatis uncias duas; Tere simul, et in crucibulo clauso super ignem impone, donec coïerint.	Take of washed Sulphur, an ounce, Subcarbonate of Potassa, two ounces; Rub them together, and place them upon the fire in a covered crucible, until they unite.

The first effect perceived on heating this mixture of sulphur and subcarbonate of potassa, is the abundant evolution of carbonic acid gas, the whole of which is expelled; the sulphur then acts upon and decomposes part of the potassa, one portion forming sulphuric acid and sulphate of potassa, while another portion of the sulphur unites with potassium, to form a bisulphuret of that metal; the resulting compound,

* Salmon, Doron Medicum, p. 673.

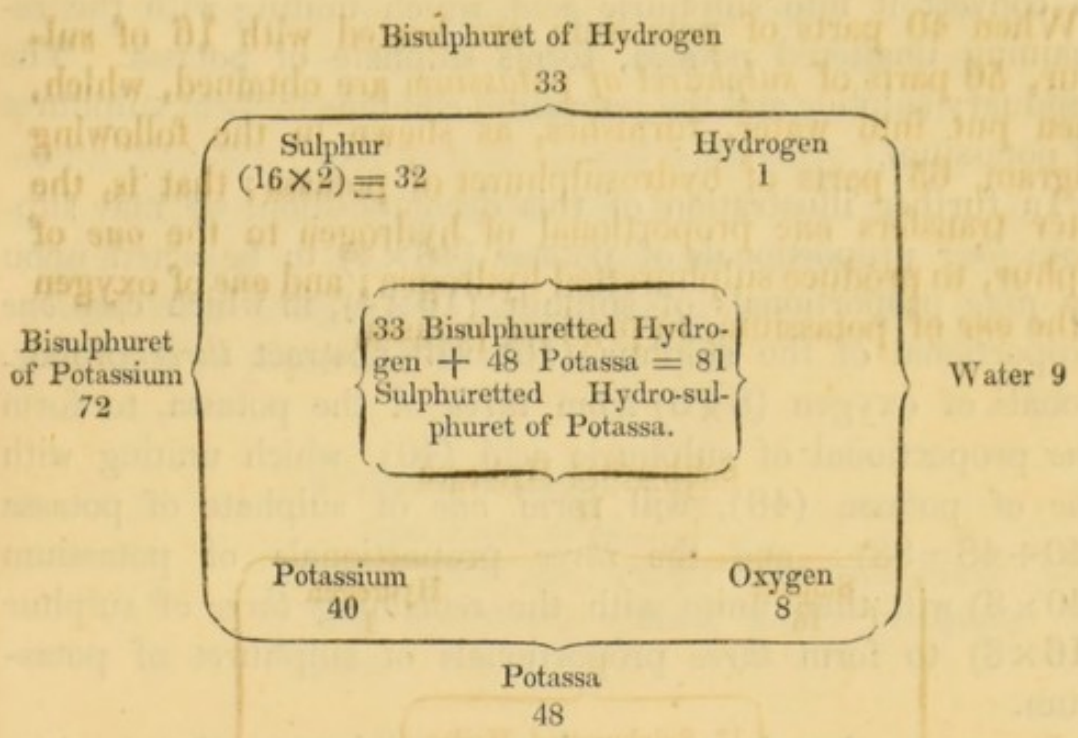
therefore, called "*potassæ sulphuretum*," is sulphate of potassa, with bisulphuret of potassium, and excess of sulphur. To render the details of the above decomposition explicit, it may be worth while more fully to describe the mutual action of sulphur and potassium and of sulphur and potassa, and the changes induced in these sulphurets by the action of water.

When 40 parts of potassium are heated with 16 of sulphur, 56 parts of *sulphuret of potassium* are obtained, which, when put into water, furnishes, as shewn in the following diagram, 65 parts of hydrosulphuret of potassa; that is, the water transfers *one* proportional of hydrogen to the *one* of sulphur, to produce sulphuretted hydrogen; and *one* of oxygen to the *one* of potassium, to produce potassa.



When *one* proportional of potassium (= 40) is heated with *two* of sulphur (= 32) a *bisulphuret of potassium* is formed, which resists a red heat without decomposition. The same compound is obtained whenever excess of sulphur is heated to redness with potassium. When put into water, it yields a solution of *sulphuretted hydrosulphuret of potassa*, or of a compound of potassa with bisulphuretted hydrogen; for only *one* proportional of water is decomposed by it, and *one* pro-

portional of potassa formed: the one proportional of hydrogen uniting with *two* of sulphur $(1 + 16 \times 2)$ to form *one* proportional of *bisulphuretted hydrogen*, represented by the equivalent number 33. These changes are shewn in the following diagram:—



Sulphuret of potassium is formed also by the action of hydrogen, or of charcoal, at high temperatures, upon sulphate of potassa; in which case the oxygen both of the sulphuric acid and of the potassa is carried off, either in union with the hydrogen or with the carbon, and *one* proportional of sulphur and *one* of potassium remain in combination.

When the solution of hydrosulphuret of potassa, obtained by dissolving sulphuret of potassium in water, or by passing sulphuretted hydrogen into solution of potassa, is decomposed by an acid, sulphuretted hydrogen gas is evolved, and there is no deposition or excess of sulphur. But when acids are added to the solution of sulphuretted hydrosulphuret of potassa, either sulphur or bisulphuret of hydrogen are deposited. If a *strong* solution of the sulphuretted hydrosulphuret be poured into muriatic acid, a viscid substance falls, which is bisulphuret of hydrogen; but if muriatic acid be dropped into a

weak solution, sulphuretted hydrogen is evolved, and sulphur is precipitated.

When sulphur is heated with potassa*, (oxide of potassium,) the results are sulphuret or bisulphuret of potassium and sulphate of potassa: that is, a portion of the potassa communicates a sufficiency of oxygen to part of the sulphur to convert it into sulphuric acid, which uniting with the remaining unaltered potassa, forms sulphate of potassa. The residuary sulphur and the potassium combine to form sulphuret of potassium.

In further illustration of this decomposition, we may suppose *four* proportionals of potassa (48×4) to be acted upon by *four* proportionals of sulphur (16×4), in which case *one* proportional of the sulphur (16) will abstract *three* proportionals of oxygen (8×3) from *three* of the potassa, to form *one* proportional of sulphuric acid (40), which uniting with *one* of potassa (48), will form *one* of sulphate of potassa (40+48=88): and the *three* proportionals of potassium (40×3) will then unite with the remaining *three* of sulphur (16×3) to form *three* proportionals of sulphuret of potassium.

It appears that there are only two sulphurets of potassium permanent at high temperatures, namely the *sulphuret* and the *bisulphuret* above described; but these unite with sulphur by fusion at a moderate heat, apparently indefinitely, though some chemists have assumed that several definite combinations may be obtained. Berzelius, for instance, supposes that there are no less than seven sulphurets of potassium, in which one proportional of metal is combined respectively with 2, 4, 6, 7, 8, 9, and 10 proportionals of sulphur†, but neither his experiments nor analogy sanction such an opinion.

The "potassæ sulphuretum" of the Pharmacopœia, supposing it properly prepared, is then, as above stated, a mix-

* When common caustic potash or hydrate of potassa is fused with sulphur, the water which it contains is decomposed, and its elements evolved in combination with sulphur.

† Annals of Philosophy, N. S. vol. iv. p. 214.

ture of bisulphuret of potassium, sulphate of potassa, and a small excess of sulphur; it is of a dirty yellow colour inclining to olive green, a slightly sulphureous smell, and a nauseous alkaline and bitter taste. Its usefulness is very doubtful, either as an internal or external remedy. Some call it expectorant, others diaphoretic, and others are content with calling it by the universally applicable name of an alterative. It has been prescribed in doses of from two to five grains in pulmonary affections, in rheumatism, and in cutaneous disorders; and is best, united with soap, in the form of pill. Perhaps the only cases which will induce the practitioner to use it are those of obstinate cutaneous eruptions, where other things have been tried in vain. The following may then be prescribed:—

℞ Potassæ Sulphureti,
Saponis duri, āā ℥ss.
Divide in pilulas xxiv., quarum capiat unam quartâ quâque horâ, superbibendo cyathum Decocti Sarsaparillæ compositi.

The following lotion has been recommended in *tinea capitis*:—

℞ Potassæ Sulphureti ℥iij.
Saponis duri ℥ij. Solve in
Aquæ Rosæ f℥vij.
Spiritûs Rectificati f℥j.
Fiat lotio quâ irrorantur maculæ impetiginosæ, mane et vesperi.

An ointment of sulphuret of potassa, containing about half a drachm of the sulphuret, carefully triturated with an ounce of lard or of spermaceti cerate, has been used in the cure of the itch: it appears, however, to possess no advantage over other less disagreeable applications.

As an antidote to poisons, sulphuret of potassa is very properly laid aside. There is no case in which it can be judiciously administered.

Sulphur Lotum. — *Washed Sulphur.*

℞ Sulphuris sublimati libram;

Aquam ferventem superinfunde, ut Acidum, si quod sit, penitùs abluatur; dein sicca.

Take of sublimed Sulphur, a pound;

Pour upon it boiling Water, so that the Acid, if there be any, may be perfectly washed away; then dry it.

In the process of subliming sulphur, a portion is generally acidified, and accordingly the unwashed sublimed sulphur has frequently a sour taste: the object of the above process is merely to wash away this adhering sulphuric acid.

The properties and medical uses of sulphur will be found under that head, in the list of the Materia Medica (see page 177). The virtues of washed sulphur correspond with those already enumerated as belonging to the other forms of this substance.

Sulphur Præcipitatum. — *Precipitated Sulphur.*

℞ Sulphuris sublimati libram,
Calcis recentis libras duas,
Aquæ congios quatuor;

Sulphur et Calcem in Aqua simul coque; tum liquorem per chartam cola, eique instilla Acidi muriatici quantum satis sit ut demittatur Sulphur. Denique hoc, superinfusâ sæpius Aquâ, lava, donec insipidum fiat.

Take of sublimed Sulphur, a pound,
Fresh Lime, two pounds,
Water, four gallons;

Boil the Sulphur and the Lime together in the Water, then filter the liquor through paper, and drop into it as much muriatic Acid as may be necessary to precipitate the Sulphur; lastly, wash the precipitate repeatedly with water till it becomes tasteless.

The mutual action of lime and sulphur corresponds in many points with that of potassa and sulphur*, when they

* In reference to the action of sulphur upon the alkalies and lime, the reader will consult with advantage Vauquelin's memoir in the Annales de Chimie et Physique, tom. xvi. p. 1.

are heated together: under these circumstances sulphuret of calcium and sulphate of lime are produced; there is, however, no bisulphuret of calcium permanent at a red heat.

When sulphur and lime are boiled in water, as directed in the above formula, a compound of bisulphuretted hydrogen and lime is formed, which may be obtained in crystals, composed, according to Mr. Herschel, of 2 proportionals of lime, 2 of sulphur + 1 of hydrogen (forming bisulphuretted hydrogen), and 4 of water: muriatic acid is added to the aqueous solution of this sulphuretted hydrosulphuret of lime, sulphur is precipitated, and sulphuretted hydrogen evolved.

The sulphur thus thrown down is in a state of very minute division, and perhaps retains a little hydrogen and water; but it can scarcely be considered as preferable to common sulphur for medical use, except, perhaps, when it is desired to administer it in draughts or mixtures, and then, being in very fine powder, it blends more readily with liquids than sublimed sulphur.

Precipitated sulphur ought to be entirely volatilised by heat: we frequently find it containing a very large quantity of sulphate of lime, in which case it may be suspected that dilute sulphuric, instead of muriatic acid, has been used in its precipitation.

VEGETABLES.

Vegetabilia.	*Vegetables.*
Decerpenda sunt Vegetabilia ex locis et solo, ubi sponte nascuntur, tempestate siccâ, nec imbribus nec rore madefacta; quotannis colligenda sunt, et quæ diutiùs servata fuerint rejicienda.	Vegetables are to be collected from the places and soil where they grow spontaneously, in dry weather, when they are neither wet from showers nor dew; they are to be collected annually, and those which have been kept longer than a year, are to be rejected.
Radices pleræque effodiendæ sunt antequam caules aut folia exserant.	Most Roots are to be dug up before the stalks or leaves shoot forth.
Cortices colligi debent eâ tempestate, quâ facillimè à ligno separari possint.	Barks ought to be collected at that season when they can be most easily separated from the wood.
Folia decerpenda sunt postquam flores expassi fuerint: et antequam semina maturescant.	Leaves are to be gathered after the flowers are blown; and before the seeds ripen.
Flores legendi sunt nuper explicati.	Flowers are to be gathered recently blown.
Semina colligenda sunt jam matura, et antequam è planta decidere inciperint. Hæc in propriis pericarpiis servari debent.	Seeds are to be collected as soon as they are ripe, and before they begin to fall from the plant. They should be kept in their own seed vessels.

The above are the directions given in the Pharmacopœia, respecting the times and circumstances under which vegetable products are to be collected for pharmaceutical use. They are essentially the same as those long ago laid down by

Linnæus*, and involve some important considerations connected with the growth and functions of plants, of which those who have the direction of a pharmaceutical laboratory should not be ignorant.

The necessity of rejecting the generality of vegetables collected in the preceding year, though sufficiently obvious, is too often unattended to, especially by the wholesale venders of medicinal herbs, to whom apothecaries in general resort for their supplies. In many articles, such as *aromatic plants*, odour and acrimony are greatly impaired by age; but in others of eminent activity, it often happens that the virtue is diminished or entirely lost, and that dangerous uncertainties result from their employment; this happens in regard to hemlock, henbane, and more especially foxglove.

Roots in general are ordered to be dug up in the spring, when their proper juices are most perfect and abundant, and before they are consumed in those changes which take place during the growth of the stem and leaves. They may, however, with equal propriety be collected early in the winter, before the stems have entirely withered away.

* 1. Radices sub veris initium antequam folia prorumpunt effodiendæ.

2. Herbæ decerpendæ cùm flores formantur.

3. Flores prius legendi quam pollen antherarum demittunt.

4. Stipites autumno, quo potiori vi animantur, desumendæ.

5. Turiones colligendi, antequam eorum folia se explicuerint.

6. Cortices ex fructicibus autumnali tempore, ex arboribus autem vernali separandi.

7. Ligna potissimùm tempore hyemali abscindenda.

8. Fructus plerumque colligendi postquam maturuere.

Quod radicum collectionem attinet, semper attendamus ad vegetationem plantæ propriam, atque ex hâc dijudicemus tempus eas eruendi. Earum bonitas inprimis dignoscitur ex cortice et parenchymate. Radices plantarum annuarum maximè evellantur, stirpe jam adultâ, antequam flores ferunt, biennium autumno ejus anni quo seminatæ sunt, decrescente, vel vere proximo. Ceteroquin plantis quibus vivax per plures annos radix inhæret, hanc auferamus, quùm primo vere gemmæ turgere, vel folia, si hæc hyeme decidunt, se explicare videntur. Nec obliviscamur, plures plantas culturâ inefficaciores fieri, ut conium maculatum, quasdam contrà tempore virtute augeri.—(*Pharmacopœia Batava, editione J. F. Niemann*, vol. i. p. 347.)

Barks are directed to be taken at that season at which they easily separate from the wood; that is, with few exceptions, late in the spring or very early in summer for it is at that time that they abound most in sap and in the peculiar secretions of the individual tree: at a later period the *liber* or inner layer of bark becomes converted into a layer of wood, the characteristic properties of the bark are much impaired, and it is with great difficulty removed from the tree.

Leaves are in the greatest perfection at the time of the flowering of the plant; at that period they are found to contain their characteristic products in the greatest abundance; they should be perfectly formed, and on no account beginning to wither, which they in many instances do, when the seeds are about to ripen.

Flowers should, for the same reason, be gathered soon after they expand, and before the pollen falls from their anthers.

Seeds may, in many instances, be very properly preserved, in their own pods, but this is often inconvenient, either from the bulk or liability to moulder of the seed vessel. Some seeds may be kept for a great length of time without undergoing deterioration, especially those which abound in volatile or essential oil; they even retain their vegetative powers for years: others become rancid and unfit for use often in a few months, as the almond, the ricinus seed, and those generally in which fixed oils predominate. Seeds that are abundant in mucilaginous matter, are liable to the attacks of insects and to speedy decay from moisture.

We observe no general connexion in the medical virtues of the different parts of plants. In trees the active principles are commonly most abundant in the bark, for it is there that the perfect sap, after it has been exposed to the action of light and air in the leaves, is accumulated and deposits the peculiar secretions or products of the vegetable. This deposition and accumulation principally goes on in the spring and early part of the summer; hence the propriety of collecting barks at that season of the year, whilst the vessels are full and new layers are forming. Of trees, therefore, the bark is the part in which the medical virtues are chiefly concentrated; the astringent matter of the oak, the aroma and

bitterness of cascarilla, the peculiar salifiable principles of the various species of cinchona, and the bitter acrimony of cusparia, are all found in the respective barks of those vegetables, which, therefore, are the parts directed for officinal use.

In herbaceous plants the root is the part in which their most active principles are frequently concentrated, as we see in gentian, jalap, liquorice, hellebore, and rhubarb. In other cases the roots are inactive, and the virtue resides in the leaves, as in hemlock, digitalis, senna, savine, and rue; and in others the seeds partake of some activity, as those of colchicum; while the seeds of the poppy are bland and inert. The aroma of these plants is usually associated with the essential oil of the leaves, of the flowers, or of the fruit and seeds, as in the different species of mint, in lavender and chamomile, in the orange and lemon, and in caraways, cardamoms, &c.

It is seldom that medical virtue or activity pervades every part of the plant: that part therefore in which it chiefly resides, and from which it is most certainly and easily obtained, should be in preference selected as officinal; and the Materia Medica should not be encumbered, as of old, with inert, uncertain, and redundant articles. If any part of the marshmallow is retained, it should be the root only; the berries or imperfect fruit of the orange tree are quite superfluous; so are the seeds of hemlock, of digitalis, and henbane: the wood of the guaiacum tree only derives virtue from containing a little of the resin; the former therefore is uselessly kept upon the list of the articles used in medicine.

OF THE PRESERVATION AND PREPARATION OF VEGETABLES.

Vegetabilium Præparatio. *Preparation of Vegetables.*

Vegetabilia, brevi postquam decerpta fuerint, illis exceptis quæ recentia esse

Vegetables, shortly after they are gathered, excepting those which ought

oportet, leviter strata, quàm citissimè exsicca, calore tam leni ut color non mutetur; dein in locis, vel vasis aptis, intercluso luminis et humoris accessu, conserva.

Radices, quas recentes servari præcepimus, in arena sicca reconde. Scillæ Radicem ante exsiccationem, tunicis aridis direptis, transversim in laminas tenues seca.

Fructus pulposos, si immaturi sint vel maturi et sicci, sepone in loco humido, ut mollescant; dein pulpas per cribrum setaceum exprime; postea coque lento igne, crebrò movens; denique aquam balneo aquoso consume, donec pulpæ fiant idoneæ crassitudinis.

Cassiæ Lomentis contusis aquam ferventem superinfunde, ut pulpa eluatur, quam per cribrum grandioribus foraminibus primùm exprime, postea per setaceum; deinde aquam balneo aquoso consume, donec pulpa idoneam crassitudinem habeat.

Fructuum maturorum et recentium pulpam vel succum per cribrum exprime, nullâ coctione adhibitâ.

Opium à rebus alienis, præsertim externis, quam diligentissimè separa. Servetur Opium *molle*, quod ad pilulas fingendas aptum sit, et *durum*, quod balneo aquoso ita exsiccatum fuerit, ut in pulverem teri possit.

Gummi-Resinæ pro optimis habendæ sunt, quæ electæ fuerint adeo sinceræ, ut nullâ purificatione opus sit. Quòd si minus puræ esse videantur, coque in aqua, donec mollescant, et prelo exprime per pannum

to be used fresh, should be lightly spread, and dried as quickly as possible by the aid of so gentle a heat that their colour may not be changed. They should then be kept in places or convenient vessels, excluded from light and moisture.

Lay up those Roots, which we have directed to be kept fresh, in dry sand. Cut the root of the Squill, before it is dried, into thin transverse slices, previously peeling off the dry layers.

Put pulpy Fruits, if unripe, or if ripe and dry, in a moist place to soften: then press the pulp through a hair-sieve; boil it afterwards over a slow fire, frequently stirring it; lastly, evaporate the water by a water-bath, until the pulps have acquired a proper consistency.

Pour boiling water upon the bruised Cassia Pods, so that the pulp may be washed out; press this first through a coarse sieve, and afterwards through a hair-sieve; then evaporate the water on a water-bath until the pulp has a proper consistency.

Of fruits that are ripe and fresh, press the pulp or juice through a sieve, without boiling.

Separate Opium very carefully from all extraneous substances, especially from those which are external. Let Opium be kept *soft*, fit to form pills; and *hard*, by so drying it on a water-bath, that it may be reduced to powder.

Those Gum-Resins are to be preferred, which can be selected so clean as to require no purification. If, however, they appear to be impure, boil them in Water until they soften, and squeeze them in a press through

cannabinum; dein sepone, ut pars resinosa subsidat. Liquorem supernatantem effusam balneo aquoso consume, adjectâ sub finem parte resinosâ, ut cum parte gummosâ in unum coeat.

a hempen cloth; then set them by, that the resinous part may subside. Pour off the supernatant liquor, evaporate it by the aid of a water-bath, and towards the end of the evaporation mix the resinous part intimately with the gummy.

Gummi-Resinæ facile liquescentes purificari possunt, injiciendo in vesicam bubulam, tenendoque in aqua fervente, donec adeò molles fiant, ut per pannum cannabinum à sordibus prelo separari possint.

The easily fusible Gum-Resins may be purified by putting them into an ox bladder, and keeping them in boiling Water until they become soft enough to be separated from their impurities by pressing through a hempen cloth.

Styracis Balsamum in Spiritu rectificato liqua, et cola; tum leni calore destillet spiritus, donec idonea crassitudo Balsamo fiat.

Dissolve Storax Balsam in rectified Spirit, and strain; then let the Spirit distil over by the aid of a gentle heat until the Balsam has acquired a proper consistence.

Upon these subjects the directions of the London Pharmacopœia are perhaps rather too concise. The temperature at which vegetable substances are dried for pharmaceutical use, should rarely fall short of 100°, nor should it ever exceed 212°. For such operations the heat of steam is preferable to any other, as under common pressure it can never be so raised as materially to injure the vegetable; whereas drying stoves heated by flues, or, as is often the case, by iron chimneys traversing them, are liable to become so hot, as more or less to parch and decompose the substances that are merely intended to be desiccated. In constructing drying stoves the greatest attention should be paid to their thorough ventilation; fresh and warmed air should be abundantly admitted from below, and there should be a corresponding series of apertures above, to carry off the heated air and the vapour from the goods that are drying. In some few instances, drying in the open air and sunshine is to be preferred to other methods; but light discolours and probably affects the medical efficacy of some plants, which, therefore, under such circumstances, require to be kept from the light, and dried by artificial heat.

If roots are to be preserved fresh, moist, and not dry, sand

is the best material to bury them in. The only root directed by the Pharmacopœia to be thus kept, is that of colchicum, but a better method of preserving it in an uniform and active state consists in cutting it into thin slices, and very carefully drying them in the usual way. Squills should be cut transversely into very thin slices, and these rapidly but cautiously dried until they become brittle and easily reducible to powder. The dried root should be kept in a dry and warm place, for in a damp air it becomes tough and often mouldy, and loses much of its acrimony: this also happens to the powdered squill, which should be used freshly pulverised, and should be prepared in small quantities at a time; or, if in larger, should be excluded from air and moisture.

The pulpy parts of fruits retained in our present Materia Medica, are those of the tamarind and cassia pod, of the dog-rose, and of prunes, to none of which, nor indeed to any others, can the directions of the Pharmacopœia be applied. The usual mode of obtaining the pulpy part of such fruits as have become dry and indurated, consists in softening them by exposure to steam, or by a small quantity of boiling water, until they admit of being rubbed through a proper sieve; in short they are to be treated nearly in the same way as is directed for the extraction of the pulp of cassia pods.

Opium, when it has been cleansed from adhering and extraneous substances, should be dried in a temperature below 212°, until it no longer loses weight; it then becomes sufficiently hard to admit of being powdered and sifted, in which state only it should be used for pharmaceutical preparations and medical prescriptions. In the *soft* state adverted to in the above directions, the quantity of water which it retains is very variable, and materially affects the virtues of an article of so much activity. In prescribing opium in pills, therefore, it is better to use the *pulvis opii* with a sufficiency of mucilage of gum arabic or of conserve of roses, than to rely upon the *opium molle* which the Pharmacopœia reserves for that purpose.

The gum resins directed for medical use in the present Pharmacopœia are ammoniacum, assafœtida, gamboge, euphorbium, galbanum, olibanum, opoponax, sagapenum, and scammony: these may generally be procured sufficiently free

from impurities for medical use; but as the virtues of several of them depend principally upon the volatile oil which they contain, the process of softening them in boiling water until they admit of being pressed through hempen cloth, would manifestly injure them; while upon others such a process cannot in any way be performed, as they are hardened by the above temperature. The best mode of cleansing ammoniacum, assafœtida, and galbanum, is to pulverise and sift them in very cold weather; the powder afterwards agglutinates, which is of no consequence.

Storax, even approaching to a genuine state, is very rarely indeed to be found, except in the cabinets of the curious: when pure, it of course requires no purification; and when impure, the process above directed is inefficient, for it is adulterated with substances soluble in alcohol.

EXPRESSED OILS.

The expressed vegetable oils employed in English pharmacy are those of the almond, of linseed, and castor seed, of the olive, of the seeds of the croton tiglium, and of nutmegs. They are all fluid at common temperatures, with the exception of the oil of nutmeg, which is solid, and in the form usually called a *vegetable butter*. Olive oil, almond oil, and linseed oil, are bland, and almost inert; castor oil is mildly aperient; croton oil virulently purgative; and oil of nutmeg is useless as a medicine, being only employed in one preparation for external use, probably on account of the odour that it derives from adhering essential oil.

These oils are insoluble in water, but more or less soluble in alcohol and in ether. When intended for internal use, they are frequently blended with, or diffused through, water, by trituration with mucilage of gum arabic, or with yolk of egg. For this purpose the mucilage should not be too thick, and the oil gradually added to it under constant trituration, so as to form a glossy and uniform mixture, to which the requisite portion of water may afterwards be by degrees added. Fixed

oils become rancid and thick by age, and in that state are unfit for medical use; the seeds from which they are obtained should also be fresh, and they should be expressed without the aid of heat. They should be kept in cellars, or places which, though cool, are not cold enough to allow of their congelation *.

Oleum Amygdalarum. — *Oil of Almonds.*

Amygdalas vel dulces vel amaras, in Aqua frigidâ macera per horas duodecim, et contunde; deinde, nullo calore adhibito, Oleum exprime.

Macerate either sweet or bitter almonds in cold Water for twelve hours, and bruise them; then, without employing heat, express the Oil.

Unless the almonds are dirty or dusty, no benefit is obtained by the maceration in cold water; they should be finely bruised, and under due pressure, without the aid of heat, they yield nearly half their weight of oil, which at first is somewhat turbid, but becomes clear by deposition, or may easily be obtained so by filtration through coarse paper in a warm room. The oil is then of a very pale greenish straw colour, insipid, and inodorous, whether obtained from sweet or from bitter almonds, the essential oil and prussic acid of the latter remaining entirely in combination with the mucilaginous and other ingredients that compose the cake from which the fixed oil has been abstracted (see page 23). It is said that the expressed oil of the bitter almond has less tendency to become rancid than that of the sweet, and for the same reason the oil expressed without heat is preferred.

* In respect to the presses used in the pharmaceutical laboratory for the expression of fixed oils and other purposes, great advantage will be found in the use of what is commonly called the *hydraulic press*, in respect to saving time and power; compared with these the screw-presses, worked by hand, are very ineffective and inconvenient. A good hydraulic press of a sufficient power, with all the necessary apparatus for pharmaceutical purposes, may be purchased at an expense of about £200.

The medical uses of almond oil correspond with those of olive oil, and have already been noticed in describing their sources, in the Materia Medica (pages 21 and 122), where also will be found some formulæ for their administration.

Almond oil, though aperient in large doses, is scarcely employed with that view, and is only used in emulsions and other demulcent formulæ. In addition to those already given at page 3, at the bottom of page 24, and at page 116, the following will be found useful in allaying the tickling and irritating cough consequent upon catarrh :—

℞ Conservæ Rosæ Caninæ ℥ij.
Syrupi Papaveris f℥ss. tere simul et adde gradatim,
Olei Amygdalarum f℥ss.
Misce optimè ut fiat linctus cujus sumatur cochleare unum minimum subinde.

The almond cake from which the oil has been expressed, when finely pulverised, furnishes *almond meal*, an excellent basis for *hand powders*, especially when of bitter almonds.

℞ Farinæ Amygdalarum ℥xij.
Saponis pulverisati ℥iij.
Benzoini Pulver. ℥j.
Fiant pulvis detergens manualis.

Oleum Lini. — *Linseed Oil.*

Lini usitatissimi Semina contunde; deinde, nullo calore adhibito, Oleum exprime.

Bruise the Linseed; then, without using heat, express the Oil.

Linseed oil is scarcely ever expressed in the pharmaceutical laboratory; for the purposes of pharmacy it is employed as met with in commerce, the seeds having been considerably heated previous to expression. It is gently aperient, but rarely used internally on account of its very unpleasant flavour. As an external application, it is employed in extensive burns and scalds, sometimes mixed with lime-water,

and sometimes with the addition of oil of turpentine. The following is the common "linimentum oleosum" of the London Hospitals, applicable in these cases:—

℞ Olei Lini f℥iss.
Liquoris Calcis f℥iij. M.

But the following liniment, upon Mr. Kentish's principle, is to be preferred:—

℞ Olei Lini f℥iv.
Olei Terebinthinæ f℥ij.
Misce. Fiant linimentum partibus affectis applicandum.

It is above all things important in cases of extensive burns or scalds to apply a remedy of this kind immediately upon the occurrence of the accident; much pain is thus prevented, and what is more important, the extent of the subsequent vesication is generally much diminished, and the cure proportionately accelerated. If on such occasions oil of turpentine cannot immediately be procured, spirit of wine, gin, rum, or brandy, should be applied.

Linseed oil is a good addition to poultices, and upon the same principle *linseed meal* is employed; but the latter is usually the powdered cake from which the oil has been expressed, and is a very inferior article to freshly powdered linseed, the greasiness of which contributes to the permanent softness required in a mollifying poultice.

Cold drawn linseed oil has but little taste and colour, but it soon acquires a very rancid flavour, and becomes more disagreeable than that which has been expressed at a higher temperature. 1 cwt. of linseed yields from 18 to 20 lbs. of such oil.

Oleum Ricini. — *Castor Oil.*

Ricini Semina, demptis pelliculis, contunde; deinde, nullo calore adhibito, Oleum exprime.

Having taken off the outer coat of Castor Seeds, bruise them; then, without using heat, express the Oil.

The British market is almost exclusively supplied with this oil from the East Indies: it is of a very pale yellow colour, and has but little smell or taste, both of which are, however, nauseous and disagreeable: it is very slightly acrid upon the palate. Its medical uses have been described above, under the article "Ricini Oleum et Semina," in the Materia Medica, and formulæ for its exhibition will be found at pages 116, 138, and 150.

The castor oil, as formerly imported from the West Indies, is deep coloured, rancid, and more purgative than the former, and is not fit to be used where the other can be obtained. When expressed in this country, the seeds have generally become rancid, and the oil is disagreeable, and sometimes drastic, for it is not easy to free the seeds from their external husks, in which, as has already been remarked, a virulently purgative substance resides.—(See page 149.)

Olea Destillata.

OLEUM ANISI,
ANTHEMIDIS,
CARUI,
JUNIPERI,
LAVANDULÆ,
MENTHÆ PIPERITÆ,
MENTHÆ VIRIDIS,
ORIGANI,
PIMENTÆ,
PULEGII,
ROSMARINI.

Anisi et Carui Semina, Anthemidis et Lavandulæ Flores, Juniperi et Pimentæ Baccæ, Rosmarini Cacumina, et reliquorum Herbæ recentes, adhibenda sunt.

Horum quodvis in alembicum immitte, et Aquæ adjice quantum id

Distilled Oils.

OIL OF ANISE,
CHAMOMILE,
CARAWAY,
JUNIPER,
LAVENDER,
PEPPERMINT,
SPEARMINT,
MARJORAM,
PIMENTA,
PENNYROYAL,
ROSEMARY.

The seeds of Anise and Caraway, the Flowers of Chamomile and Lavender, the Berries of Juniper and Pimenta, the Tops of Rosemary, and the fresh Herbs of the rest, are to be employed.

Put a portion of these into an alembic, and add as much Water as

contegat; tum in vas frigidarium amplum destillet Oleum.

Aqua, quæ inter destillandum cum Oleis Carui, Menthæ piperitæ, et viridis, Pimentæ, et Pulegii prodit, in usum servetur.

will cover it, then let the Oil distil over into a large refrigeratory vessel.

The Water which distils over with the Oils of Caraway, Peppermint, Spearmint, Pimenta, and Pennyroyal, is to be kept for use.

To the above list of officinal distilled oils are to be added the following, which will be found in the list of the Materia Medica, as being almost exclusively imported from abroad, viz.—

OIL OF CAJUPUTI,
CLOVES,
CINNAMON,
LEMON PEEL.

Oil of Aniseed is not frequently distilled in this country, by far the larger proportion of that which is here consumed being imported chiefly from Spain, of a good quality, and a much lower price than that at which it can be prepared at home. Some of its uses and properties have already been described (p. 26). It is a warm carminative and antispasmodic, less stimulating than the generality of these oils, and as such is occasionally added to pills and powders in cases of flatulency and colic. The oil distilled in this country, from select seeds, is somewhat more fragrant and agreeable than the foreign.

Oil of Chamomile has a disagreeable odour, and a pungent nauseous taste: antispasmodic powers have sometimes been attributed to it, and hence it is occasionally added to purging pills, with a view to prevent griping. The dose is from three to six drops. The following pills have been found useful in indigestion attended with spasmodic pain of the stomach, flatulency, and tendency to costiveness:

℞ Pulveris Rhei 3ss.
Alöes Spic. Extr. gr. x.
Olei Anthemidis ♏xxx.
Divide in pilulas decem, quarum sumatur una ante prandium et vespere quotidie.

Oil of Caraway Seed is very warm and pungent, and of an agreeable flavour. A few drops are frequently incorporated with pill masses to prevent flatulency, and it is sometimes added to powders for the same purpose, and to cover unpleasant flavours, as in the following purgative:—

℞ Jalapæ Pulver. gr. x.
Scammoniæ Pulv. gr. v.
Potassæ Sulphatis ʒj.
Olei Carui ɱv.
Fiat pulvis purgans ex aliquo vehiculo idoneo sumendus.

A liniment, containing this oil, has been recommended (not probably on good grounds) as an application to the abdomen in flatulent colic.

℞ Unguenti Cetacei ℥j.
Olei Carui,
Tincturæ Opii, āā fʒj.
Misce. Fiat Linimentum Carminativum.

Oil of Juniper Berries. Under the article "Juniper Baccæ" in the Materia Medica, the principal uses of this oil are detailed; and to it the diuretic action and virtue of the berries may be solely ascribed. It is very sparingly soluble in alcohol.

Oil of Lavender Flowers. Some account of the sources and properties of this oil will be found at page 110. Its principal use is as a perfume (see *Spiritus Lavendulæ*), and it is rarely used internally, though once much celebrated for its anti-nervous efficacy. Added to ointments containing sulphur, it tends considerably to disguise the odour of that substance.—(See *Unguentum Sulphuris.*)

Oil of Peppermint. The average produce of this oil from a given quantity of herb, and its general properties, have been adverted to under the head "Mentha Piperita," in the Materia Medica. It is a powerful and useful stimulant and cordial, pungent upon the tongue, and leaving a peculiar sensation of coldness. In spasmodic and flatulent pains of

the stomach and bowels, in cramp, faintness, and nausea, it is a favourite remedy, a drop or two being taken upon a lump of sugar, or triturated with a little powdered sugar. *Peppermint drops* are a common and convenient domestic form for the administration of oil of peppermint: they are made as follows. Four ounces of white sugar in fine powder are put into a bright copper ladle, made shallow and with a lip to it, and constantly stirred over a clear charcoal fire, till so hot as not to be borne by the hand. Twenty-four minims of oil of peppermint, and half a fluid ounce of peppermint water, are then added, and the whole rapidly stirred together, till of such consistency as barely to admit of being dropped out by the assistance of a spatula, upon a piece of polished marble, where the drops speedily harden, and are afterwards to be dried in a very gentle heat. *Peppermint lozenges* are a mixture of starch, sugar, and mucilage of tragacanth, flavoured with oil of peppermint.

Oil of Spearmint is applied to the same purposes as oil of peppermint, but is considerably more expensive, and of a less agreeable flavour. From two to five drops may be given with a little sugar.

Oil of Marjoram. This is an acrid and pungent oil of an agreeable odour, the use of which is confined to external applications; it is very rarely employed. The average produce of essential oil from this herb is 1lb from 2 cwt.; but, as in other cases, it varies exceedingly with the season and the culture of the plant.

Oil of Pimenta has the pleasant odour and taste of allspice, and is occasionally added to pills or powders, with a view to prevent flatulency and spasm, or to conceal disagreeable flavours. The quantity of essential oil obtained from a given weight of pimenta berries is very various: it fluctuates between one twentieth and one hundredth part.

Oil of Pennyroyal is now scarcely used; it once had considerable reputation as an emmenagogue, and is occasionally added, under that intention, to aloetic and chalybeate pills. The fresh herb yields on an average from one one-hundred-and-twentieth to one one-hundredth of its weight of oil.

The uses of the other officinal essential oils will be found

under their respective heads, in the list of the Materia Medica.

The essential or volatile oils have, like the fixed oils, hydrogen, oxygen, and carbon for their ultimate elements: in their relative proportions, hydrogen and carbon appear predominant, and they contain a smaller relative quantity of oxygen than the fat or fixed oils. Various experiments have been made to determine the exact proportions of carbon, oxygen, and hydrogen, contained in these bodies, but the results of different experimentalists are too much at variance to admit of any satisfactory deductions. Dr. Ure analysed very carefully purified oil of turpentine, with the following results:—

Carbon	84.9
Hydrogen	11.5
Oxygen	3.6
	100.*

The following ultimate elements of castor oil are subjoined from the same authority, by way of comparison:—

Carbon	74.00
Hydrogen	10.29
Oxygen	15.71
	100.†

Essential oils are, with few exceptions, obtained during the distillation of the part of the plant which affords them with water, in which they are but sparingly soluble, so that the greater portion of the oil is collected either floating upon, or at the bottom of the water, according to its specific gravity,

* Dictionary of Chemistry, 2d edit. p. 800. † Ibid. p. 801.

some being heavier, but the greater number lighter than that liquid, as shewn in the following table:—

Specific Gravities of the Officinal Essential Oils.

Oil of Aniseed (English)	.9868
——— (Foreign)	.9903
——— Cajuputi	.9263
——— Caraway	.9310
——— Chamomile (English, from flowers only)	.9083
——— (Foreign)	.9289
——— Cinnamon	1.036
——— Cassia	1.071
——— Cloves	1.052
——— Juniper (English)	.8688
——— (Foreign)	.8834
——— Lavender (English, from flowers only)	.8960
——— (from the whole herb)	.9206
——— Lemonpeel	.8569
——— Marjoram	.9090
——— Pennyroyal	.9390
——— Peppermint	.9070
——— Pimenta	1.021
——— Rosemary	.9118
——— Spearmint	.9394
——— Turpentine	.8700

The produce of essential oil from herbs is in most cases not materially affected by drying them; in some instances, the odour and quality of the oil is ameliorated, in others deteriorated, by their previous desiccation: they are, however, commonly used in their fresh or recent state by the great distillers of essential oils in the neighbourhood of London, by whom the pharmaceutical market is largely supplied. The still and refrigeratory should be capacious, and a sufficiency of water should be used to cover the vegetable, previously cut into pieces or bruised, and not more than to fill two-thirds of the boiler. The fire should be moderate, and care should be taken to prevent empyreuma, and also to avoid the boiling up of the materials into the still-head: distillation by the heat imparted by steam under moderate pressure is here preferable to all other methods. The process should be continued as long as the water comes over flavoured by the vege-

table, and may be put a stop to when it becomes nearly insipid. It is generally, in cases where the oil is lighter than water, suffered to run into a recipient of glass, having a pipe issuing from near its bottom, like the spout of a teapot, and of such height as to suffer the water to run off before it is quite full: the oil remains in the vessel, and ultimately fills it. If the oil be heavier than water, it is collected in a vessel, the waste water pipe of which issues from its upper part, so that the oil, sinking, remains in it until full. The oil and water may afterwards be more completely separated, either by a siphon, or by a separatory funnel. The water which in this process distils over with the oil should be retained for a second distillation with the herb, inasmuch as it already is saturated with its essential oil, and consequently the product in oil of the subsequent, will be greater than that of the first distillations. When dry seeds are used as the source of essential oils, they are sometimes steeped for several hours in water, previous to distillation; so also are cloves, cinnamon, and allspice; and a portion of salt is sometimes put into the still in order to elevate the boiling point of the water: but these are very unnecessary proceedings.

The essential oils are also called *volatile oils*, in consequence of the readiness with which they rise in distillation along with the vapour of water; but when they are distilled *alone*, a process sometimes had recourse to under the erroneous idea of rectifying or purifying them, it is found that they require a higher temperature considerably than 212° for their evaporation, and that they suffer a manifest deterioration and change; they deposit resinous matter, become less odorous, and less volatile: if therefore distilled with a view to their purification and improvement, they should always be mixed with water. Many of these oils contain camphor, and several of them benzoic acid, which substances they sometimes deposit spontaneously in crystals. Exposed for a long time to light, they generally become pale or colourless, and in the contact of air they acquire viscidity, and some of them assume resinous characters. They are almost all perfectly soluble to any extent in alcohol and in ether: the alcoholic solutions are often known under the name of *essences*. They are sometimes adulterated with alcohol, which may be separated

by agitating them with water, and its quantity appreciated by the diminution of bulk which they thus suffer: this adulteration is also manifested by a slight increase of temperature ensuing when they are thus mixed with water, and which is not observed in the case of pure essential oil. Their adulteration with fixed oils is very readily detected by the greasy stain which they in that case leave when dropped upon paper and held near the fire; after the evaporation of the pure oil, under such circumstances, there only remains a slight discoloration, which may be written over with a pen and ink, not being of a greasy nature.

Some essential oils are obtained by mere pressure, as those of lemon, orange, and bergamotte, which exist in vesicles in the rind of the ripe fruit; others are of so delicate a nature as to be impaired or decomposed even by the most careful distillation, such as those which confer odour upon the flowers of jasmine, and of the tuberose. These are only valued as perfumes, and are procured for that purpose by steeping the flowers in some perfectly pure and inodorous fixed oil, which abstracts the odorous principle of the flower, and from which it may be transferred to alcohol, so as to form a spirituous essence. The same perfume cannot be obtained either by steeping the flowers in alcohol, or by distilling them either with it or with water.

In the Materia Medica, the essential oils rank among the more powerful stimulants, and as such they are both externally and internally employed. In addition to the modes of prescribing them already adverted to, some Pharmacopœiæ direct them in powders blended with sugar; but these should be left to extemporaneous prescription, in consequence of the loss of power and of flavour which they sustain when kept, even for a very short time. They have been called *elæosacchara*, and are usually prepared by triturating together in a mortar half a drachm of the essential oil, with an ounce and a half of powdered white sugar.

Oleum Succini. — *Oil of Amber.*

In alembicum immitte Succinum, ut destillent balneo arenæ, calore

Put Amber into an alembic, so that from a sand-bath gradually

paulatim aucto, Liquor acidus, Oleum, et Sal oleo inquinatus. Dein, iterùm et tertiò Oleum destillet.

heated, an acid Liquor, an Oil, and a Salt contaminated by the Oil, may distil. Then let the Oil be distilled a second and a third time.

The *salt* mentioned in this formula is impure succinic acid, now properly rejected from pharmacy. The oil is at first very brown and thick, but by redistillation it is in some measure purified, becoming thinner, and of a paler colour. Both the acid and the oil are the products of the action of heat upon the amber, and did not pre-exist in it. Rectified oil of amber has a pungent acrid taste, and a peculiar but not very unpleasant odour; it is insoluble in water, and sparingly soluble only in alcohol, partaking, in some of its characters, of the chemical properties of certain species of bitumen. This oil, in doses of from five to fifteen minims, was once highly esteemed as an antispasmodic stimulant, and as such often prescribed in hysterical and convulsive affections, either in pills, or diffused by the aid of mucilage or of yolk of egg, in any aromatic water. It is now scarcely ever used except in the form of a liniment; and as it appears to possess no peculiar efficacy beyond that of a stimulant, its strong odour is against its employment. The following liniment, rubbed upon the chest two or three times a day, is by some recommended in whooping-cough: —

℞ Spiritûs Camphorati,
Tincturæ Opii,
Olei Succini, āā f℥ss.
Fiat linimentum.

A celebrated empirical remedy for this disease, known under the name of *Roche's Embrocation*, is said to be composed as follows:—

℞ Olei Succini,
Olei Caryophillorum, āā f℥ss.
Olei Olivæ f℥j.
Misce. Fiant embrocatio.

Oleum Terebinthinæ Rectificatum.	*Rectified Oil of Turpentine.*
℞ Olei Terebinthinæ octarium, Aquæ octarios quatuor; Destillet Oleum.	Take of Oil of Turpentine, a pint, Water, four pints; Let the Oil be distilled.

Oil of turpentine, as it comes into the market from the wholesale manufacturer, is generally sufficiently pure for all pharmaceutical purposes; should this not be the case, the above process may be resorted to: the residue is usually a little resinous matter.

The medical uses of this oil are described above, under the article "Terebinthina vulgaris," in the Materia Medica, and its excellence as an application to burns and scalds has been noticed at page 336. In chemical properties, oil of turpentine differs from the essential oils; it is very sparingly soluble in alcohol, whereas the turpentine whence it is obtained dissolves with facility in that menstruum. The other essential oils are for the most part readily soluble in it, and it is not unfrequently used in their adulteration. An article known to painters under the name of *oil of spike*, is generally a mixture of the essential oils of lavender and turpentine. It dissolves camphor, and the solution furnishes a useful stimulating liniment.

DISTILLED WATERS.

The medicated distilled waters may generally be regarded as aqueous solutions of the essential oils: some of them, therefore, are warm and stimulating; others are merely used for the sake of their odour or perfume. Those now retained in the London Pharmacopœia are amply sufficient for medical use, but they are extremely few in number compared with those formerly employed, and even at present directed to be kept in foreign Pharmacopœiæ. It was once customary to

have a distilled water of every odorous vegetable, and of many that are inodorous, and contain no volatile principle; such were the *aqua lactucæ, centaurei, cardui benedicti, papaveris rhœados*, and many others now extant in the Parisian *Codex Medicamentarius*.

In the following list of distilled waters, those from aromatic herbs are directed to be obtained either from the recent or the dried herb, or an equivalent portion of the essential oil of the plant is substituted. Where the recent herb is used, twice the weight of that in the dried state is prescribed, and it is in most cases immaterial which is employed, though the distilled water from the dried herb is generally more fragrant and keeps better than the former. The tendency of distilled waters to decompose and become sour, appears in some instances to depend upon vegetable matter, perhaps mucilaginous, carried over in distillation, and is therefore less likely to occur where dry vegetables are used than where they are employed fresh; and still less where the essential oils are employed. Even in the latter case, however, the oil and water appear sometimes to react upon each other, and their qualities are slowly changed; so that the distilled waters should be frequently freshly prepared, and those which are spoiling rejected.

In these distillations the still should not be more than two-thirds full, and the relative quantity of the water to that of the herb, or other material, should be such as that there may be a sufficiency remaining after the operation effectually to prevent empyreuma. In consequence of the extreme variety in the quantity of essential oil contained in the same kind of vegetable at different times, it is impossible to predetermine the quantity of the distilled water which may be drawn off; this should be left to the operator, who may continue the distillation until the odour and taste of the water have very perceptibly diminished.

Recently distilled waters are apt to have a peculiar and somewhat disagreeable odour, commonly called *smelling of the still*, which they lose by short exposure to air, or by keeping for a few days, especially at a low temperature. They should be preserved in stone bottles placed in a cool cellar, and the supernatant essential oil should in most cases

be removed. Sometimes the addition of a little alcohol prevents these waters from becoming vapid and sour; in other cases it seems rather to accelerate those changes: the London College, however, directs five fluid ounces of proof spirit to be added to each gallon of the distilled waters; an unnecessary addition, and, in the case of rose-water, often very inconvenient.

Aqua Destillata.	*Distilled Water.*
℞ Aquæ congios decem;	Take of Water, ten gallons;
Destillent primùm octarii quatuor, quibus abjectis, destillent congii quatuor. Aquam destillatam in lagena vitrea serva.	First distil four pints; these being thrown away, distil four gallons for use. Keep distilled Water in a glass bottle.
Aquarum quæ sequuntur singulis congiis adjice Spiritûs tenuioris fluiduncias quinque, ut integræ conserventur.	To each gallon of the following Waters, add five fluid ounces of proof Spirit, for the purpose of preventing their decomposition.

Common water invariably contains more or less of foreign matter, from which it may be freed by the process of distillation: any volatile substances come over with the first portions, which are therefore ordered to be rejected, and the fixed and saline contents are retained by that which remains in the still. The impurities most commonly occurring in river water, independent of those which are merely diffused through and not dissolved in it, are common salt and sulphate of lime; the latter is usually very abundant in the water of the superficial springs in and near London, but the water of the deep and overflowing wells is often entirely free from it, and sometimes contains little else than traces of common salt and carbonate of soda.

A common and useful test of the general purity of water is a solution of soap in alcohol: dropped into distilled water, it occasion no turbidness; in those purer spring and river waters which are soft and fit for washing, it occasions only a slight opalescence; hard water it renders milky and turbid,

and occasions in it a white precipitate. To judge of the nature of the saline matter which water holds dissolved, other tests must be resorted to. The precipitate occasioned by nitrate of silver, usually indicates common salt; the presence of sulphates is shewn when muriate of baryta occasions a white cloud; and lime is announced by a similar appearance on dropping a solution of oxalate of ammonia into the water. The presence of carbonate of soda may be suspected in water, which, when evaporated to about one-tenth its original bulk, changes the yellow colour of paper stained with turmeric, to brown. By pure distilled water, none of the above tests are affected.

Distilled water is always vapid and disagreeable, but it often also has a foreign flavour derived from the still, and which it is almost impossible to avoid, unless a still and condenser be kept exclusively for it. Where this cannot be done, the best mode of cleansing the apparatus consists in driving steam for half an hour through the condensing pipe, having previously emptied the worm-tub.

Though the use of distilled water is unnecessary in the greater number of medical prescriptions, there are some in which its employment is very essential, as where solution of nitrate of silver, or of acetate of lead, or corrosive sublimate, is employed, and generally where small quantities of very active remedies are to be administered in a dissolved state, or to be externally applied, as in collyria. In such cases, where distilled water is directed, common water is too frequently substituted: hence the advantage of prescribing some of the medicated waters in such cases, which, except in very gross instances of neglect *, must have been distilled.

Aqua Anethi. — *Dill Water.*

℞ Anethi Seminum contusorum libram; [Take of Dill Seeds bruised, a pound;

* Sometimes a few drops of essential oil upon a lump of sugar, dissolved in common water, is substituted for the proper distilled water; and rose water is often manufactured upon the same principle, by adding a little *esprit de rose* to common water.

His affunde tantum Aquæ, ut, post destillationem, supersit quod satis sit ad prohibendum empyreuma. Destillet congius.

Pour upon them such quantity of Water, that, after distillation, enough may remain to prevent empyreuma. Let one gallon distil over.

This is the most useful of the aromatic waters in relieving flatulency and hiccup in very young children, to whom a dessert-spoonful may be given occasionally. It is also a good vehicle for small doses of the saline aperients and of magnesia.

Dill water, very recently distilled, has almost always a peculiar nauseous flavour, which it loses on keeping, provided it has been distilled from clean and healthy seeds, the selection of which requires attention.—(See *Anethi Semina*, in the Materia Medica.)

Aqua Carui. — *Caraway Water.*

℞ Carui Seminum contusorum libram;

His affunde tantum Aquæ, ut, post destillationem, supersit quod satis sit ad prohibendum empyreuma. Destillet congius.

Take of Caraway Seeds, bruised, a pound;

Pour upon them so much Water, that, after distillation, a sufficiency may remain to prevent empyreuma. Distil one gallon.

This water is almost rendered superfluous by the preceding; its flavour is, however, upon the whole, more agreeable than that of dill water, and it is more efficient in covering the taste of some nauseous remedies which may be blended with, or dissolved in it.

In the distillation of this and of the preceding water, there usually remains floating upon it so large an excess of essential oil, as to lead to the supposition that the relative proportion of seed directed to be employed is too large; but, if we use a smaller quantity, although we still find excess of oil, the water is very deficient in flavour; the above proportions ought, therefore, to be retained.

Aqua Cinnamomi.

℞ Cinnamomi Corticis contusi libram,
vel
Olei Cinnamomi *pondere* scrupulos quinque;

Oleo, vel Cortici in aqua per horas quatuor et viginti macerato, affunde tantum Aquæ, ut, post destillationem, supersit quod satis sit ad prohibendum empyreuma. Destillet congius.

Cinnamon Water.

Take of Cinnamon Bark, bruised, a pound, *or*
Oil of Cinnamon, *by weight*, five scruples;

Upon the Oil, or upon the Bark macerated in Water for twenty-four hours, pour such a quantity of water, that, after the distillation, enough may remain to prevent empyreuma. Let one gallon be distilled.

This is a very fragrant and pleasant aromatic water; it has the sweetness and pungency of cinnamon without its astringency, and is a good vehicle for concealing the flavour of many nauseous remedies. It is, however, a heating and stimulating water, and therefore requires, in many instances, to be so diluted as to enable us to avail ourselves of its pleasant flavour only, while at other times it is used as a stimulant.

Cinnamon water is most agreeable and fragrant when the picked bark is used in its distillation; the quantity of the essential oil equivalent to a pound of common bark, appears to us to be about two fluid drachms. Cassia buds distilled with water afford a product not unlike cinnamon water in flavour and sweetness, and they are not unfrequently substituted for the more expensive bark.

Foreign physicians are very much in the habit of ordering aqueous solutions of bitter extracts, instead of the infusions and decoctions which we usually employ, and they generally select cinnamon water as the most palatable and effective vehicle. Extract of taraxacum and extract of Peruvian bark are very commonly prescribed in this way.

Aqua Fœniculi.

℞ Fœniculi Seminum contusorum libram;

Fennel Water.

Take of Fennel Seeds, bruised, a pound;

His affunde tantum Aquæ, ut, post destillationem, supersit quod satis sit ad prohibendum empyreuma. Destillet congius.

Pour so much Water upon them, that, after distillation, a sufficiency may remain to prevent empyreuma. Distil one gallon.

Fennel water has a vapid sweetish taste, but it very soon loses all flavour, in consequence of the deposition of its essential oil, which, in cold weather, separates in small crystals. It is a very useless preparation, and scarcely ever met with in prescriptions.

Aqua Menthæ Piperitæ. — *Peppermint Water.*

℞ Menthæ piperitæ exsiccatæ* libram cum semisse, *vel*
Olei Menthæ piperitæ *pondere* drachmas tres ;

Take of Peppermint dried *, a pound and a half, *or*
Oil of Peppermint, *by weight*, three drachms ;

Herbæ vel Oleo affunde tantum Aquæ, ut, post destillationem, supersit quod satis sit ad prohibendum empyreuma. Destillet congius.

Pour upon the Herb or on the Oil so much Water, that, after distillation, a sufficient quantity may remain to prevent empyreuma. Let one gallon be distilled.

Peppermint furnishes one of the most useful of the distilled waters ; it is warm and yet not heating, and agreeable to the stomach, if not to the palate. It is properly selected as the concomitant of several purgative medicines, more especially of those containing senna, rhubarb, and other nauseating remedies of that class. A glass of warm peppermint water is an effectual carminative, and adapted to relieve spasmodic pains of the stomach.

Aqua Menthæ Viridis. — *Spearmint Water.*

℞ Menthæ viridis exsiccatæ * libram cum semisse, *vel*

Take of Spearmint dried *, a pound and a half, *or*

* Ubi herba recens adhibetur, pondere duplo utendum est.

* Where the fresh herb is employed, twice the above weight is to be used.

Olei Menthæ viridis *pondere* drachmas tres;

Herbæ vel Oleo affunde tantum Aquæ, ut, post destillationem, supersit quod satis sit ad prohibendum empyreuma. Destillet congius.

Oil of Spearmint, *by weight*, three drachms;

Pour upon the Herb or on the Oil so much Water, that, after distillation, a sufficient quantity may remain to prevent empyreuma. Let one gallon be distilled.

Spearmint water is used in the same way and for the same purposes as peppermint water, though its flavour is to most persons less agreeable. It is a good vehicle for saline and other aperients, and a useful addition to antispasmodic mixtures, as in the opening mixtures at pages 116 and 160, and in the strong camphor mixture prescribed at page 47.

Aqua Pimentæ. — *Pimenta Water.*

℞ Pimentæ Baccarum contusarum libram dimidiam,
Aquæ octarium;

Macera Baccas in Aqua per horas viginti quatuor; tum adjice tantum Aquæ, ut, post destillationem, supersit quod satis sit ad prohibendum empyreuma. Destillet congius.

Take of Pimenta Berries bruised, half a pound,
Water, a pint;

Macerate the Berries in Water for twenty-four hours; then add to them a sufficiency of Water to prevent empyreuma, and distil one gallon.

Pimenta water is a convenient aromatic vehicle for saline aperients, and useful as a solvent of bitter extracts. When recently distilled it has a brownish hue, and after having been for some time kept it deposits a brown sediment of a resinous nature, probably derived from altered essential oil: in other respects, this water retains its flavour for a long time, and has not the smallest tendency to become vapid and sour.

Aqua Pulegii.

℞ Pulegii exsiccati* libram cum semisse, *vel*
Olei Pulegii *pondere* drachmas tres;

Herbæ vel Oleo affunde tantum Aquæ, ut, post destillationem, supersit quod satis sit ad prohibendum empyreuma. Destillet congius.

Pennyroyal Water.

Take of Pennyroyal dried*, a pound and a half, *or*
Oil of Pennyroyal, *by weight*, three drachms;

Pour upon the Herb or upon the Oil so much Water, that, after distillation, enough may remain to prevent empyreuma. Distil one gallon.

The distilled water of pennyroyal was once in high estimation on account of its antinervous and antihysterical powers: it is pungent and stimulating, and though not perhaps in itself possessed of much activity, it is a very proper adjunct to, or vehicle for, the usual emmenagogues and other remedies which the hysterical and nervous complaints of females frequently require. In this way it is a proper substitute for the rose water in the *mistura ferri composita*, and may, upon the same principle, be conjoined with valerian, ammonia, and assafœtida, as in the prescriptions elsewhere given.

Aqua Rosæ.

℞ Rosæ centifoliæ petalorum libras octo;

His affunde tantum Aquæ, ut, post destillationem, supersit quod satis sit ad prohibendum empyreuma. Destillet congius.

Rose Water.

Take of Damask Rose Petals, eight pounds;

Pour upon them so much Water, that, after distillation, a sufficient quantity may remain to prevent empyreuma. Let one gallon distil over.

This water is commonly distilled, as above directed, from fresh rose leaves; the flowers should be gathered when in full

* Ubi herba recens adhibetur, pondere duplo utendum est.

* Where the fresh herb is employed, twice the above weight must be used.

perfection, in dry weather, and the petals carefully separated from the stalks and calyces; the distillation should be performed slowly, and if a very fragrant water is required, the first product should be returned into the still, and half its bulk drawn over, which is a better way of proceeding than that of adding to it another portion of the leaves.

Sometimes rose leaves are preserved for distillation by being salted; they retain their odour, and the water may then be drawn from them at any convenient period of the season, and equals in fragrancy that from the fresh petals. Rose water is, however, usually distilled at the time the flowers blow, and is preserved in jars or bottles which should be corked and kept in a cool place; with every precaution it sometimes will become sour, and is very apt to do so if the bottles or vessels in which it is kept in store are not originally perfectly clean. Spirit of wine ought not to be added to this water; it does not materially tend to its preservation, and confers upon it a stimulating power, which, as it is chiefly used in ophthalmic applications, ought to be avoided.

During the distillation of roses there passes over a considerable portion of fatty matter, smelling strongly of the flower, but not so pleasant, and soon becoming rancid. Genuine otto of roses is not, it is said, prepared by distillation, but by putting a quantity of carefully picked rose leaves into a clean jar or cask, with a quantity of water just sufficient to cover them; the vessel is then set in the sun for a few days, and in about a week the otto collects in the form of a scum upon the surface, and is removed by a piece of cotton.

INFUSIONS.

The *infusions* of the present London Pharmacopœia are, without exception, aqueous solutions of the active parts of certain vegetable products, and they are all directed to be made with boiling water. They are generally made in earthenware jugs with covers, but the kind of vessel should have been specified, inasmuch as a clean metallic vessel retains the heat much longer than one of earthen or of stone

ware, and will consequently, in many instances, yield, upon this principle, a stronger infusion.

The substances abounding in readily-soluble extractive matter, and of which the properties or flavour are at the same time injured by boiling, are those best adapted to this mode of preparation; but, generally speaking, remedies of a very active nature ought not thus to be administered, as the strength of infusions is liable to vary.

Soft water, and, in some cases, distilled water, should be used in preparing infusions, and it should be poured boiling-hot upon the ingredients, which should be finely bruised or cut into thin slices, as the following formulæ direct: if in powder, which may sometimes perhaps be expedient, the infusions will require filtration through paper, but generally they may be strained through tow or through a piece of fine linen; they are always to be used cold.

The greater number of the infusions directed in the Pharmacopœia are liable to speedy decomposition in warm weather; a circumstance which should not be forgotten by the prescriber: they should, at all events, be prepared fresh for use. Infusion of calumba, and the compound infusions of gentian and of senna, are very liable to this objection; but in prescriptions, spirituous and saline substances are often dissolved in them, and contribute considerably to their preservation. They are, with few exceptions, improper vehicles for the metallic salts, some of which they decompose, modifying their activity, and in some instances rendering them nearly inert in their usual doses: but, because in these and some other cases precipitations and decompositions may ensue, we are not therefore always to conclude that the substances are improperly prescribed in conjunction. Such mixtures may be unchemical or incompatible, but they are by no means always inactive.

Infusum Anthemidis. *Infusion of Chamomile.*

℞ Anthemidis Florum drachmas duas,	Take of Chamomile Flowers, two drachms,

Aquæ ferventis octarium dimidium;	Boiling Water, half a pint;
Macera per sextam horæ partem, in vase leviter clauso, et cola.	Macerate for ten minutes in a lightly covered vessel, and strain.

This infusion has the bitterness and much of the aroma of the flowers; and though rarely occurring in prescriptions, is a domestic remedy in general use, the stomachic virtues of a cup of cold chamomile tea taken in the morning, fasting, being well known to those who suffer from morning nausea and a foul taste in the mouth: but it is a mere palliative in such cases, unless strenuously seconded by careful attention to diet. Warm chamomile tea is every where known as the judicious aide-de-camp of an ipecacuanha vomit, and it deserves the character it has acquired.

Infusum Armoraciæ Compositum.

℞ Armoraciæ Radicis recentis concisæ,
Sinapis Seminum contusorum, singulorum unciam,
Spiritûs Armoraciæ compositi fluidunciam,
Aquæ ferventis octarium;

Macera Radicem in Aqua per horas duas, in vase leviter clauso, et cola; tum adjice Spiritum Armoraciæ compositum.

Compound Infusion of Horse-Radish.

Take of fresh Horse-Radish Root sliced,
Mustard Seeds bruised, of each an ounce,
Compound Spirit of Horse-Radish, a fluid ounce,
Boiling Water, a pint;

Macerate the Root (and Seed) in the Water for two hours, in a covered vessel, and strain; then add the compound Spirit of Horse-Radish.

This infusion is chiefly intended as a stimulant in paralytic affections, but it is not a commendable formula, either alone or as a vehicle for other analogous irritants. When kept, it soon becomes turbid from the deposition of vegetable albumen, and in warm weather, or in a warm room, speedily runs into putrefactive fermentation. These objections have excluded it from practice, and it should have been omitted among the

formulæ of the Pharmacopœia. Horse-radish, as a stimulant, is best used as it frequently comes to table, namely, finely grated; and mustard, in its usual form (see page 162), is also a good medicine; but these, and all other vegetables abounding in the albuminous or vegeto-animal principle, are apt, in their raw state, to disorder weak stomachs, and excite flatulency and fetid eructations. Mustard itself is open to this objection.

Infusum Aurantii Compositum.

℞ Aurantii Corticis exsiccati drachmas duas,
Limonum Corticis recentis drachmam,
Caryophyllorum contusorum drachmam dimidiam,
Aquæ ferventis octarium dimidium;

Macera per quartam horæ partem, in vase leviter clauso, et cola.

Compound Infusion of Orange-Peel.

Take of Orange Peel dried, two drachms,
Lemon-Peel fresh, a drachm,
Cloves bruised, half a drachm,
Boiling Water, half a pint;

Macerate for a quarter of an hour in a lightly covered vessel, and strain.

This is an elegant and agreeable vehicle for small doses of sulphate of magnesia, and for several of the bitter tinctures, and ammonia, being grateful both to the palate and stomach, and tending to restore the tone of the latter where it has been debilitated.

Infusum Calumbæ.

℞ Calumbæ concisæ drachmas duas,
Aquæ ferventis octarium dimidium;

Macera per horas duas, in vase leviter clauso, et cola.

Infusion of Calumba.

Take of Calumba sliced, two drachms,
Boiling Water, half a pint;

Macerate for two hours in a covered vessel, and strain.

We have already spoken of calumba as a valuable bitter—(see *Calumbæ Radix* in the Materia Medica), and the infusion made as above is a good form for exhibiting it. It is prescribed with advantage for infants debilitated by diarrhœa, as in the formula given above (see page 45), or in the following:—

℞ Infus. Calumbæ,
Aquæ Anethi, āā f℥vj.
Spiritûs Ammoniæ compos. ℿxx.
Fiat mistura de quâ detur cochleare unum minimum tertiâ quâque horâ.

Mr. Thomson recommends infusion of calumba for restraining the nausea and vomiting which attend pregnancy. As it is not discoloured by preparations of iron, it is very properly prescribed as a vehicle where it is desirable to administer them in conjunction with bitters.

℞ Infusi Calumbæ f℥xj.
Tincturæ Ferri Muriatis ℿxv.
Tincturæ Calumbæ f℥j.
Fiat haustus bis die sumendus.

In lithic diathesis Dr. Paris prescribes the following draught *:—

℞ Magnesiæ Subcarb. ℈j.
Infus. Calumbæ f℥j.
Tinct. Calumbæ f℥j.
Fiat haustus.

Whenever this infusion is prescribed, it should be freshly prepared and kept cool, for in warm weather or warm rooms it becomes ropy and decomposed in the course of twenty-four hours.

Infusum Caryophyllorum. *Infusion of Cloves.*

℞ Caryophyllorum contusorum drachmam, | Take of Cloves bruised, a drachm,

* Pharmacologia, vol. i. p. 401.

Aquæ ferventis octarium dimidium;	Boiling Water, half a pint;
Macera per horas duas in vase leviter clauso, et cola.	Macerate for two hours in a covered vessel, and strain.

Three or four table-spoonsful of this infusion taken twice a day, in that form of dyspepsia which is attended by a sense of coldness, and what is usually described as *gnawing* at the stomach, is often more effectual in its relief than bitters or acids. In these cases its efficacy will generally be improved by a little ammonia, as in the following draught, which may be taken at noon and in the evening, it being presumed that in all these cases proper and careful attention is paid to diet, that abstinence is observed in regard to those varieties of food which are known to disagree, and that recourse is not had to spirituous liquors to quell the sinking coldness that is felt about the region of the stomach, and which, though they afford temporary relief, are infallibly productive of subsequent evil consequences.

℞ Ammoniæ Subcarbonatis gr. vj.
Infusi Caryophill. f℥iss.
Fiat haustus meridie et vesperi sumendus.

In such cases, if the bowels are torpid, a drachm or two drachms of sulphate of magnesia should be taken every morning in some warm stomachic vehicle.

Infusum Cascarillæ. *Infusion of Cascarilla.*

℞ Cascarillæ Corticis contusi unciam dimidiam,	Take of Cascarilla Bark bruised, half an ounce,
Aquæ ferventis octarium dimidium;	Boiling Water, half a pint;
Macera per horas duas in vase leviter clauso, et cola.	Macerate for two hours in a covered vessel, and strain.

This is an excellent light and aromatic bitter, well suited to

weak stomachs, and a proper vehicle for acids and alkalies, as occasionally prescribed in dyspeptic cases. Where the bowels have been disordered by diarrhœa, the remaining local debility is relieved by the following mixture:—

℞ Infusi Cascarillæ f ℥v.
Tincturæ Cinnamomi,
Syrupi Aurantiorum, āā f ℥ss.
Misce. Sumat tertiam partem ter die.

Infusum Catechu Compositum.

℞ Catechu Extracti drachmas duas cum semisse,
Cinnamomi Corticis contusi drachmam dimidiam,
Aquæ ferventis octarium dimidium;
Macera per horam in vase leviter clauso, et cola.

Compound Infusion of Catechu.

Take of Extract of Catechu, two drachms and a half,
Cinnamon Bark bruised, half a drachm,
Boiling Water, half a pint;
Macerate for an hour in a covered vessel, and strain.

This is a good form for the exhibition of catechu, but is not often resorted to, in consequence of the comparative facility by which the same purposes are fulfilled by the use of the tincture (see page 55). It is prescribed in obstinate diarrhœa after the evacuation of the bowels by rhubarb and other proper aperients, and is occasionally conjoined with cretaceous and opiate remedies. It may be taken in the dose of two ounces every four or six hours, or after every purging motion.

Infusum Cinchonæ.

℞ Cinchonæ lancifoliæ Corticis contusi unciam dimidiam,

Infusion of Cinchona.

Take of lance-leaved Cinchona Bark, half an ounce,

Aquæ ferventis octarium dimidium;	Boiling Water, half a pint;
Macera per horas duas in vase leviter clauso, et cola.	Macerate for two hours in a covered vessel, and strain.

In the administration of cinchona it is often necessary, on account of the delicate state of the stomach and bowels of invalids, to employ some such mild and diluted state of it as the above; such an infusion further diluted, if necessary, will also often agree with children when the other forms of Peruvian bark are inadmissible. But in all these cases it is now usual to substitute cinchonia and quinia, and especially the sulphate of quinia: these, in small doses, appear to fulfil the various indications required of cinchona; but more extended experience is perhaps requisite before we can speak with certainty upon the subject.

Infusum Cuspariæ. — *Infusion of Cusparia.*

℞ Cuspariæ Corticis contusi drachmas duas,	Take of Cusparia Bark bruised, two drachms,
Aquæ ferventis octarium dimidium;	Boiling Water, half a pint;
Macera per horas duas in vase leviter clauso, et cola.	Macerate for two hours in a covered vessel, and strain.

This simple infusion of Angustura bark may be used in any of the cases which have been noticed above (see page 75), as proper for its exhibition, especially in dysenteric and bilious diarrhœa, where proper evacuants have preceded it. Tincture of orange-peel, or of cinnamon, or compound spirit of lavender, are good adjuncts. The dose, like that of most of the other infusions, is, for adults, from one to two ounces three or four times a day. If given to children it generally requires dilution; for this purpose a third or fourth part of dill water, or of caraway water, is in most instances proper.

Infusum Digitalis.

℞ Digitalis Foliorum exsiccatorum drachmam,
Spiritûs Cinnamomi fluidunciam dimidiam,
Aquæ ferventis octarium dimidium;

Macera per horas quatuor in vase leviter clauso, et cola; tum adjice Spiritum.

Infusion of Foxglove.

Take of Foxglove Leaves, dried, a drachm,
Spirit of Cinnamon, half a fluid ounce,
Boiling Water, half a pint;

Macerate for four hours in a covered vessel, and strain; then add the Spirit.

This is not, upon the whole, a commendable form for the administration of so powerful a remedy; the powder, or the tincture are to be preferred, as we have elsewhere remarked (see page 80). Of the above infusion, about two drachms twice a day may be considered as a proper dose, gradually increased, with the precautions already adverted to, till it produces the desired effect.

Infusum Gentianæ Compositum.

℞ Gentianæ Radicis concisæ,
Aurantii Corticis exsiccati, singulorum drachmam,
Limonum Corticis recentis drachmas duas,
Aquæ ferventis fluiduncias duodecim;

Macera per horam in vase leviter clauso, et cola.

Compound Infusion of Gentian.

Take of Gentian Root sliced,
Orange Peel dried, of each a drachm,
Lemon Peel fresh, two drachms,
Boiling Water, twelve fluid ounces;

Macerate for an hour in a covered vessel, and strain.

Compound infusion of gentian is an agreeable stomachic vehicle for a number of other remedies, especially for acids and alkalies; in warm weather and warm rooms it very soon decomposes, so that it should always be used freshly prepared, and not prescribed except for immediate use. In other

respects it is a pleasant and efficacious bitter, of which an ounce and a half may be taken twice or thrice a day.

Infusum Lini Compositum.

℞ Lini usitatissimi Seminum contusorum unciam,
Glycyrrhizæ Radicis concisæ unciam dimidiam,
Aquæ ferventis octarios duos;

Macera per horas quatuor, prope ignem, vase leviter clauso, et cola.

Compound Infusion of Linseed.

Take of Linseed bruised, an ounce,
Liquorice Root sliced, half an ounce,
Boiling Water, two pints;

Macerate for four hours near the fire in a covered vessel, and strain.

This is a simple demulcent or mucilaginous infusion, useful as a common drink in cases of cough and catarrh; but it is not very agreeable, nor does it deserve a place among the formulæ of a Pharmacopœia.

Infusum Quassiæ.

℞ Quassiæ Ligni concisi scrupulum,
Aquæ ferventis octarium dimidium;

Macera per horas duas in vase leviter clauso, et cola.

Infusion of Quassia.

Take of Quassia Wood sliced, a scruple,
Boiling Water, half a pint;

Macerate for two hours in a covered vessel, and strain.

Infusion of quassia may be considered as an aqueous solution of the bitter principle, nearly pure, containing neither mucilage, tan, nor common extractive, with which it is usually associated in the other tonics: though the product of the above formulæ is exceedingly bitter, it of course holds a very small relative proportion of the active matter of the wood in solution, two scruples or a drachm of which would perhaps have been, in most cases, a preferable quantity. Under the head "Quassiæ Lignum" in the Materia Medica, some of the advantages of this infusion are mentioned; it is chiefly

useful as a vehicle for mineral tonics, and especially for sulphate of zinc and the salts of iron. In these cases a stronger infusion of quassia diluted with some aromatic water, or the common infusion with a stomachic tincture, may be prescribed. It has been deemed particularly effectual in the dyspeptic affections of gouty and of hysterical patients.

Infusum Rhei.

℞ Rhei Radicis concisæ drachmam,
Aquæ ferventis octarium dimidium;
Macera per horas duas in vase leviter clauso, et cola.

Infusion of Rhubarb.

Take of Rhubarb Root sliced, a drachm,
Boiling Water, half a pint;
Macerate for two hours in a covered vessel, and strain.

Aqueous infusion is not a bad form for the administration of rhubarb, where it is wished to act very gently upon the bowels; but the powdered root presents so convenient and eligible a form of the remedy, that the above is almost superfluous. A compound infusion of rhubarb with gentian and cloves would perhaps have been more useful.

Infusum Rosæ Compositum.

℞ Rosæ Gallicæ Petalorum exsiccatorum unciam dimidiam,
Acidi sulphurici diluti fluidrachmas tres,
Sacchari purificati unciam cum semisse,
Aquæ ferventis octarios duos cum semisse;
Aquam Rosæ Petalis superinfunde in vase vitreo; dein Acidum immisce, et macera per horam dimidiam. Denique liquorem cola, eique Saccharum adjice.

Compound Infusion of Roses.

Take of Red Rose Petals dried, half an ounce,
Diluted Sulphuric Acid, three fluid drachms,
Refined Sugar, an ounce and a half,
Boiling Water, two pints and a half;
Pour the Water upon the Rose Petals in a glass vessel; then mix in the Acid, and macerate for half an hour. Lastly, strain the liquor, and add to it the Sugar.

This compound infusion is a pleasant acid drink in febrile disorders, and is recommended by its flavour and colour as an elegant vehicle for a variety of remedies, in which capacity it has already been frequently mentioned (see pages 63, 90, 115, 200, and 317). It covers very effectually the nauseous saline bitterness of sulphate of magnesia; it is an unobjectionable solvent for sulphate of quinia, and the different bitter tinctures and infusions are not incompatible with it. It is also useful in the composition of gargles, containing the acids, nitre, alum, or tincture of capsicum. The alkalies and alkaline earths, when the acid is saturated by them, change its red colour to green; alum renders it purple.

Infusum Sennæ Compositum.	*Compound Infusion of Senna.*
℞ Sennæ Foliorum unciam cum semisse,	Take of Senna Leaves, an ounce and a half,
Zingiberis Radicis concisæ drachmam,	Ginger Root sliced, a drachm,
Aquæ ferventis octarium;	Boiling Water, a pint;
Macera per horam in vase leviter clauso, et liquorem cola.	Macerate for an hour in a covered vessel, and strain the liquor.

A drachm of cloves would have been an addition to this infusion preferable to ginger, for when so made it may be longer kept without decomposition, and is, moreover, more agreeable to the palate. Compound infusion of senna is rarely prescribed alone, for reasons already given (page 160), but it is a good auxiliary vehicle for sulphate of magnesia, or tartrate of potassa, as in the formulæ prescribed at pages 160, 114, and 97. It should always be freshly prepared, for after it has been kept a day or two it deposits a yellowish precipitate, said to be of a very griping nature, and acquires a very nauseous odour. When sulphate of magnesia is dissolved in it, these changes are more slow in taking place; and in cool weather the common black dose may be kept for some weeks.

Infusum Simaroubæ.

℞ Simaroubæ Corticis contusi drachmam dimidiam,
Aquæ ferventis octarium dimidium;

Macera per horas duas in vase leviter clauso, et cola.

Infusion of Simarouba.

Take of Simarouba Bark, bruised, half a drachm,
Boiling Water, half a pint;

Macerate for two hours in a covered vessel, and strain.

Simarouba appears to possess no advantages over other astringent bitters; it has been used in diarrhœa, in dysentery, and in the treatment of intermittent fevers; and the infusion is as good a form as any for its exhibition, but it should be double the strength of that prescribed in the above formula. Dr. Hooper* gives the following prescription for the use of simarouba in that part of the treatment of diarrhœa requiring tonics and astringents:—

℞ Radicis Simaroubæ contusæ ℥ss.
Corticis Granati contusi ℥ij.
——— Aurantii excisæ ℥iij.
Aquæ ferventis oct. j.
Macera per horam, dein cola.

℞ Hujus infusi f℥vij.
Confectionis Aromaticæ ℥j.
Tincturæ Cardamomi compos. f℥ss.
Tincturæ Opii f℥ss.
Fiat mistura cujus sumantur cochlearia tria magna ter quaterve die.

Infusum Tabaci.

℞ Tabaci Foliorum drachmam,
Aquæ ferventis octarium;

Macera per horam in vase leviter clauso, et cola.

Infusion of Tobacco.

Take of Tobacco Leaves, a drachm,
Boiling Water, a pint;

Macerate for an hour in a covered vessel, and strain.

* Physician's Vade-Mecum.

Under the head "Tabaci Folia," in the Materia Medica, the general character of the drug, and its principal applications, are stated. A drachm of the leaves to a pint of boiling water is the usual strength of the infusion, when it is intended to be used as an enema, and it is now scarcely ever otherwise employed.

Tobacco glysters are sometimes used for the destruction of intestinal worms, especially of ascarides and trichurides, but the treatment is not commendable, and very dangerous in children's cases. For this purpose half a drachm of tobacco to twelve ounces of water is sufficient strength. It was once the fashion to employ enemas of infusion and of the smoke of tobacco in cases of suspended animation, a plan invariably dangerous, and founded upon the most erroneous physiological principles.

As a diuretic, the infusion and a tincture of tobacco have sometimes been prescribed, but the remedy is too dangerous, and too uncertain in its effects upon the stomach and upon the system generally, to be resorted to by any cautious practitioner; more especially as it is not calculated to answer any purposes which cannot be attained by less objectionable means.

MUCILAGES.

This term is used in the Pharmacopœia rather in a mechanical than a chemical sense, and is intended to imply a viscid and inert aqueous solution; otherwise two such dissimilar substances, chemically speaking, as gum arabic and starch, would not have been included under the same denomination.

Mucilage of gum arabic is useful in the manufacture of pills, and is often advantageously employed for the purpose of blending oils and other insoluble substances with water: mucilage of starch is chiefly, if not exclusively, employed as a vehicle for opium and other active remedies in the form of enema.

Mucilago Acaciæ. — *Mucilage of Gum Arabic.*

℞ Acaciæ Gummi contriti uncias quatuor, Aquæ ferventis octarium dimidium;	Take of Acacia Gum (Gum Arabic) in powder, four ounces, Boiling Water, half a pint;
Gummi cum Aquâ paulatim instillatâ tere, donec in Mucilaginem abeat.	Add the Water by degrees to the Gum, and rub them together till a mucilage is produced.

Gum arabic may be taken as a sample of gum in its purest form, and as such its leading chemical properties and pharmaceutical uses have been shortly adverted to above (page 3). In addition to its applications already noticed, we sometimes employ it to allay the tracheal irritation and tickling sensation in the throat, which often proves so troublesome a concomitant to catarrh: for this purpose, syrups and small quantities of acid are occasionally mixed with it.

Mucilago Amyli. — *Mucilage of Starch.*

℞ Amyli drachmas tres, Aquæ octarium;	Take of Starch, three drachms, Water, a pint;
Amylum cum Aquâ paulatim instillatâ tere; dein coque, donec in Mucilaginem abeat.	Add the Water gradually to the Starch, and rub them together; then boil until they produce a mucilage.

The chemical characters of starch are noticed under the head "Amylum," in the Materia Medica, and the commonest varieties of it, used as articles of food, are there enumerated. The above aqueous solution of starch may be used generally as a demulcent; but its liability to decomposition is against its employment, and its flavour is not of the most agreeable kind, so that arrow-root is its usual substitute.

The leading characters by which starch is chemically distinguished from gum are, its insolubility in cold water, and

the blue compound which it forms with iodine. Its ultimate elements, carbon, oxygen, and hydrogen, approach nearly, in the relative proportions in which they are combined, to those of gum and sugar, as is apparent from the following results of the experiments of Gay-Lussac upon this subject :—

Ultimate Elements of	Starch	Gum	Sugar
Carbon	43.55	42.23	42.47
Oxygen	49.68	50.84	50.63
Hydrogen	6.77	6.93	6.90
	100	100	100

It is not, therefore, surprising, that in many natural processes, and in certain artificial operations, these three proximate principles are mutually convertible into each other.

DECOCTIONS.

In consequence of the difficult solubility of some of the active principles of vegetables, it is occasionally necessary to substitute decoction for infusion, in order to separate them from their inert accompaniments ; but there are several objections to this process: the continued application of heat produces a chemical change in some of the substances usually present ; volatile matters, upon which much of the activity of these remedies often depends, are dissipated ; and substances dissolved by the decoction whilst hot, are frequently precipitated as it cools. Where the object is to separate difficultly soluble mucilaginous substances, and principles which are neither volatile nor changeable at the temperature of boiling water, the process is often effectual and unobjectionable.

In the preparation of decoctions, a principal object should be to continue the boiling no longer than is necessary for the extraction of the soluble parts of the vegetables, and they should be strained while hot, lest their active principles should be deposited, and lost in that operation. Common saucepans, which should be rather deep than shallow, are

generally used in preparing these decoctions: the directions occasionally given in regard to particular forms of these vessels appear to be quite superfluous; and it is scarcely necessary to add, that the vegetables should be cut into slices, or bruised into a coarse powder, in order to facilitate the action of the solvent upon them, without at the same time being so finely divided as to pass through the sieve or strainer.

In the greater number of decoctions there is held in solution a portion of extractive matter, and frequently of astringent matter, or tan; acids and other peculiar vegetable principles are also often present, and in many of them a large relative proportion of mucilage: hence it is that the greater number of metallic salts are said to be incompatible with them, that is, to occasion change of colour and precipitation when their solutions are added to, or when they are dissolved in them: but it by no means always follows, that because the metallic oxide enters into new combinations, it is therefore rendered inert; nor are we always to conclude that substances are medically incompatible because they are chemically so.

Of the following decoctions, those of quince seeds, woody nightshade, Iceland moss, mallow, poppies, elm, and white hellebore, are very insignificant in point of real utility: the decoctions of barley are usually prepared in the kitchen, and those of oak and senega might have been left to extemporaneous prescription.

Decoctum Alöes Compositum.

℞ Extracti Glycyrrhizæ semunciam,
Potassæ Subcarbonatis scrupulos duos,
Alöes spicatæ Extracti contriti,
Myrrhæ contritæ,
Croci Stigmatum, singulorum drachmam,

Compound Decoction of Aloes.

Take of Extract of Liquorice, half an ounce,
Subcarbonate of Potassa, two scruples,
Extract of Spiked Aloe in powder,
Myrrh in powder,
Saffron, of each a drachm,

Tincturæ Cardamomi compositæ fluiduncias quatuor, Aquæ octarium;	Compound Tincture of Cardamoms, four fluid ounces, Water, a pint;
Glycyrrhizam, Potassæ Subcarbonatem, Alöen, Myrrham, et Croci Stigmata, decoque cum Aquâ ad fluiduncias duodecim, et cola; tum adjice Tincturam Cardamomi compositam.	Boil down the Liquorice, the Subcarbonate of Potassa, the Aloes, Myrrh, and Saffron, with the Water, to twelve fluid ounces, and strain; then add the compound Tincture of Cardamoms.

This decoction corresponds with the celebrated *Baume de Vie*, and is a very good form for the exhibition of aloes, which is retained in solution by the alkaline carbonate, whilst its nauseous bitterness is considerably concealed by the flavour of the liquorice, the extract of which should be that prepared according to the Pharmacopœia, and not the common Spanish liquorice, as it is called, which is usually substituted for it. The myrrh is generally a proper adjunct to aloes, but the saffron is an ineffective ingredient, except in as far as flavour is concerned; the tincture of cardamoms assists in preventing spontaneous decomposition of the decoction, and makes it agreeable to the stomach.

This is a mild and commendable remedy where a warm and stomachic aperient is required, which is often the case in hysterical and hypochondriacal affections, and in certain spasmodic disorders, where the bowels have become torpid from the use of opiates. Its purgative quality may be increased by the addition of tincture or infusion of senna; and the mixture is far from being so disgusting to the palate as the nature of its components would lead us to expect. The dose is from half an ounce to an ounce and a half. It is often of singular service in dyspepsia, where it corrects acidity, and promotes the action of the stomach and bowels: in such cases half an ounce or six drachms may be taken every other morning early, mixed with an equal quantity of some aromatic water or bitter and stomachic infusion.

Decoctum Cinchonæ. — *Decoction of Cinchona.*

℞ Cinchonæ lancifoliæ Corticis contusi unciam,	Take of lance-leaved Cinchona Bark bruised, an ounce,

Aquæ octarium ;	Water, a pint ;
Coque per sextam horæ partem in vase leviter clauso, et liquorem adhuc calentem cola.	Boil for ten minutes in a covered vessel, and strain the liquor while hot.

This is the most common liquid form in which cinchona is administered ; and though the whole active matter of the above quantity of bark is by no means abstracted by the brief decoction directed in the formula, it is found to contain a considerable portion of cinchonia and of astringent and extractive matter: the latter has a tendency during the boiling to become less and less soluble; in consequence we observe films separate upon the surface of the decoction, and as it cools it becomes paler-coloured and turbid, owing to the deposition of altered extractive and resinous matter. From the bark remaining after the above decoction, a portion of cinchonia may be separated by the usual process of boiling it with very dilute sulphuric acid.

Hot decoction of bark is brown, and nearly transparent, but it becomes pale and turbid when cold, and gradually lets fall the deposit just noticed.

This decoction may be given alone in doses of an ounce and a half or two ounces thrice or four times a day, or it may be more properly used as a vehicle for other preparations of cinchona, or conjoined with other tonics.

The medical uses of bark, as far as they require enumeration in a work on Pharmacy, have been described under the head "Cinchona," in the Materia Medica, so that it only remains here to add a few of the usual formulæ in which the decoction is chiefly concerned.

In that part of the treatment of nervous fever requiring the exhibition of the antiseptic tonics, bark, combined, where the bowels will bear it, with acids, is most properly resorted to; and the decoction of the above formula, or one somewhat stronger is generally used.

℞ Decocti Cinchonæ f ℥xj.
Tincturæ Cinchonæ f ℥j.
Acidi Sulphurici diluti ♏x.
Fiat haustus.

From three to five minims of muriatic acid, or from six to ten minims of dilute nitric acid, may occasionally be substituted for the sulphuric acid in this prescription, and a drachm of syrup of orange-peel or of ginger may also be added.

In the cure of intermittents, cinchona requires to be given in such large quantities that the decoction is an inadequate preparation, except as a vehicle for the extract or powder, as in the following draughts:—

℞ Decocti Cinchonæ f3xiij.
Tincturæ Cinchonæ compos. f3ij.
Pulveris Cinchonæ ℈j.
Syrup. Aurant. f3j.
M. fiat haustus secundâ vel tertiâ quâque horâ sumendus, absente febre.

℞ Extracti Cinchonæ gr. x.
Decocti Cinchonæ f3xv.
Tinct. Aurantii f3j.
Fiat haustus ut suprà sumendus.

In the treatment of putrid sore throat, and other malignant diseases, it is often necessary to resort to cinchona in conjunction with aromatics:

℞ Confectionis Aromaticæ ℥ss.
Decocti Cinchonæ f3xiij.
Spiritûs Etheris compos. f3ss.
Fiat haustus tertiâ vel quartâ quâque horâ sumendus.

℞ Pulveris Cinnamomi compos. gr. x.
Tincturæ Cinchonæ compos. f3ij.
Decoct. Cinchonæ f3xij.
Fiat haustus.

Decoctum Cydoniæ. — *Decoction of Quince Seeds.*

℞ Cydoniæ Seminum drachmas duas,
Aquæ octarium;

Take of Quince Seeds, two drachms,
Water, a pint;

Coque lento igne per sextam horæ partem; dein cola.	Boil over a slow fire for ten minutes; then strain.

This decoction should rather have been placed among the "Mucilages." Quince seeds abound in a readily soluble mucilaginous substance, which is extracted by the above process, and forms a viscid solution. There are very few, if any, cases in which this decoction is really useful, and its extreme proneness to decomposition is an objection to its employment. As a soothing application to the excoriated surface produced by tears trickling from the corner of the eye in cases of obstructed lachrymal duct, it sometimes answers better than any analogous remedy.

Decoctum Dulcamaræ. — *Decoction of Woody Nightshade.*

℞ Dulcamaræ Caulis concisi unciam, Aquæ octarium cum semisse;	Take of the Stalks of Woody Nightshade sliced, an ounce, Water, a pint and a half;
Decoque ad octarium, et cola.	Boil down to a pint, and strain.

Under the article "Dulcamaræ Caulis," in the Materia Medica, we have given our opinion of the value of that remedy, and consequently also of its decoction, which might safely have been confided to the extemporaneous prescription of those who trust in its medical efficacy.

Decoctum Hordei. — *Decoction of Barley.*

℞ Hordei Seminum uncias duas, Aquæ octarios quatuor cum semisse;	Take of Pearl Barley, two ounces, Water, four pints and a half;
Res alienas Hordei Seminibus ad-	First wash away with cold Water

hærentes Aquâ frigidâ primùm ablue; deindè, affuso Aquæ octario dimidio, Semina paulisper coque. Hâc Aquâ abjectâ, superinfunde quod reliquum est, priùs fervefactum; tum decoque ad octarios duos, et cola.

all foreign matter adhering to the Barley; then pour upon it half a pint of the Water, and boil a little while. Having thrown away this Water, pour the rest, previously made boiling-hot, upon the Barley; then boil down to two pints, and strain.

The composition of this decoction has been stated above (p. 93). Under the humbler name of *barley-water* it is in constant request in the room of the sick, and at the table of the invalid. Mixed with one-third or an equal part of fresh milk, it is often successfully used as food for infants; but in such application of it the greatest attention should be paid to its cleanliness and freshness: it soon becomes slightly acescent, and in that state has brought on a very pernicious diarrhœa. It is a good vehicle for various demulcent remedies; and either the above simple decoction, or the following complex one, are among the best media for the exhibition of solution of potassa, in cases of the uric diathesis.

Decoctum Hordei Compositum.

℞ Decocti Hordei octarios duos,
Caricæ Fructûs concisi uncias duas,
Glycyrrhizæ Radicis concisi et contusæ unciam dimidiam,
Uvarum passarum, demptis acinis, uncias duas,
Aquæ octarium;
Decoque ad octarios duos, et cola.

Compound Decoction of Barley.

Take of Decoction of Barley, two pints,
Figs sliced, two ounces,
Liquorice Root sliced and bruised, half an ounce,
Raisins, stoned, two ounces,
Water, a pint;
Boil down to two pints, and strain.

This is a good demulcent drink in all cases where the former is requisite, for which it may be occasionally substituted: it is

also a proper vehicle for acids, nitre, and similar applications in the form of gargle.

Both the above decoctions of barley are rather subjects of culinary than of pharmaceutical art, and as such they have been properly introduced into the "Cook's Oracle" by the agreeable Author of that work, with the following annotation:—

"These drinks are intended to assuage thirst in ardent fevers and inflammatory disorders, for which plenty of mild diluting liquor is one of the principal remedies; and if not suggested by the medical attendant, is frequently demanded by honest instinct, in terms too plain to be misunderstood. The stomach sympathises with every fibre of the human frame, and no part of it can be distressed without in some degree offending the stomach: therefore it is of the utmost importance to soothe this grand organ, by rendering every thing we offer to it as elegant and agreeable as the nature of the case will admit of. The barley drink, prepared according to the second receipt, will be received with pleasure by the most delicate palate."

These observations deserve the notice of medical men, who are not always so attentive to the elegance of their formulæ as they might be, in perfect consistence with their efficacy: but I have quoted Dr. KITCHINER chiefly with the view of applauding his attention to the diet of the invalid, and his very laudable attempt at introducing weight and measure into the "Analeptic Part of the Art of Physic," commonly called *Cookery*.

Decoctum Lichenis.	*Decoction of Iceland Moss.*
℞ Lichenis unciam, Aquæ octarium cum semisse; Decoque ad octarium, et cola.	Take of Iceland Moss, an ounce, Water, a pint and a half; Boil down to a pint, and strain.

In this mode of preparing the decoction of Iceland moss,

its bitter principle is retained, and a disagreeable mucilaginous solution is the result. There appears to be nothing in the bitter principle of this moss to recommend it in preference to other bitters; and the mucilaginous or amylaceous part is not more nutritive than the other modifications of gum or starch. As a remedy in debility, phthisis, and in disorders requiring nutritive tonics, abundant substitutes may be found for this lichen: it may, therefore, be rejected from our Materia Medica without the smallest inconvenience, though as a domestic remedy, in Iceland, it may possibly be entitled to some consideration.

Decoctum Malvæ Compositum.

℞ Malvæ exsiccatæ unciam,
Anthemidis Florum exsiccatorum unciam dimidiam,
Aquæ octarium;

Coque per quartam horæ partem, et cola.

Compound Decoction of Mallow.

Take of Mallow dried, an ounce,
Chamomile Flowers dried, half an ounce,
Water, a pint;

Boil for a quarter of an hour, and strain.

The utility of this decoction is not apparent: the mallow is inert. Of the virtues of chamomile we have spoken above. If intended for fomentations, it has no advantage over warm water; if as a vehicle for active substances in the form of enema, the same observation applies; or at all events the chamomile is its only useful ingredient.

Decoctum Papaveris.

℞ Papaveris Capsularum concisarum uncias quatuor,
Aquæ octarios quatuor;

Coque per quartam horæ partem, et cola.

Decoction of Poppy.

Take of Poppy Capsules cut, four ounces,
Water, four pints;

Boil for a quarter of an hour, and strain.

Decoction of poppy heads is intended as an anodyne fomentation, but there are very few cases in which it is preferable to warm water with a little tincture of opium added to it. The seeds of the poppy should be rejected, as they render the decoction unnecessarily greasy.

Decoctum Quercus. — *Decoction of Oak.*

℞ Quercûs Corticis unciam, Aquæ octarios duos; Decoque ad octarium, et cola.	Take of Oak Bark, an ounce, Water, two pints; Boil down to a pint, and strain.

This decoction is used internally and externally: it is tonic and astringent, but is by no means to be considered a fit substitute for cinchona, in the treatment of febrile diseases. As an astringent in diarrhœa, after the bowels have been duly cleared by proper aperients, it may be prescribed as follows :—

℞ Confectionis Opii ℥j.
Decocti Quercûs f℥vss.
Tinct. Camphoræ compos. f℥ss.
M. fiat mistura de qua sumantur cochlearia tria magna post singulas liquidas sedes, vel ter in die.

As an astringent gargle, decoction of oak bark is sometimes used alone, or as a vehicle for proper adjuncts; and it is occasionally prescribed as a lotion in protrusions of the rectum and piles, and as an injection in gleety discharges. In the latter case it is convenient, in most instances, to render it a little viscid, by the addition of mucilage of gum arabic.

Decoctum Sarsaparillæ. — *Decoction of Sarsaparilla.*

℞ Sarsaparillæ Radicis concisæ uncias quatuor, Aquæ ferventis octarios quatuor;	Take of Sarsaparilla Root, sliced, four ounces, Boiling Water, four pints;

Macera per horas quatuor, in vase leviter clauso, prope ignem; dein Sarsaparillæ Radicem exime et contunde. Contusam liquori redde, et iterum simili modo macera per horas duas; dein decoque ad octarios duos, et cola.

Macerate for four hours, in a covered vessel, near the fire; then take out the Sarsaparilla and bruise it. When bruised, return it to the liquor, and again macerate in the same manner for two hours; then boil down to two pints, and strain.

These elaborate directions are seldom complied with by the apothecary, and are unnecessary. If the root be thoroughly bruised and beaten in the first instance, properly simmered down, and the decoction duly squeezed out of it after the evaporation, all the soluble materials will be as perfectly obtained as by the above process, and in less than half the time.

We have already adverted to the difference of opinion among medical men respecting the virtues of sarsaparilla; and pharmaceutical writers are equally divided as to the most efficacious species, and as to the best mode of extracting its virtues. Dr. Paris * says, that it is rarely boiled long enough for this purpose; and Mr. Thomson † thinks that long boiling injures it, and that it yields up all its medicinal qualities by mere maceration in warm water. As far as our experience and experiments go, the virtue of sarsaparilla does not reside exclusively in the cortical part, but is also to be sought for in the amylaceous covering of the central woody fibre, which is dissolved by due boiling, without, as far as we can judge, any injury to the extractive matter of the bark; and we do not hesitate in giving preference to the amylaceous over the fibrous or bearded variety of the root. Under the head "Extract of Sarsaparilla" some further observations will be found upon this subject; and our opinion of its medical uses is stated under the article "Sarsaparillæ Radix," in the Materia Medica.

Sarsaparilla requires generally to be given in considerable doses, and the above decoction is therefore used as a vehicle for the extract, and sometimes for the powder; but it should not be too indiscriminately administered in very large quan-

* Pharmacologia, vol. ii. p. 178.

† Lond. Disp., 1822, p. 755.

tities, which often permanently offend the stomach, especially in cases of dyspeptic debility.

Decoctum Sarsaparillæ Compositum.

℞ Decocti Sarsaparillæ ferventis octarios quatuor,
Sassafras Radicis concisæ,
Guaiaci Ligni rasi,

Glycyrrhizæ Radicis contusæ, singulorum unciam,
Mezerei Radicis Corticis ..... drachmas tres;

Decoque per quartam horæ partem, et cola.

Compound Decoction of Sarsaparilla.

Take of Decoction of Sarsaparilla, boiling-hot, four pints,
Sassafras Root, sliced,
Guaiacum Wood in shavings,

Liquorice Root bruised, of each an ounce,
Mezereon Root Bark, three drachms;

Boil for a quarter of an hour, and strain.

Mezereon is the only active addition to the above decoction; but it is added in such small quantity, and is of so doubtful efficacy, that it can scarcely be considered as an important adjunct: the guaiacum wood is useless, but the sassafras and liquorice confer aromatic warmth and sweetness, which may possibly suit some stomachs and palates.

The usual dose of these decoctions is from four ounces to a pint daily. They have been prescribed in chronic rheumatism, in obstinate cutaneous eruptions, in indolent ulcers, and in glandular affections, chiefly under the obscure term of *alterative* remedies; but in such cases they appear entitled to little consideration; not that they are always useless, but that other remedies are preferable. If sarsaparilla deserve any confidence, it is in the after-treatment of syphilis, and in cases where mercury has unkindly affected the system: in such cases it does appear to possess restorative powers not hitherto observed in other remedies, and supports its pretensions to be a medicine not wholly inactive.

Decoctum Senegæ. — *Decoction of Senega.*

℞ Senegæ Radicis unciam, Aquæ octarios duos; Decoque ad octarium, et cola.	Take of Senega Root, an ounce, Water, two pints; Boil down to a pint, and strain.

We have little to add, upon the subject of this preparation, to the remarks which will be found under the head "Senegæ Radix," considered as an article of the Materia Medica. The above decoction is possessed of some acrimony, and has been given in doses of from one to three ounces, twice or three times a day. We have heard it much extolled, in conjunction with guaiacum and ammonia, in chronic rheumatism; but what stimulant has not been tried in that very obstinate complaint? The following, however, was the effective formula:—

℞ Tincturæ Guaiaci f ℥j.
Mellis ℥j. tere simul, et adde
Decoct. Senegæ f ℥jss.
Ammoniæ Subcarbonatis gr. vj.
Fiat haustus sextâ quâque horâ sumendus.

Decoctum Ulmi. — *Decoction of Elm Bark.*

℞ Ulmi Corticis recentis contusi uncias quatuor, Aquæ octarios quatuor; Decoque ad octarios duos, et cola.	Take of fresh Elm Bark bruised, four ounces, Water, four pints; Boil down to two pints, and strain.

A very useless, harmless remedy.—(See *Ulmi Cortex*, page 186.)

Decoctum Veratri.

℞ Veratri Radicis contritæ unciam,

Aquæ octarios duos,
Spiritûs rectificati fluiduncias duas;

Decoque Veratri Radicem ex Aquâ ad octarium, et cola; tum, postquam refrixerit, adjice Spiritum.

Decoction of White Hellebore.

Take of White Hellebore Root in powder, an ounce,
Water, two pints,
Rectified Spirit, two fluid ounces;

Boil the Hellebore Root in the Water down to a pint, and strain; then, when the decoction has cooled, add the Spirit.

It has been already remarked in regard to white hellebore, that it is too uncertain and mischievous to be given internally; and that although benefit has been derived from its external application, it should even then be employed with the utmost circumspection, and in a very diluted state.

EXTRACTS.

In extractis omnibus præparandis, humorem, balneo aquoso, in patinâ quamprimùm consume, donec fiat crassitudo ad pilulas fingendas idonea, et sub finem spathâ assiduè move.

Extractis omnibus mollioribus paululum Spiritûs rectificati insperge.

In preparing all Extracts, quickly, evaporate in a pan, on a water-bath, till they have acquired the proper consistency for making into pills, and, toward the end, stir constantly with a spatula.

Upon all the softer Extracts sprinkle a little rectified Spirit.

Chemists have endeavoured, but not very successfully, to define the term *extract* or *extractive matter*. It is said to be a brown bitterish substance, which, by repeated solutions in water and evaporations, becomes gradually less and less soluble in that liquid, in consequence of absorbing oxygen: it is imperfectly deliquescent, soluble in weak alcohol and in

liquid alkalies, but insoluble in pure alcohol, in ether, and in the acids; it is precipitated from its solutions by chlorine, by sulphate and muriate of alumina, and by muriate of tin; but not by a solution of tan. We, however, find some difficulty in referring to any individual substance in which these characters are well marked; and in general the supposed extractive principle is so intimately blended with other proximate components of plants, and is apparantly so easily modified in its nature by the agents employed in its separation, that it can scarcely be recognised as a distinct definable substance.

There is, however, no ambiguity respecting the term *extract* as it is used in pharmacy: it there implies preparations obtained by evaporating certain vegetable juices, infusions, or decoctions, and may contain, independent of extractive matter, gum, starch, sugar, albumen or gluten, tan, resin, and other substances, among which we may especially enumerate certain compound salifiable bases, the nature of which depends upon the vegetable matter used, such as cinchonia, morphia, strychnia, atropia, veratria, &c. In many cases alcohol is employed in the extraction of the soluble vegetable substances, and the extracts are then termed *alcoholic* or *resinous*.

In the preparation of aqueous extracts, a decoction is made in the usual way, and is evaporated, according to the above official directions, quickly on a water-bath: but rapid evaporation is not easily thus effected; and as it is very desirable speedily to get rid of the moisture, and at a temperature not injurious to the vegetable substances present, other expedients are usually adopted in the pharmaceutical laboratory. Sometimes the evaporation is conducted directly over the fire, by which the extract is invariably injured, and often burnt: sometimes the process is performed in vessels heated by steam, which is by far the least exceptionable method of preparing extracts upon a large scale: in some few instances evaporation at very low temperatures, in vessels exhausted of atmospheric air, and consequently under greatly diminished pressure, is resorted to; but the apparatus required for this purpose is too complicated for general use, and the benefit derived from it, in respect to the activity and efficacy of

the products by no means such as to warrant its general adoption. Mr. Barry's contrivance for the purpose is one of the best that have been invented*.

When alcohol is employed in the preparation of extracts, the evaporation is usually conducted in a still, which should be heated by steam, and the spirit thus drawn off; the process may be finished in the usual way.

Iron, copper, tinned copper, or pewter vessels, are generally used in these evaporations, and in some few cases, basins of earthenware must be employed; and it would have been well if the Pharmacopœia had directed the greater number of the extracts to be evaporated to dryness, or at least to such extent as to become brittle and pulverisable when cold: for when originally of the consistency "fit for making pills," they become, on keeping, too hard for that purpose, and not hard enough to reduce to powder, in which case they are frequently heated, or softened in a hot mortar, before they can be used; and if to be mixed, as is often required, with powders of other substances, it is almost impossible to effect their incorporation by fair means†. It may also be remarked, that when of such consistency as easily to admit of being formed into pills, these invariably flatten, and often adhere and agglutinate in a warm room, or in summer weather.

The sprinkling of extracts with spirits is a useless precaution, for it soon evaporates; when properly dried, they do not become mouldy, if kept in a dry place, but the greater number of them invariably do so if, as is often the case, they are put warm into pots, and tied over, before they have entirely cooled.

The extracts retained in the present Pharmacopœia are few in number compared with those formerly used, and to be found in foreign dispensatories and in the Parisian Codex; but they are quite sufficient for all practical purposes; and even now, a few might be rejected without inconvenience. They are, in many instances, no less convenient than active

* Medico-Chirurgical Transactions, vol. i. p. 231.

† In such cases of difficulty, a hot pestle is an expedient sometimes resorted to.

formulæ, and where it is desirable to prolong the action of a medicine upon the stomach, they may be given in the form of pill; or, they may be dissolved in common or in aromatic distilled waters, and in that way used as substitutes for decoctions, and in some instances for the fresh juices of plants.

Extractum Aconiti. — *Extract of Aconite.*

℞ Aconiti Foliorum recentium libram;

Contunde in mortario lapideo, insperso exiguo Aquæ; dein exprime succum, eumque non defæcatum consume, donec idoneam crassitudinem habeat.

Take of Aconite Leaves fresh, a pound;

Bruise them in a stone mortar, sprinkling upon them a little Water; then press out the juice, and evaporate it until it acquires a proper consistence.

The activity of aconite, and its virtues, are so uncertain, that it is by no means a commendable remedy in any case: it has gained a little celebrity, but upon very doubtful grounds, in the cure of chronic rheumatism, a disease which, after very obstinate and prolonged attacks, not unfrequently disappears spontaneously; hence, an infinity of medicines have had the credit of curing it; among these, aconite appears to have very trifling claims, and as it sometimes is productive of alarming symptoms, it is better let alone. The extract, or inspissated juice, as it is sometimes called, is the only form in which it can conveniently be administered, and this is best given as a pill, either alone or with suitable adjuncts. The incipient dose should not exceed half a grain; sometimes ten grains have had no effect, probably because the extract was good for nothing: the symptoms it produces are nausea, sickness, pain in the region of the stomach, headach, and vertigo. It is very acrid upon the palate, and temporarily paralyses the nerves of taste when a solution of the extract is applied to the tongue. 1 cwt. of fresh aconite yields about 5 lbs of extract.

Extractum Aloës Purificatum.

℞ Aloës spicatæ Extracti contriti libram,
Aquæ ferventis congium;

Macera per triduum leni calore; dein cola, et sepone, ut fæces subsidant. Liquorem defæcatum effunde, et consume, donec idoneam crassitudinem habeat.

Purified Extract of Aloes.

Take of Extract of spiked Aloë in powder, a pound,
Boiling Water, a gallon.

Macerate for three days with a gentle heat; then strain, and suffer the dregs to subside. Pour off the clear liquor, and evaporate until it has a proper consistency.

The object of this preparation of aloes appears to be to get rid of the resinous portion, which, with a quantity of modified extractive matter, is designated in the above formula "fæces," or dregs, and is supposed to contribute to the heating and griping quality of the crude drug; this, however, seems to be an unfounded hypothesis, and the process merely confers a degree of uncertainty upon the action of the medicine, and deprives it of those very peculiarities for which it is generally resorted to. Where, therefore, the large intestines require stimulation, where there is apathy in the uterine system, and that want of energy which we have elsewhere represented aloes as well calculated to restore, we recommend the use of the drug in its usual state. Ten or fifteen grains of the above extract, taken in the form of two or three pills, effectually empties the bowels.

Extractum Anthemidis.

℞ Anthemidis Florum exsiccatorum libram,
Aquæ congium;

Decoque ad octarios quatuor, et liquorem adhuc calentem cola; denique eum consume, donec idoneam crassitudinem habeat.

Extract of Chamomile.

Take of Chamomile Flowers dried, a pound,
Water, a gallon;

Boil down to four pints, and strain the liquor while yet hot; then evaporate it till it has a proper consistence.

Extract of chamomile, in doses of from five to ten grains, twice or thrice a day, is an agreeable bitter to the stomach; but it is simply bitter, all the aroma of the flower having been dissipated by the process of preparing the extract: the lost virtues are in some measure restored in the following formula, which is a good stimulating bitter, or stomachic pill :—two or three for a dose.

℞ Pulveris Florum Anthemidis ℥ss.
Extracti Anthemidis ℥j.
Olei Anthemidis ♏xv.
Fiat massa in pilulas viginti dividenda.

As a vehicle for other tonics, extract of chamomile is one of the best of the simple bitter extracts, and supplies the place of a number of analogous preparations now very properly excluded from the Pharmacopœia; such, for instance, as the extracts of wormwood, lesser centaury, cascarilla, rue, &c.: 1 cwt. of chamomile flowers affords, upon an average, 48 lbs. of extract.

Extractum Belladonnæ.

℞ Belladonnæ Foliorum recentium libram;

Contunde in mortario lapideo, insperso exiguo Aquæ; dein exprime succum, eumque non defæcatum consume, donec idoneam crassitudinem habeat.

Extract of Deadly Nightshade.

Take of Deadly Nightshade Leaves fresh, a pound;

Bruise them in a stone mortar, having sprinkled a little water over them: then press out the juice, and, without separating the dregs, evaporate until it acquires a proper consistence.

Under the title "Belladonnæ Folia" in the Materia Medica, the leading properties of this virulently poisonous extract are detailed; as an internal remedy the extract is a dangerous one. Hahnemann's absurd recommendation of it, as a preservative against the scarlet fever, cannot be too strongly condemned;

no practitioner of common prudence would in any case risk its exhibition in infantile diseases, and especially not upon purely hypothetical grounds.

In continued and intermitting muscular pains, in chronic rheumatic affections, and in cases of extreme cuticular tenderness, without inflammation, a belladonna plaster may, as we have said above, be resorted to, and sometimes with success: in these cases the treatment is always matter of experiment, rather than of certainty, but belladonna deserves trial, as having immediately succeeded where the usual routine of other remedies had failed.

Belladonna plaster is usually made of equal parts of the extract and of lead plaster; it mixes, however, more readily with soap plaster, and this compound is more easily spread upon leather.

1 cwt. of fresh belladonna yields from 4 to 6 lbs. of extract.

Extractum Cinchonæ. — *Extract of Cinchona.*

℞ Cinchonæ lancifoliæ Corticis contusi libram,
Aquæ congium;

Decoque ad octarios sex, et liquorem adhuc calentem cola. Eodem modo, ex pari Aquæ mensurâ quater decoque, et cola. Denique liquores omnes in unum mistos consume, donec idoneam crassitudinem habeant.

Hoc Extractum servari debet *molle*, quod ad pilulas fingendas aptum sit, et *durum*, quod in pulverem teri possit.

Take of lance-leaved Cinchona Bark bruised, a pound,
Water, a gallon;

Boil down to six pints, and strain the liquor while yet hot. In the same manner boil four times successively, in a similar measure of Water, and strain. Lastly, mix all the liquors together, and evaporate until it acquires a proper consistence.

This Extract should be kept *soft*, fit to form pills, and *hard* that it may be reduced to powder.

In this preparation the extractive matter of the bark is probably somewhat modified by the long exposure of its solution to heat and air; but if we suppose that its activity depends upon the presence of a salt of cinchonia, and I have obtained cinchonia from this extract of bark, the changes that

affect its other ingredients will be comparatively of little importance. It is not, however, a very commendable form of the medicine, for, independent of the alteration which the cinchonia itself may suffer in the usual way of preparing it, the strong decoction, especially that made with the addition of a little acid, is to be preferred. The convenience of administering it in the form of a pill is its chief recommendation, and it is not altogether to be rejected in solution, especially dissolved in syrup for the use of children. Those practitioners, however, who confide in sulphate of quinia, usually prescribe it in all cases where the activity of bark is required in its most condensed form.

Extract of bark should always be evaporated to that brittle state in which it may be powdered.

Extractum Cinchonæ Resinosum.

℞ Cinchonæ lancifoliæ Corticis contusi libras duas,
Spiritûs rectificati congium;

Macera per dies quatuor, et cola. Destillet tinctura balneo aquoso, donec idoneam crassitudinem habeat.

Resinous Extract of Cinchona Bark.

Take of lance-leaved Cinchona Bark bruised, two pounds,
Rectified Spirit, a gallon.

Macerate for four days, and strain. Distil the tincture by a water-bath, until it has a proper consistence.

The active matter of the bark is, in this way, very effectually extracted, but the preparation has nothing to recommend it in preference to the former, except that it may be supposed generally to be obtained at a lower temperature, and with less continued application of heat; less risk therefore will be incurred of modifying or decomposing those substances, upon which its effects in disease are presumed to depend.

From ten to twenty or thirty grains of either of these extracts of cinchona may be taken at a dose, and repeated as often as the case requires. It is customary to doubt the efficacy of all the extracts of bark, but we think without sufficient reason, and their convenience often recommends them.

They are often very properly given dissolved in some aromatic water.

One cwt. of fine crown bark yields, on an average, 38 lbs. of watery extract, and 25 lbs. of spirituous or resinous extract.

Extractum Colocynthidis. — *Extract of Colocynth.*

℞ Colocynthidis Pulpæ libram,
Aquæ congium;

Decoque ad octarios quatuor, et liquorem adhuc calentem cola; denique eum consume, donec idoneam crassitudinem habeat.

Take of Colocynth Pulp, a pound,
Water, a gallon;

Boil down to four pints, and strain the liquor while hot; then evaporate it until it has a proper consistence.

After some years' experience of its inutility and inconvenience, it is surprising that this extract should retain its place in the Pharmacopœia. It is invariably either mouldy, or so tough and hard as to resist trituration and formation into pills. Nearly five-sevenths of the pith of the colocynth is soluble in water, so that where any simple preparation of that cathartic, corresponding in efficacy with the above extract, is required, the pith itself may without inconvenience be substituted. But, in such cases, practitioners very properly have recourse to the other drastic purgatives.

Extractum Colocynthidis Compositum. — *Compound Extract of Colocynth.*

℞ Colocynthidis Pulpæ concisæ uncias sex,
Alöes spicatæ Extracti contriti uncias duodecim,
Scammoneæ Gummi-resinæ contritæ uncias quatuor,

Take of Colocynth Pulp sliced, six ounces,
Extract of spiked Aloe in powder, twelve ounces,
Scammony Gum-resin in powder, four ounces,

Cardamomi Seminum contritorum unciam,
Saponis duri uncias tres,
Spiritûs tenuioris congium;

Macera Colocynthidis Pulpam in Spiritu, leni calore, per quatriduum. Liquorem cola, eique adjice Alöen, Scammoneam, et Saponem; dein Spiritum consume, donec idoneam crassitudinem habeat, et, sub finem, Cardamomi Semina admisce.

Cardamom Seeds in powder, an ounce,
Hard Soap, three ounces,
Proof Spirit, a gallon;

Macerate the Pulp of Colocynth in the Spirit for four days with a gentle heat; strain the liquor, and add to it the Aloes, Scammony, and Soap; then evaporate the Spirit until the Extract has a proper consistence, and towards the end, mix in the Cardamom Seeds.

This is a very useful and judicious purgative extract, when carefully made according to the above directions. Some sources of its uncertain activity have been adverted to above, and it is frequently injured, by the necessity of heating it, when it has become hard and tough, before it can be moulded into pills, or blended with other articles: it is one of the extracts which it will always be found most convenient to employ in a hard and brittle state, so that it may be powdered. Much difference of opinion has been entertained respecting the propriety of the addition of the soap, which is supposed to render the extract incompatible with calomel; there appears however to be no just ground for this apprehension, and the soap has the great advantage of increasing the solubility of the compound, so that, when cathartic pills chiefly composed of it have hardened by age, they still retain their activity, and are soluble in the secretions of the stomach.

From five to ten or fifteen grains of this extract is an average dose, but it is generally combined with calomel, or used in smaller quantities to sharpen the activity of rhubarb and of the milder aperients. A few drops of one or other of the essential oils is a proper addition to prevent griping.

℞ Hydrargyri Submuriatis gr. xij.
Extract. Colocynthidis compos. ʒss.
Olei Caryophillorum ♏viij.
Fiant massa in pilulas aperientes octo dividenda; quarum sumantur duæ vel tres pro dosi.

A milder but active aperient pill is composed as follows:—

℞ Pulveris Rhei,
Pilulæ Hydrargyri, ää 3ss.
Extracti Colocynthidis compos. 3j.
Olei Carui ℥xij.
Divide in pilulas xxiv—duæ, tres, vel quatuor, pro dosi.

Extractum Conii. — *Extract of Hemlock.*

℞ Conii recentis libram;

Contunde in mortario lapideo, insperso exiguo Aquæ; dein exprime succum, eumque non defæcatum consume, donec idoneam crassitudinem habeat.

Take of fresh Hemlock Leaves, a pound;

Bruise them in a stone mortar, having sprinkled a little Water upon them; then press out the juice, and evaporate it without suffering the dregs to subside, until it acquires a proper consistence.

This and the corresponding preparations of aconite, henbane, belladonna, and lettuce, were formerly designated "Inspissated Juices" (*Succi Spissati*). In preparing them, we are very properly directed to evaporate the entire juice, and not to cleanse it by the separation of the dregs, or green deposit, which soon takes place in it, and which has sometimes been ordered to be rejected. But the degree of pressure to be used, in obtaining these juices from the fresh herbs, is not adverted to in the Pharmacopœia, and it appears to be a matter of some importance; for if it be obtained by light pressure only, the extract is green, and of rather a mealy consistency; whereas, if the herb be thoroughly bruised, and the whole of the juice expressed by a considerable power, the extract is very dark coloured, much more glutinous or viscid, and, I believe, less active. In respect to hemlock, the stems and stalks of the herb should be carefully excluded, for although when pressed with the leaves they greatly increase the quantity, they certainly diminish the efficacy of the preparation. But the appearance and qualities of extract of

hemlock are by no means always under the operator's command, for they vary extremely with the season, and probably also with the locality of the growth of the herb. It is, I think, an improvement in the preparation of this extract to heat the juice, immediately after its expression, to its boiling point; then to strain, evaporate, and, when it becomes nearly of a proper consistency, to add the feculent matter remaining upon the strainer, which in this way escapes long exposure to heat. The proper preparation of this extract almost necessarily requires the use of a steam-apparatus, for in a water-bath the evaporation is so prolonged as to injure it, and over the open fire it invariably suffers from too high a temperature. 1 cwt. of hemlock yields from 3 to 5 lbs. of extract.

The medical uses of hemlock are stated under the head "Conii Folia" in the Materia Medica. The extract may be prescribed either in the form of pill, or in solution; the latter is the preferable form for children, and it may be given in almond mixture, or any of the usual demulcent vehicles; but in all such cases the administration of any of the narcotics requires very great care and attention as to their effects. The dose is one grain every four or six hours, cautiously increased where the case requires it, to three or four grains, beyond which it should not be carried. Adults may begin with four or five grains for a dose, and it has been extended to twenty grains, which, if the extract be good, is rather a dangerous quantity to administer.

Extract of hemlock should be of a fresh olive-colour; it should not be mouldy, and should be employed as fresh as possible: but as a variety of causes affect its activity, it should always be prescribed in small incipient doses, and with the precautions which we have elsewhere enumerated (pages 81 and 82) in regard to this class of remedies in general.

Extractum Elaterii.	*Extract of Elaterium.*
Elaterii Pepones maturos scinde, et succum levissimè expressum per cribrum setaceum tenuissimum in vas	Slice ripe wild Cucumbers, and strain the juice, very gently expressed through a fine hair sieve into a glass

vitreum cola; deinde per aliquot horas sepone, donec crassior pars subsederit. Rejectâ parte tenuiore supernatante, partem crassiorem leni calore exsicca.

vessel; then set it by for some hours until the thicker part has subsided. Having rejected the thinner supernatant part, dry the thicker part in a gentle heat.

Some remarks upon this preparation, and upon the doses in which it is usually administered, will be found above (see page 83). It is unfortunately a medicine of very uncertain activity, though prepared with every possible precaution; hence the practitioner must carefully feel his way in prescribing it. As a mere purge, in very obstinate cases of constipation, it is not an eligible remedy, and inferior in certainty of operation to the expressed oil of the seeds of the *Croton Tiglium* (see *Tiglii Oleum* in the Materia Medica); but, as a hydragogue cathartic in dropsy, it will frequently evacuate the water where other diuretics and drastic purges fail to produce any such effect. It may be prescribed as follows:—

℞ Extracti Elaterii gr. ij.
Sacchari Purificati ʒj. gr. ij.
Optimè terantur simul, dein in pulveres octo æquales dividentur, quarum capiat æger unum omni horæ quadrante, donec adsit catharsis.

Extractum Gentianæ. — *Extract of Gentian.*

℞ Gentianæ Radicis concisæ libram,
Aquæ ferventis congium;
Macera per horas viginti quatuor; tum decoque ad octarios quatuor, et liquorem adhuc calentem cola: denique eum consume, donec idoneam crassitudinem habeat.

Take of Gentian Root sliced, a pound,
Boiling Water, a gallon;
Macerate for twenty-four hours, then boil down to four pints, and strain the liquor while hot; lastly, evaporate it to a proper consistency.

This is a powerfully bitter extract, and may be substituted for that of chamomile, as a vehicle for metallic salts in the

form of pill; solution is however a preferable form for the greater number of such remedies. It is afforded in the average proportion of 56 lbs. from 1 cwt. of the root.

The following is a good pill in cases where such tonics are proper:—

℞ Ferri Sulphatis ℈j.
Myrrhæ Pulver.
Extract. Gentianæ, āā ʒj.
Divide in pilulas xxx, quarum sumantur ij, vel iij, bis quotidie.

Extractum Glycyrrhizæ. — *Extract of Liquorice.*

℞ Glycyrrhizæ Radicis concisæ libram,
Aquæ ferventis congium;

Macera per horas viginti quatuor; tum decoque ad octarios quatuor, et liquorem adhuc calentem cola; denique eum consume, donec idoneam crassitudinem habeat.

Take of Liquorice Root sliced, a pound,
Boiling Water, a gallon;

Macerate for twenty-four hours; then boil down to four pints, and strain the liquor while hot; lastly, evaporate it until it has a proper consistence.

This extract is an extremely agreeable substitute for that prepared in the South of Europe, and known as "Spanish Liquorice," which, both in its original and purified state, has a nauseous burnt flavour, and is not unfrequently adulterated. It is a useful adjunct to some of the nauseous purgatives, concealing their flavour without interfering with their operation; in this way it is very successfully added to the compound decoction of aloes. Its virtues are merely demulcent, and when used alone, it is generally suffered to dissolve slowly in the mouth, to alleviate tracheal and catarrhal irritation. As an inert vehicle for more active remedies the extract is unobjectionable, but it is apt to be easily softened by warmth, and soon to lose its round form when made into pills. One cwt. of liquorice root affords about 28 lbs. of extract.

Extractum Hæmatoxyli.

℞ Hæmatoxyli Ligni contriti libram,
Aquæ ferventis congium;

Macera per horas viginti quatuor; tum decoque ad octarios quatuor, et liquorem adhuc calentem cola; denique eum consume, donec idoneam crassitudinem habeat.

Extract of Logwood.

Take of Logwood in powder, a pound,
Boiling Water, a gallon;

Macerate for twenty-four hours; then boil down to four pints, and strain the liquor while hot; lastly, evaporate it until it has a proper consistence.

For preparing this extract, the logwood should not be powdered, but rasped, and it should be so far evaporated as to become brittle and pulverulent when cold. 1 cwt. of the wood yields about 20 lbs. of extract. It is considered a good astringent in the treatment of diarrhœa, and has the property, which is sometimes useful, of colouring the stools of a deep purple. It should be given in solution, and may be prescribed as follows:—

℞ Extracti Hæmatoxyli ℈j.
Pulveris pro Mistura Cretæ ʒj.
Aquæ Cinnamomi f ʒx.
Misce pro haustu bis terve in die sumendo.

Or thus, in the form of mixture:—

℞ Extracti Hæmatoxyli ʒjss.
Misturæ Cretæ f ℥vjss.
Tincturæ Cardamomi f ℥jss.
Fiat mistura cujus sit dosis cochlearia tria magna subinde.

Extractum Humuli.

℞ Humuli Strobilorum uncias quatuor,
Aquæ congium;

Decoque ad octarios quatuor, et liquorem adhuc calentem cola; denique eum consume, donec idoneam crassitudinem habeat.

Extract of Hops.

Take of Hops, four ounces,
Boiling Water, a gallon;

Boil down to four pints, and strain the liquor while hot; then evaporate until it has a proper consistency.

This is said to be a bitter and anodyne extract; as a tonic it may perhaps be useful, but as a sedative it has no merit; or, as Dr. Paris says*, "whether it possesses or not any anodyne properties, seems very doubtful." The dose is the same as that of the other bitter extracts.

The average produce of 1 cwt. of hops is 40 lbs. of extract.

Extractum Hyoscyami.	*Extract of Henbane.*
℞ Hyoscyami Foliorum recentium libram;	Take of fresh Henbane Leaves, a pound;
Contunde in mortario lapideo, insperso exiguo Aquæ; dein exprime succum, eumque non defæcatum consume, donec idoneam crassitudinem habeat.	Pound them in a stone mortar, sprinkling a little Water upon them; then express the juice, and evaporate it until it acquires a proper consistence.

The observations made above in respect to the preparation of extract of hemlock, apply also to that of henbane: it has a dingy olive-colour, a peculiar and disagreeable smell, and a bitterish saline taste. Respecting its uses some remarks will be found under the article "Hyoscyami Folia" in the Materia Medica; it is generally prescribed in pills, and is a valuable and active narcotic. 1 cwt. of the fresh herb affords between 4 and 5 lbs. of extract.

In habitual costiveness it may be conjoined with cathartics, which it deprives partly of their irritating and griping quality, without otherwise affecting their operation.

℞ Extract. Colocynth. compos. ℈ij.
Extract. Hyoscyami ℈j.
Misce et divide in pilulas xij. Sumatur una pro re nata.

In allaying uric irritation it may be united with diuretics, or with alkaline remedies, in those cases where opiates are

* Pharmacologia, vol. ii. p. 195.

productive of inconvenience: it may then be given in doses of about eight grains at bed-time, either alone, or as follows:—

℞ Sodæ Subcarbonatis exsiccatæ,
Extract. Hyoscyami, āā gr. viij.
Ol. Juniperi ♏ ij.
Divide in pilulas quatuor; sumantur horâ decubitûs.

In chronic rheumatism small doses of extract of henbane, with mercurial pills and compound powder of ipecacuanha, may be given every four or six hours; or the following may be taken at bed-time, when the pain comes on in the night, and is relieved by perspiration:—

℞ Pilul. Hydrargyri,
Pulveris Ipecacuanhæ compos.
Extract. Hyoscyami, āā gr. v.
Fiat massa in pilulas iij dividenda. Sumantur horâ somni.

In coughs and pulmonary irritation, Dr. Paris prescribes the following as a very effectual palliative:—

℞ Extracti Conii,
Extracti Hyoscyami, āā gr. v.
Mucilaginis Acaciæ f ʒij.
Tere simul donec quam optimè misceantur, et deinde adde
Liquoris Ammoniæ Acetatis,
Aquæ Puræ, āā f ℥ss.
Syrupi Rhœados f ʒj.
Fiat haustus quartâ quâque horâ sumendus.

Extractum Jalapæ.

℞ Jalapæ Radicis contritæ libram,
Spiritûs rectificati octarios quatuor,
Aquæ congium;

Macera Jalapæ Radicem in Spiritu per quatriduum, et tincturam effunde. Residuum ex Aqua decoque ad octarios duos. Dein tincturam et decoctum

Extract of Jalap.

Take of Jalap Root in powder, a pound,
Rectified Spirit, four pints,
Water, a gallon;

Macerate the Jalap Root in the Spirit for four days, and pour off the tincture; boil down the residue with Water to two pints; then strain the

separatim cola, et hoc consumatur, illa destillet, donec utrumque spissescat. Postremò Extractum cum Resina misce, et consume, donec idoneam crassitudinem habeat.

Servetur hoc Extractum *molle*, quod ad pilulas fingendas aptum sit, et *durum*, quod in pulverem teri possit.

tincture and the decoction separately, and let the latter be evaporated and the former distilled until each thickens. Lastly, mix the Extract with the Resin, and evaporate to a proper consistence.

This extract should be kept *soft* fit to form pills, and *hard* so that it may be reduced to powder.

Where it is an object in practice to obtain the peculiar effects of jalap, the powdered root is a preferable form, which is nearly as active as the above extract when given in the same doses, that is, from ten to twenty grains. Extract of jalap is, however, sometimes a convenient addition to purging pills; it is less irritating, and not so apt to gripe as compound extract of colocynth, and, when mixed with about half its weight of soap, may generally be depended on as a cathartic: or it may be administered in various combinations with calomel, gamboge, scammony, aloes, &c. The following is a good purging pill, where it is desirable to avoid colocynth :—

℞ Extracti Jalapæ gr. x.
Saponis duri gr. v.
Misce, et divide in pilulas tres; sumantur horâ somni.

An aperient draught should be given the following morning.

The pure resinous portion of jalap, obtained by evaporating the alcoholic tincture of the root, is a very good purge; it is somewhat tardy in its operation, but generally evacuates the bowels very effectually, in a dose of between five and ten grains. It has a place in several foreign Pharmacopœiæ.

1 cwt. of jalap affords about 50 lbs. of watery extract, and 15 of resin.

Extractum Lactucæ. — *Extract of Lettuce.*

℞ Lactucæ foliorum recentium libram;

Take of fresh Lettuce Leaves, a pound,

Contunde in mortario lapideo, insperso exiguo Aquæ: dein exprime succum, eumque non defæcatum consume, donec idoneam crassitudinem habeat.

Bruise them in a stone mortar, sprinkling a little Water upon them; then express the juice, and evaporate, until it acquires a proper consistence.

It admits of a question how far this extract was worth retaining in the Pharmacopœia, for it is a most uncertain narcotic, and, unless very carefully and perfectly dried, soon becomes mouldy and inert; and in that state, in consequence of its rare employment, it is generally found in the apothecary's shop. As a substitute for opium, it cannot be put into competition with the extracts of henbane and hemlock, nor is it so active as the preparation described above, under the name of *Lactucarium* (see page 109). The only plea for retaining extract of lettuce, is to prescribe it in those cases of nervous irritability where remedies of little efficacy are sometimes most efficacious. From five to twenty grains may be called a dose. 1 cwt. of lettuce yields between 3 and 4 lbs. of extract.

Extractum Opii.

℞ Opii concisi uncias sedecim,
Aquæ congium;

Opio adjice exiguum Aquæ, et macera per horas duodecim, ut mollescat; tum, instillatâ paulatim reliquâ Aquâ, tere donec quàm optimè misceantur, et sepone, ut fæces subsidant; dein liquorem cola, et consume, donec idoneam crassitudinem habeat.

Extract of Opium.

Take of Opium sliced, sixteen ounces,
Water, a gallon;

Add a little Water to the Opium, and macerate for twelve hours, that it may become soft; then adding by degrees the rest of the Water, rub them together till they are well mixed, and set them by that the dregs may subside; then strain the liquor, and evaporate until it acquires a proper consistence.

We are no advocates for meddling with crude opium, which, if originally good, cannot be improved: and although, in the above process, much of the active matter of the drug is dis-

solved and exists in the extract, much also remains behind, for the "dregs" of the above formula yield no inconsiderable portion of morphia. The preparation, also, has the disadvantage of uncertainty, so that it is sometimes equally active with, and sometimes less active than opium. We have never been able to trace in it any increase of power, and it may generally be given in the usual doses in which opium is administered, and on the same occasions. Between 70 and 80 lbs. of extract are generally obtained from 112 lbs. of opium.

Extractum Papaveris.

℞ Papaveris Capsularum contusarum, demptis seminibus, libram,
Aquæ ferventis congium;

Macera per horas viginti quatuor; tum decoque ad octarios quatuor, et liquorem adhuc calentem cola; denique eum consume, donec idoneam crassitudinem habeat.

Extract of Poppy.

Take of Poppy Capsules, bruised and without seeds, a pound,
Boiling Water, a gallon;

Macerate for twenty-four hours; then boil down to four pints, and strain the liquor, while it is hot. Lastly, evaporate it until it has a proper consistence.

This extract has the leading characters of opium, but in a mild degree; and it may often be given with advantage in cases where opium would be likely to disagree, conjoined with extract of hemlock or of henbane. The average dose for adults is from five to ten grains. It is apt to have a very troublesome consistence, being too hard to form pills, and too tough to reduce to powder: it should always be carefully dried till brittle enough to reduce to the latter state. If prepared over the open fire it is often nearly inert, its morphious principle having been modified or decomposed by heat; it is, therefore, one of those remedies which vary much in activity, and requires to be carefully prepared either in a water-bath, or by the heat imparted by steam of low pressure. 1 cwt. of the capsules, without seeds, (which often amount to nearly half their weight,) affords the average produce of 35 lbs. of extract.

Extractum Rhei. — *Extract of Rhubarb.*

℞ Rhei Radicis contritæ libram,
Spiritûs tenuioris octarium,
Aquæ octarios septem;

Macera per quatriduum leni calore; dein cola, et sepone, ut fæces subsidant. Liquorem effunde, eumque defæcatum consume, donec idoneam crassitudinem habeat.

Take of Rhubarb Root, in powder, a pound,
Proof Spirit, a pint,
Water, seven pints;

Macerate for four days with a gentle heat; then strain, and set by, that the dregs may subside. Pour off the liquor, and, when its dregs have subsided, evaporate until it acquires a proper consistence.

Rhubarb contains about 20 *per cent.* of inert matter, excluded in the preparation of this extract, which, however, is not proportionately active, for it requires to be given nearly in the same doses as the powdered root, and, as far as pills are concerned, there is little choice between the two. The "infusion of rhubarb" is preferable to a weak solution of this extract; but in larger doses it may be prescribed, not inelegantly, dissolved in any aromatic water, and it is less unpleasant to the palate and throat than the powder of the crude drug.

℞ Extracti Rhei ℈j. solve in
Aquæ Carui f3x. et adde
Tincturæ Cardamomi compositæ f3ij.
Fiat haustus meridie sumendus.

Extractum Sarsaparillæ. — *Extract of Sarsaparilla.*

℞ Sarsaparillæ Radicis concisæ libram,
Aquæ ferventis congium;

Macera per horas viginti quatuor; tum decoque ad octarios quatuor, et liquorem adhuc calentem cola; denique eum consume, donec idoneam crassitudinem habeat.

Take of Sarsaparilla Root sliced, a pound,
Boiling Water, a gallon;

Macerate for twenty-four hours; then boil down to four pints, and strain the liquor while hot; lastly evaporate it to a proper consistence.

There is much difference of opinion respecting the activity of this extract, among those who admit the efficacy of other forms of sarsaparilla: it is certainly the worst preparation of that remedy, as it is usually met with, for it is easily decomposed by heat, and always suffers more or less during the protracted evaporation that is required. It is chiefly prescribed, dissolved in the decoction of the root, in doses of from twenty to thirty or forty grains; but an originally strong decoction is a preferable substitute.

The proportion of extract afforded by a given weight of sarsaparilla is extremely various, and samples of the root apparently resembling each other in quality, yield it in very different quantities. From 20 to 30 lbs. have been obtained from 1 cwt.

Extractum Stramonii. — *Extract of Thorn Apple.*

℞ Stramonii Seminum libram,
Aquæ ferventis congium;

Macera per horas quatuor in vase leviter clauso prope ignem; dein Semina exime, et contunde in mortario lapideo: contusa liquori redde. Tum decoque ad octarios quatuor, et liquorem adhuc calentem cola. Denique eum consume, donec idoneam crassitudinem habeat.

Take of Thorn Apple Seeds, a pound,
Boiling Water, a gallon;

Macerate for four hours in a covered vessel near the fire: then take out the Seeds, and bruise them in a stone mortar: having bruised them, return them into the liquor. Then boil down to four pints, and strain the liquor while hot. Lastly, evaporate it until it has a proper consistence.

The inspissated juice of the recent herb is a powerfully acting poison; and although the extract of the seeds has been preferred by some practitioners (see page 176), we are far from possessing any satisfactory evidence in its favour. Either extract is extremely uncertain in its effects; it sometimes appears to allay pain, much in the same way as aconite and belladonna; at others, it induces watchfulness and excites irritability. We shall not greatly err in passing judgment upon it as a dangerous and useless article. Extract of stramonium is said to have quelled maniacal paroxysms, but in

such cases no permanent benefit was ever derived from it. Acccording to Dr. Paris, its value in such diseases was suggested by a very curious process of reasoning, namely, that as it deranged the intellect of the sane, it might possibly correct that of the insane*.

Extractum Taraxaci.	*Extract of Dandelion.*
℞ Taraxici Radicis recentis contusæ libram, Aquæ ferventis congium;	Take of Dandelion Root fresh and bruised, a pound, Boiling Water, a gallon;
Macera per horas viginti quatuor; tum decoque ad octarios quatuor, et liquorem adhuc calentem cola; denique eum consume, donec idoneam crassitudinem habeat.	Macerate for twenty-four hours; then boil down to four pints, and strain the liquor while hot; lastly evaporate it to a proper consistence.

When this extract is carefully prepared, it has an agreeable sweet taste, and is readily soluble in water. In the Materia Medica, under the head "Taraxaci Radix," some of the disorders are mentioned in which good authority has recommended it, especially in hepatic affections, and in certain stages of dyspepsia. It may be given in doses of half a drachm, four or six times a day, dissolved in cinnamon or mint water, a form preferable to that of pill. It has the advantage of producing no mischief, if it does no good, and may, therefore, be prescribed as an alterative in cutaneous affections, and in those derangements of general health which are accompanied by obscure hepatic symptoms, and in which the usual systems of treatment are ineffectual. Taraxacum is thought well of by several foreign writers of eminence, and is by them generally recommended in the form of liquid extract, or, as it is sometimes termed, *mellago taraxaci:* the expressed juice of the fresh root is also occasionally prescribed, in the dose of two fluid ounces every morning, mixed with an equal quantity of milk. It appears to operate as a

* Pharmacologia, vol. ii. p. 195.

mild tonic, gently exciting the secretion of the skin and kidneys. 1 cwt. of the fresh root affords from 20 to 25 lbs. of extract.

MIXTURES.

Under this indefinite term the Pharmacopœia includes a variety of formulæ, several of which might have been preferably entrusted to extemporaneous prescription, and some altogether rejected: they are not of a nature to admit of being kept ready prepared, but should, with the exception, perhaps, of camphor mixture, be made at the time they are prescribed, for some of them are liable to spontaneous decomposition, and others deposit part of the contents originally diffused through the fluid, in an agglutinated and difficultly miscible state.

Mistura Ammoniaci.

℞ Ammoniaci drachmas duas,
Aquæ octarium dimidium;

Tere Ammoniacum cum Aqua paulatim instillata, donec quàm optimè misceantur.

Mixture of Ammoniacum.

Take of Ammoniacum, two drachms,
Water, half a pint;

Rub the Ammoniacum with the Water gradually added to it, till they are perfectly mixed.

This is an advantageous form for the exhibition of ammoniacum, the principal virtues of which have been enumerated under that article in the list of the Materia Medica. Clean tears of the gum-resin should be selected for its preparation, and the mixture should appear uniformly milky. To these suspensions of the resinous matter of the gum-resins in water, the term *lac* or *milk* was formerly applied, and under that term they are still frequently designated in pharmacy.

The mixture of ammoniacum is used as a slightly stimulating expectorant, and is often of much service in dry hoarse coughs, unattended by decided inflammatory action or a quick pulse, and in the cases which have been alluded to above

(page 20). From six drachms to an ounce is the usual dose, and its most elegant accompaniment is almond emulsion; it is thus a favourite vehicle for small doses of squills, or of ipecacuanha, as in the following prescriptions, applicable to the cases mentioned:—

℞ Misturæ Ammoniaci,
Misturæ Amygdalarum, āā f3vj.
Tincturæ Scillæ ɱx.
Misce pro haustu ter die sumendo.

℞ Misturæ Ammoniaci f℥j.
Misturæ Camphoræ f℥ss.
Pulveris Ipecacuanhæ gr. jss.
Tincturæ Camphoræ compos. f3j.
Fiat haustus bis die sumendus.

Solution of acetate of ammonia may often be properly substituted for the camphor mixture in this formula.

Mistura Amygdalarum.	*Mixture of Almonds.*
℞ Confectionis Amygdalarum uncias duas, Aquæ destillatæ octarium; Confectioni Amygdalarum Aquam paulatim inter terendum adjice, donec misceantur; dein cola.	Take of Confection of Almonds, two ounces, Distilled Water, a pint; Gradually add the Water to the Confection of Almonds, by rubbing them together until they are mixed; then strain.

Almond milk, or emulsion of almonds, is well known as an agreeable diluting drink in inflammatory febrile affections, and it is often directed, though upon erroneous principles, in preference to other demulcents, in affections of the urinary organs. It is a commonly employed vehicle for refrigerants in fevers, and for expectorants in affections of the lungs,

though liable to the serious objection of spontaneous decomposition, for it soon separates into a kind of curd and whey, and afterwards becomes sour, especially in the warm rooms of invalids. Where these inconveniencies can be guarded against, its use is unobjectionable, and it very conveniently enables us to alter the form and character of a medicine, by substituting it for water, or other comparatively inert vehicles; a consideration not unfrequently of some importance, especially where a plan of treatment requires to be pursued for a long time. It is an excellent medium for the exhibition of the alkalies and alkaline carbonates in cases of urinary gravel, and they in some measure prevent, or at least postpone, its tendency to decomposition. Nitre, and small doses of the neutro-saline aperients *, tincture of squills, and powder or wine of ipecacuanha, are also properly prescribed in this mixture. When ordered for infants, its tendency to acescency should especially be borne in mind, as it has in that way given rise to troublesome diarrhœa. The following formulæ are added for the sake of illustration:—

In uric diathesis—

℞ Sodæ Carbonatis ℈j.†
Misturæ Amygdalarum f℥jss.
Tinctur. Cardam. compos. f℥ss.
Fiat haustus bis vel ter die sumendus.

A sudorific mixture in inflammatory fever—

℞ Potassæ Nitratis ℥ss.
Liquoris Ammoniæ Acetatis f℥jss.
Vini Antimonii Tartarizati f℥iij.
Misturæ Amygdalarum f℥vj.
Fiat mistura, cujus sit dosis cochlearia tria magna quartâ quâque horâ.

* As in the formula at page 239.

† Carbonate of potassa (as at page 227), subcarbonate of magnesia, solution of potassa or of its subcarbonate, and occasionally subcarbonate of ammonia, may be substituted in proper doses.

As a vehicle for expectorants in catarrh, mixture of almonds may be thus prescribed—

℞ Potassæ Subcarbonatis ℈j.
Succi Limonum recentis f ℥ss.
Mellis despumati f ℥j.
Misturæ Amygdalarum f ℥x.
Vini Ipecacuanhæ ♏xxv.*
Misce pro haustu, mane, meridie, et vesperi sumendo.

Sometimes bitter almonds are employed for emulsions, with a view to their sedative quality; but if we desire thus to administer the prussic acid, it is preferable to have recourse directly to it, or to the oil of bitter almonds (see page 21), than to trust to a more uncertain form.

Mistura Assafœtidæ.

℞ Assafœtidæ drachmas duas,
Aquæ octarium dimidium;
Tere Assafœtidam cum Aqua paulatim instillata, donec quàm optimè misceantur.

Mixture of Assafœtida.

Take of Assafœtida, two drachms,
Water, half a pint;
Rub the Assafœtida with the water gradually added, till they are thoroughly mixed.

Assafœtida is usually given in the form of pills, though the above is sometimes more active, especially in hysteria, both as an antispasmodic and tonic; but in such cases the mixture should be prepared with peppermint or pennyroyal water, and may then be prescribed in the dose of an ounce or an ounce and a half, with volatile alkali and other proper adjuncts. Some formulæ for the administration of assafœtida will be found at page 38, which render any further remarks superfluous in this place. In children the convulsions symptomatic of the irritation of teething are said to be relieved by

* Or, *Tincturæ Scillæ* ♏xv.

a glyster of assafœtida. Where intestinal spasm is concerned, the practice may be admitted.

Mistura Camphoræ.

℞ Camphoræ drachmam dimidiam,
Spiritûs rectificati minima decem,
Aquæ octarium;

Camphoram primùm cum Spiritu tere, deinde cum Aqua paulatim instillata, et cola.

Mixture of Camphor.

Take of Camphor, half a drachm,
Rectified Spirit, ten minims,
Water, a pint;

First rub the Camphor with the Spirit, then with the Water, adding it gradually, and filter.

By this process a very small portion of camphor is retained in solution, yet the mixture, when filtered through paper, is not an inelegant preparation as a vehicle for antispasmodics, where the virtue of camphor is not immediately required. The best forms for the administration of that drug are stated under its name, in the list of the Materia Medica. A camphor mixture or julep, preferable to the above, may be made with less trouble by mixing half a fluid ounce of camphorated spirit with an equal quantity of rectified spirit, and adding the mixture at once to half a gallon of water, with which it must be thoroughly shaken.

Mistura Cornu Usti.

℞ Cornuum ustorum uncias duas,
Acaciæ Gummi contriti unciam,
Aquæ octarios tres:

Decoque ad octarios duos, assiduè movens; tum cola.

Mixture of Calcined Hartshorn.

Take of calcined Hartshorn, two ounces,
Gum Arabic, an ounce,
Water, three pints;

Boil down to two pints, constantly stirring, and strain.

The absurdity of retaining this "mixture" in the Pharmacopœia merits reproof.

Mistura Cretæ.

℞ Cretæ præparatæ unciam dimidiam,
Sacchari purificati drachmas tres,
Acaciæ Gummi contriti unciam dimidiam,
Aquæ octarium;

Misce.

Mixture of Chalk.

Take of prepared Chalk, half an ounce,
Refined Sugar, three drachms,
Gum Arabic in powder, half an ounce,
Water, a pint;

Mix.

There is nothing decidedly objectionable in this mixture, but it might, without any inconvenience, have been left to extemporaneous prescription. The sugar is often required to be omitted; and in place of common water, some one of the aromatic distilled waters is usually preferable. It is almost exclusively used in common diarrhœa, combined with astringents, as in the formulæ at pages 55 and 65.

Mistura Ferri Composita.

℞ Myrrhæ contritæ drachmam,
Potassæ Subcarbonatis grana viginti quinque,
Aquæ Rosæ fluiduncias septem cum semisse,
Ferri Sulphatis contritæ scrupulum,
Spiritûs Myristicæ fluidunciam dimidiam,
Sacchari purificati drachmam;

Myrrham cum Spiritu Myristicæ et Potassæ Subcarbonate simul tere,

Compound Mixture of Iron.

Take of Myrrh, in powder, a drachm,
Subcarbonate of Potassa, twenty-five grains,
Rose Water, seven ounces and a half,
Sulphate of Iron, in powder, a scruple,
Spirit of Nutmeg, half a fluid ounce,
Purified Sugar, a drachm;

Rub the Myrrh well with the Spirit of Nutmeg and Subcarbonate

hisque, inter terendum, primùm Aquam Rosæ cum Saccharo, deinde Ferri Sulphatem adjice. Misturam statim in vas vitreum idoneum immitte, idque obtura.

of Potassa, and to these, whilst rubbing, add first the Rose Water with the Sugar, and then the Sulphate of Iron. Put the mixture immediately into a proper glass bottle, and stop it.

This mixture has been adverted to in speaking generally of the uses of iron, under the article "Ferrum," in the Materia Medica. It is nearly the same as the celebrated antihectic mixture of Dr. Griffith. When carefully prepared, according to the above formula, it is of a deep green colour, which it retains if excluded from the contact of air, and the deposite which separates is at any time again easily diffused through it by agitation. It is said to be preferably prepared by selecting a lump of fine myrrh of the proper weight, and triturating it in the first instance into a perfectly even emulsion with the rose water; then adding the spirit of nutmeg, subcarbonate of potassa, and sugar; and, lastly, dissolving in it the sulphate of iron.

This is an excellent and valuable tonic, frequently admissible where other preparations of iron cannot be employed: if it feel cold upon the stomach, an additional drachm of spirit of nutmeg may be added to each dose, which also prevents griping; sometimes it constipates, but that effect usually goes off after the first few doses. From one to two ounces may be given, as occasion requires, from once to four times a day; an ounce and a half twice a day, namely at noon and an hour before dinner, is generally the right thing to begin with; and, if it agrees, it improves the appetite, increases the tone of the muscular fibre, and ameliorates the general complexion of the patient more safely and decidedly than the other chalybeates (see page 85).

Mistura Guaiaci. *Mixture of Guaiacum.*

℞ Guaiaci Gummi-resinæ drachmam cum semisse,

Take of Guaiacum Gum-resin, a drachm and a half,

Sacchari purificati drachmas duas,
Mucilaginis Acaciæ Gummi fluidrachmas duas,
Aquæ Cinnamomi fluiduncias octo;

Tere Guaiacum cum Saccharo, deinde cum Mucilagine, hisque, interterendum, Aquam Cinnamomi paulatim adjice.

Purified Sugar, two drachms,
Mucilage of Gum Arabic, two fluid drachms,
Cinnamon Water, eight fluid ounces;

Rub the Guaiacum with the Sugar, then with the Mucilage, and to these, whilst rubbing, gradually add the Cinnamon Water.

From half an ounce to an ounce and a half of this mixture may be given twice or thrice daily, in cases where simple guaiacum is required: it is, however, seldom conveniently given alone, requiring some of the adjuncts pointed out above, at pages 91 and 92; and, upon the whole, this *mistura guaiaci* cannot be regarded as a useful formula.

Mistura Moschi.

℞ Moschi,
Acaciæ Gummi contriti,
Sacchari purificati, singulorum drachmam,
Aquæ Rosæ fluiduncias sex;

Tere Moschum cum Saccharo, deinde cum Gummi, instillata paulatim Aqua Rosæ.

Mixture of Musk.

Take of Musk,
Gum Arabic in powder,
Refined Sugar, of each a drachm,
Rose Water, six fluid ounces;

Rub the Musk with the Sugar, then with the Gum, adding the Rose Water by degrees.

The efficacy of musk, under any form, is doubtful, and it is at all events best left to extemporaneous prescription. Ammonia, æther, and camphor, are its usual adjuncts, and they may be combined with the above mixture, or recourse may be had to the formulæ given at page 119.

SPIRITS.

Under the articles "Spiritus Rectificatus" and "Spiritus

Tenuior," in the Materia Medica, the general medicinal characters of the different wines and spirituous liquors in common use are described; and it is there stated that the rectified spirit of the Pharmacopœia is a mixture of alcohol and water, in the proportion, by measure, of 96.50 of alcohol to 3.50 of water. The alcohol, however, there referred to, is assumed as having a specific gravity of .825 at the temperature of 60°; a specific gravity at which it still retains a considerable proportion of water, of which it may to a great extent be further deprived by distilling it with substances which, in consequence of their strong attraction for water, either abstract it, or prevent it rising in vapour, at temperatures sufficient for the distillation of alcohol.

One of these methods is resorted to in the following formula from the Pharmacopœia:—

Alcohol.

℞ Spiritûs rectificati congium,
Potassæ Subcarbonatis libras tres;

Spiritui injice Potassæ Subcarbonatis libram, ad gradum trecentesimum prius calefactam, et per horas viginti quatuor macera, sæpiùs movens; tum effuso Spiritui adjice Potassæ Subcarbonatis quod reliquum est, ad eundem gradum calefactum; denique balneo aquoso destillet Alcohol, quod servandum est in vase obturato.

Alcoholis pondus specificum est ad pondus specificum Aquæ destillatæ, ut .815 ad 1.000.

Alcohol.

Take of rectified Spirit, a gallon,
Subcarbonate of Potassa, three pounds;

Add a pound of the Subcarbonate of Potassa, previously heated to 300°, to the Spirit, and macerate for twenty-four hours, frequently stirring; then having poured off the Spirit, add to it the rest of the Subcarbonate of Potassa heated to the same degree; lastly, with the aid of a water-bath, let the Alcohol distil over, which keep in a well-stopped vessel.

The specific gravity of Alcohol is to the specific gravity of distilled Water, as .815 to 1.000.

The effect of adding the first portion of the subcarbonate of potassa to the rectified spirit, is the gradual abstraction of a large portion of the water previously combined with it, so that the liquor separates into two portions, the lowermost of which is an aqueous solution of the alkaline salt; the spirit which floats upon it is then decanted, the remainder of the sub-

carbonate is added, and the alcohol is distilled off, the process being most conveniently conducted, if on a small scale, in a tubulated glass retort, or in an alembic of any required dimensions.

Subcarbonate of potassa, though exceedingly soluble in, and strongly attracting water, is perfectly insoluble in alcohol, and is therefore well adapted for the first part of the above process; but a purer alcohol may be obtained by employing, in the second or distillatory part of the process, a portion of chloride of calcium, which more perfectly abstracts and retains the remaining water. There is, however, no pharmaceutical process or preparation for which the strongest alcohol is absolutely necessary, and the formula might have been altogether omitted without inconvenience.

The strongest alcohol which has yet been procured has a specific gravity of .796 at the temperature of 60°, and is by some considered as entirely free from water, and therefore is *pure* alcohol. The alcohol above directed, of the specific gravity .815, consists of about 93 *per cent. by weight*, of such pure alcohol, and 7 of water; and the rectified spirit of the Pharmacopœia (specific gravity .835) contains about 85 *per cent. by weight* of the pure alcohol, and 15 of water.

Alcohol, purified by these processes, is a colourless and transparent liquid, of a fragrant odour and an extremely strong penetrating flavour. It has never been frozen. It is extremely volatile, and when of the specific gravity .825 it boils, under mean atmospheric pressure, at the temperature of 176°; but its boiling point of course varies considerably with its degree of purity. It readily mixes in all proportions with water, heat being evolved, and a considerable increase of density ensuing, the precise extent of which may be learned from Mr. Gilpin's tables*; one of which, that calculated to the temperature of 60°, is reprinted in my Manual of Chemistry, for the convenience of reference.

Alcohol burns with a pale blue flame, and the products of its combustion in oxygen are carbonic acid and water; it is decomposed when passed through a red hot tube, and by a

* Phil. Trans., 1794.

careful examination of the products of its combustion, and of its decomposition, chemists have endeavoured to ascertain the precise weight of its ultimate elements. The experiments of Saussure upon this subject appear to have been made with great care, and may therefore be adopted as near approximations to correctness; from them it appears, that assuming 100 parts of alcohol of the specific gravity of .830 at 60°, to consist of 13.8 water and 86.2 real or anhydrous alcohol, the latter affords on decomposition—

Carbon	51.98 =	2 proportionals.....(6×2)	= 12
Oxygen.....	34.32 =	1 ditto.....	= 8
Hydrogen	13.70 =	3 ditto .....(1×3)	= 3
	100.		23

The annexed theoretical proportionals very nearly agree with the experimental result, and the elements bear such relation to each other, as to enable us to represent absolute alcohol as a compound of—

2 proportionals of Carburetted Hydrogen.....	(7×2)	= 14
1 ——— Water.....		= 9
		23

Or, adopting M. Gay Lussac's view of its composition, as consisting of one volume of carburetted hydrogen and one of aqueous vapour, the *two* volumes being condensed into *one* by combination, an estimate closely agreeing with the specific gravity of the vapour of alcohol; for the specific gravity of olefiant gas compared with atmospheric air is .978, and that of aqueous vapour .625, which added together = 1.603; and the specific gravity of the vapour of alcohol is 1.613.

The medical and pharmaceutical uses of alcohol have already been adverted to in other parts of this work. It is employed in various combinations and states of dilution as a powerful and diffusible stimulus, of which the physician avails himself in all cases where it is requisite quickly to rouse the powers of the system, or to maintain increased vascular action and nervous energy. The *modus operandi* of alcohol appears to be distinctly shewn by the experiments

of Mr. Brodie to consist in disturbance of the action of the brain, induced through the medium of the nerves of the stomach, and not by any direct absorption, as some have supposed. In experiments in which he killed animals by the injection of spirits into the stomach *, he always found that organ inflamed, but no preternatural appearances in the brain; and sometimes death was so instantaneously produced as to exclude all suspicion of the possibility of ordinary absorption. That the general effects of alcohol upon the system arise from its action upon the nerves of the stomach is, in some instances, further shewn by a person who is intoxicated becoming suddenly sober after vomiting.

Alcohol more or less diluted is very frequently employed as an external stimulus, and is occasionally added to lotions with a view to the cold which it creates by evaporation.

As a pharmaceutical agent, alcohol is a powerful solvent of the resins, of essential oils, and several other of the proximate vegetable principles, as seen in the tinctures, spirits, and other alcoholic preparations of the Pharmacopœia.

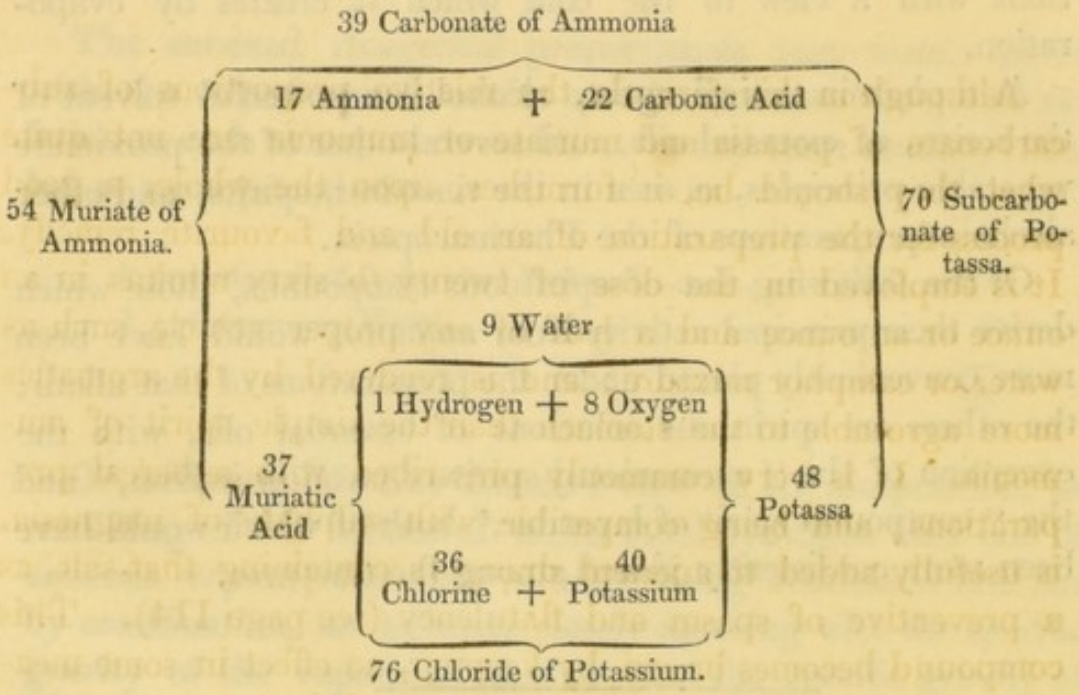
Of the following list of spirituous compounds, those which derive their principal activity from ammonia would have been more conveniently placed under the preparations of that alkali; the others are spirituous solutions of essential oils, with the exception of the "ammoniated spirit of meadow saffron," and the "compound spirit of lavender," both of which would have been more consistently placed among the tinctures.

Spiritus Ammoniæ.	*Spirit of Ammonia.*
℞ Spiritûs tenuioris octarios tres,	Take of Proof Spirit, three pints,
Ammoniæ Muriatis uncias quatuor,	Muriate of Ammonia, four ounces,
Potassæ Subcarbonatis uncias sex;	Subcarbonate of Potassa, six ounces;
Misce, et lento igne in receptacu-	Mix, and, with a slow fire, let a

* Phil. Trans., 1811, p. 182.

lum frigefactum destillet octarius cum semisse.	pint and a half be distilled over into a cooled receiver.

In this humid decomposition of muriate of ammonia by subcarbonate of potassa the results do not coincide with those above stated, as occurring during the decomposition of the muriate by carbonate of lime in the dry way (see page 212). In the present instance, a *carbonate* and not a sesquicarbonate of ammonia appears to be formed, which passes over with and is dissolved by the alcohol, while the residuary water holds chloride of potassium in solution. The following diagram exhibits the mutual decomposition of the salts, and the annexed equivalent numbers shew their required weights, and those of the products:—



It appears, therefore, that the formula prescribes the subcarbonate in some excess, which is correct, as allowing for the water contained in that salt in the state in which it usually occurs.

Spirit of ammonia is a transparent colourless fluid, of a pungent smell and acrid taste, principally employed in the preparation of other ammoniated formulæ, and occasionally as a stimulating liniment, either alone, or mixed with the *Linimentum Saponis Compositum*. The following is its usual substitute in all prescriptions for internal use:—

Spiritus Ammoniæ Aromaticus.	*Aromatic Spirit of Ammonia.*
℞ Cinnamomi Corticis contusi,	Take of Cinnamon Bark bruised,
Caryophyllorum contusorum, singulorum drachmas duas,	Cloves bruised, of each two drachms,
Limonum Corticis uncias quatuor,	Lemon Peel, four ounces,
Potassæ Subcarbonatis libram dimidiam,	Subcarbonate of Potassa, half a pound,
Ammoniæ Muriatis uncias quinque,	Muriate of Ammonia, five ounces,
Spiritûs rectificati octarios quatuor,	Rectified Spirit, four pints,
Aquæ congium;	Water, a gallon;
Misce, et destillent octarii sex.	Mix, and let six pints be distilled.

Although in this formula the relative proportions of subcarbonate of potassa and muriate of ammonia are not quite what they should be, it furnishes, upon the whole, a good process for the preparation of an old and favourite remedy. It is employed in the dose of twenty to sixty minims in an ounce or an ounce and a half of any proper vehicle, such as water or camphor mixture; and is rendered by the aromatics more agreeable to the stomach than the simple spirit of ammonia. It is very commonly prescribed with æthereal preparations; and being compatible with sulphate of magnesia, is usefully added to aperient draughts containing that salt, as a preventive of spasm and flatulency (see page 114). This compound becomes brown by keeping, an effect in some measure to be attributed to the essential oil of cloves.

Spiritus Ammoniæ Fœtidus.	*Fetid Spirit of Ammonia.*
℞ Spiritûs Ammoniæ octarios duos,	Take of Spirit of Ammonia two pints,
Assafœtidæ uncias duas;	Assafœtida, two ounces;
Macera per horas duodecim; tum	Macerate for twelve hours; then,

lento igne in receptaculum frigefactum destillet octarius cum semisse.

with a slow fire, let a pint and half be distilled over into a receiver kept cold.

By distilling assafœtida with spirit of ammonia, a solution of the volatile odorous principle of the gum-resin is obtained; but this preparation is rarely resorted to, and might without any inconvenience have been omitted, since a combination of spirit of ammonia and tincture of assafœtida, extemporaneously made, may always be substituted for it. When prescribed, it is in nervous and hysterical cases, in the dose of about one drachm.

Spiritus Ammoniæ Succinatus.

℞ Mastiches drachmas tres,
Spiritûs rectificati fluidrachmas novem,
Lavandulæ Olei minima quatuordecim,
Succini Olei minima quatuor,
Liquoris Ammoniæ fluiduncias decem;

Mastichen in Spiritu macera, ut liquetur, et tincturam defæcatam effunde; tum cætera adjice, et omnia simul agita.

Succinated Spirit of Ammonia.

Take of Mastich, three drachms,
Rectified Spirit, ... nine fluid drachms,
Oil of Lavender, fourteen minims,
Oil of Amber, four minims,
Solution of Ammonia, ten fluid ounces;

Macerate the Mastich in the Spirit, that it may be dissolved, and pour off the clear tincture; then add the other ingredients, and shake them all together.

This is intended as a substitute for *Eau de Luce*, and is given as a powerful nervous stimulant, supposed to derive some additional efficacy from the oil of amber. The dose is about twenty or thirty minims in an ounce and a half of camphor mixture. In India it has gained some celebrity as a remedy in cases of the bites of poisonous snakes, cases in which ammonia and other stimulants are generally proper. Its odour would be more agreeable without the oil of amber. The mastich is added to confer a permanent milkiness upon the mixture.

Spiritus Anisi.

℞ Anisi Seminum contusorum libram dimidiam,
Spiritûs tenuioris congium,
Aquæ quod satis sit ad prohibendum empyreuma;

Macera per horas viginti quatuor; tum lento igne destillet congius.

Spirit of Aniseed.

Take of Aniseed bruised, half a pound,
Proof Spirit, a gallon,
Water, a sufficient quantity to prevent empyreuma;

Macerate for twenty-four hours; then, with a slow fire, let one gallon be distilled over.

This, and several analogous solutions of essential oils in proof spirit, may also be extemporaneously prepared by employing the oil, instead of the seed or other part of the plant prescribed; but they are then more apt to remain milky, unless a stronger than proof spirit be used.

Spirit of aniseed is a good stomachic, and quells flatulency; it may be rendered a pleasant *liqueur*, known among the French under the name of *crême d'anise* or *anisette*, by duly sweetening it with refined sugar.

Spiritus Armoraciæ Compositus.

℞ Armoraciæ Radicis recentis concisæ,
Aurantii Corticis exsiccati, singulorum libram,
Myristicæ Nucleorum contusorum unciam dimidiam,
Spiritûs tenuioris congium,
Aquæ quod satis sit ad prohibendum empyreuma;

Macera per horas viginti quatuor; tum lento igne destillet congius.

Compound Spirit of Horseradish.

Take of Horseradish Root fresh and sliced,
Dried Orange Peel, of each a pound,
Nutmegs bruised, half an ounce,
Proof Spirit, a gallon,
Water, a sufficient quantity to prevent empyreuma;

Macerate for twenty-four hours; then, with a slow fire, let one gallon be distilled.

This is a remnant of one of the antiscorbutic spirits of old

pharmacy; they are of no peculiar efficacy, and the above, with the rest, might have been consigned to oblivion.

Spiritus Camphoræ.	*Spirit of Camphor.*
℞ Camphoræ uncias quatuor, Spiritûs rectificati octarios duos; Misce, ut liquetur Camphora.	Take of Camphor, four ounces, Rectified Spirit, two pints; Mix, that the Camphor may be dissolved.

Alcoholic solution of camphor is a very convenient form of that drug; it may be given in the dose of from five to twenty drops in a wine-glassful of water, as an extemporaneous camphor julep; and may be employed as above stated, in the preparation of camphor mixture. With olive oil, or compound soap liniment, or spirit of ammonia, it forms a valuable application to strains and parts affected with chronic rheumatism; and it is often used with success as a discutient application to chilblains. Applied on a linen rag to an incipient whitloe, it not unfrequently dissipates the inflammation it is also used as a stimulant and antiputrefactive in many cases of gangrene.

Spiritus Carui.	*Spirit of Caraway.*
℞ Carui Seminum contusorum libram cum semisse, Spiritûs tenuioris congium, Aquæ quod satis sit ad prohibendum empyreuma; Macera per horas viginti quatuor; tum lento igne destillet congius.	Take of Caraway Seeds bruised, a pound and a half, Proof Spirit, a gallon, Water, a sufficient quantity to prevent empyreuma; Macerate for twenty-four hours; then, with a slow fire, distil one gallon.

Oil of caraway, thus dissolved, constitutes a very comfortable carminative, especially when the compound is sweet-

ened with refined sugar: it then forms a dram much used in Germany, and when had recourse to in moderation is effective and agreeable as a preventive of flatulency. The principal medicinal use of this spirit and its associates in the Pharmacopœia, is as an addition to formulæ containing metallic salts, or other preparations which are decomposed or discoloured by the vegetable substances held in solution by the tinctures.

Spiritus Cinnamomi.

℞ Olei Cinnamomi *pondere* scrupulos quinque,
Spiritûs rectificati octarios quatuor cum semisse;

Oleo Spiritum adjice, et tantum Aquæ affunde, ut post destillationem supersit quod satis sit ad prohibendum empyreuma; tum lento igne destillet congius.

Spirit of Cinnamon.

Take of Oil of Cinnamon, *by weight*, five scruples,
Rectified Spirit, four pints and a half;

Add the Spirit to the Oil, and pour on them so much water that, after distillation, enough may remain to prevent empyreuma; then, with a slow fire, let distil one gallon.

This spirit might, with equal propriety, have been distilled, as formerly, from cinnamon bark. It is a heating but agreeable cordial; unnecessarily, however, retained in the Pharmacopœia.

Spiritus Colchici Ammoniatus.

℞ Colchici Seminum contusorum uncias duas,
Spiritûs Ammoniæ aromatici octarium;

Macera per dies quatuordecim et cola.

Ammoniated Spirit of Meadow Saffron.

Take of Meadow Saffron Seeds bruised, two ounces,
Aromatic Spirit of Ammonia, a pint;

Macerate for fourteen days, and strain.

The seeds of colchicum are by some preferred to the root,

as being less liable to disorder the stomach and bowels, and equally effective in other respects; but the above spirit, or rather tincture, is not a convenient formula, inasmuch as it is often desirable to omit the ammonia, and as, whenever it is requisite, it might have been extemporaneously added. There are several preparations of colchicum in the Pharmacopœia; none of them, in our opinion, unobjectionable. A tincture of the dried root (prepared with the precautions pointed out by Mr. Thomson, and quoted at page 66,) in proof spirit, furnishes a very effective form; a prescription for which, for the reason just stated, is here inserted:—

℞ Colchici Radicis concisæ et siccatæ ℥ij.
Spiritûs tenuioris, octarium;
Macera per dies quatuordecim, et per chartam cola. Sit dosis f℥ss. ad f℥ij.

Spiritus Juniperi Compositus.

℞ Juniperi Baccarum contusarum libram,
Carui Seminum contusorum,
Fœniculi Seminum contusorum, singulorum unciam cum semisse,
Spiritûs tenuioris congium,
Aquæ quod satis sit ad prohibendum empyreuma;

Macera per horas viginti quatuor; tum lento igne destillet congius.

Compound Spirit of Juniper.

Take of Juniper Berries bruised, a pound,
Caraway Seeds bruised,
Fennel Seeds bruised, of each an ounce and a half,
Proof Spirit, a gallon,
Water, a sufficient quantity to prevent empyreuma;

Macerate for twenty-four hours; then, with a slow fire, let one gallon be distilled.

This is generally regarded as a diuretic, and as such occasionally prescribed in conjunction with other remedies of that class, as in the prescription at page 107; it is, however, a very insignificant auxiliary, and by no means to be considered as a useful formula.

Spiritus Lavandulæ. — *Spirit of Lavender.*

℞ Lavandulæ Florum recentium libras duas,
Spiritûs rectificati congium,
Aquæ quod satis sit ad prohibendum empyreuma;

Macera per horas viginti quatuor; tum lento igne destillet congius.

Take of fresh Lavender Flowers, two pounds,
Rectified Spirit, a gallon,
Water, a sufficient quantity to prevent empyreuma;

Macerate for twenty-four hours; then, with a gentle fire, let one gallon be distilled.

This very unimportant pharmaceutical preparation forms a part of the next formula, and of that for compound camphor liniment, in both of which essential oil of lavender might have been unobjectionably substituted; nor is there any necessity to resort to the recent flowers as above directed, for those which are carefully dried yield an equally fragrant product. As this preparation is made with rectified spirit, it may be substituted for it in lotions and other cases, where we wish to avail ourselves of the perfume, which is one of the most agreeable that we possess.

What is sold under the name of *lavender water* is, with very few exceptions, not a distilled spirit, but an alcoholic solution of oil of lavender, to which other scents are occasionally added. Each manufacturer has generally his own recipe, so that here we can only give one of the most approved as a sample:—

Take of Rectified Spirit of Wine, 5 gallons,
Essential oil of Lavender, 20 ounces,
——————— Bergamotte, 5 ounces,
Essence of Ambergris*, half an ounce.
Mix.

Four ounces of powdered orris root are sometimes digested

* Made by digesting one drachm of ambergris and eight grains of musk in half a pint of alcohol.

These essences, containing ambergris and musk, were formerly much used as cordials and antispasmodics. The following is one of the most celebrated of

in the above, to soften and improve its flavour, which also is materially ameliorated by keeping.

Spiritus Lavandulæ Compositus.

℞ Spiritûs Lavandulæ octarios tres,
Spiritûs Rosmarini octarium,
Cinnamomi Corticis contusi,
Myristicæ Nucleorum contusorum,
singulorum unciam dimidiam,
Pterocarpi Ligni concisi unciam;

Macera per dies quatuordecim, et cola.

Compound Spirit of Lavender.

Take of Spirit of Lavender, three pints,
Spirit of Rosemary, a pint,
Cinnamon Bark bruised,
Nutmegs bruised, of each half an ounce,
Red Saunders Wood sliced, an ounce;

Macerate for fourteen days, and strain.

This is a common and convenient domestic restorative, resorted to in languors, spasms, and flatulency, and is most conveniently taken in the dose of twenty to sixty drops, upon a lump of sugar. With the same intention it occasionally forms an article in prescriptions, but in that way its flavour is

these formulæ, called in the old Paris Pharmacopœia *Tinctura Regia.* The civet may be omitted without detriment.

℞ Ambræ Griseæ veræ ℈ij.
Moschi ℈j.
Zibethi gr. x.
Olei Ess. Cinnamomi gutt. vj.
——— Ligni Rhodii gutt. iv.
Spiritûs Vini odore florum Rosæ et
Aurantii impregnati ℥ivss.
Solvatur ambra leniter ebulliendo in hôc spiritu, et deinceps volatiliora, addantûr. Dosis, gutt. x. ad xxx. è vino.

Hæc tinctura, parcâ quantitate rebus odoratis adstillatâ, illarum aroma mirè exaltat.

not very agreeable. A teaspoonful of *lavender drops*, in a wine-glassful of camphor julep, is a sovereign remedy for low spirits.

Spiritus Menthæ Piperitæ. — *Spirit of Peppermint.*

℞ Olei Menthæ piperitæ *pondere* scrupulos sex cum semisse,
Spiritûs rectificati octarios quatuor cum semisse;

Oleo Spiritum adjice, et tantum Aquæ affunde, ut post destillationem supersit quod satis sit ad prohibendum empyreuma; tum lento igne destillet congius.

Take of Oil of Peppermint, *by weight*, six scruples and a half,
Rectified Spirit, four pints and a half;

Add the Spirit to the Oil, and pour on them so much Water, that, after distillation, enough may remain to prevent empyreuma; then, with a slow fire, let one gallon be distilled.

In this and the following spirit, the essential oils are now substituted for the dried herbs, which were formerly not inconveniently employed in the proportion of a pound and a half to a gallon of proof spirit. The present formulæ yield preparations of more equable strength or flavour, but they are unimportant and useless incumbrances to the Pharmacopœia. What is generally termed *essence of peppermint* is a good carminative, in the dose of eight or ten drops upon a lump of sugar. It is a solution of one part of essential oil of peppermint in three of alcohol, and is sometimes coloured green by a little spinach juice. A compound of gin and oil of peppermint is much esteemed by the vulgar as a cordial dram.

Spiritus Menthæ Viridis. — *Spirit of Spearmint.*

℞ Olei Menthæ viridis *pondere* scrupulos sex cum semisse,
Spiritûs rectificati octarios quatuor cum semisse;

Oleo Spiritum adjice, et tantum

Take of Oil of Spearmint, *by weight*, six scruples and a half,
Rectified Spirit, four pints and a half;

Add the Spirit to the Oil, and pour

Aquæ affunde, ut post destillationem supersit quod satis sit ad prohibendum empyreuma; tum lento igne destillet congius.

on them so much Water, that, after distillation, enough may remain to prevent empyreuma; then, with a slow fire, let one gallon be distilled.

Like most of the other spirits, that of spearmint is prescribed in the dose of half a drachm to two drachms, as a warming and flavouring addition to draughts and mixtures An *essence of mint* may be prepared as that of peppermint, and a stomachic liqueur consisting of rectified brandy, oil of mint, and sugar, is much esteemed abroad as a liqueur, under the name of *crême de menthe*.

Spiritus Myristicæ. — *Spirit of Nutmeg.*

℞ Myristicæ Nucleorum contusorum uncias duas,
Spiritûs tenuioris congium,
Aquæ quod satis sit ad prohibendum empyreuma;

Macera per horas viginti quatuor; tum lento igne destillet congius.

Take of Nutmegs bruised, two ounces,
Proof Spirit, a gallon,
Water, a sufficient quantity to prevent empyreuma;

Macerate for twenty-four hours; then, with the aid of a slow fire, let one gallon distil over.

This spirit has a very pleasant flavour of the nutmeg, and is often prescribed in quantities of half a drachm or a drachm, with the common saline draught; and in other cases, where delicacy rather than strength of flavour is required.

Spiritus Pimentæ. — *Spirit of Pimenta.*

℞ Pimentæ Baccarum contusarum uncias duas,
Spiritûs tenuioris congium,
Aquæ quod satis sit ad prohibendum empyreuma;

Take of Pimenta Berries bruised, two ounces,
Proof Spirit, a gallon,
Water, a sufficient quantity to prevent empyreuma;

Macera per horas viginti quatuor; tum lento igne destillet congius.

Macerate for twenty-four hours; then, with a slow fire, distil one gallon.

Spirit of pimenta is rendered useless by pimenta water; otherwise it is a pleasant aromatic for the purpose of covering nauseous flavours, especially those of rhubarb, and of the saline aperients, as in the following mixture:—

℞ Magnesiæ Sulphatis ℥j.
Infusi Rosæ compos. f ℥viss.
Spiritûs Pimentæ f ℥j.
Syrupi Zingiberis f ℥ss.
Fiat mistura, cujus sumatur cyathus pro re nata.

Spiritus Pulegii. — *Spirit of Pennyroyal.*

℞ Olei Pulegii *pondere* scrupulos septem,
Spiritûs rectificati octarios quatuor cum semisse;

Oleo Spiritum adjice, et tantum Aquæ affunde, ut post destillationem supersit quod satis sit ad prohibendum empyreuma; tum lento igne destillet congius.

Take of Oil of Pennyroyal, *by weight*, seven scruples,
Rectified Spirit, four pints and a half;

Add the Spirit to the Oil, and pour on them so much Water, that, after the distillation, a sufficient quantity may remain to prevent empyreuma; then, with the aid of a slow fire, let one gallon distil over.

In hysteric and uterine obstructions the old physicians thought much of pennyroyal, and in such cases the above spirit now and then makes its appearance in a prescription, but it is a very useless formula.

Spiritus Rosmarini. — *Spirit of Rosemary.*

℞ Olei Rosmarini *pondere* unciam,
Spiritûs rectificati congium;

Take of Oil of Rosemary *by weight*, an ounce,
Rectified Spirit, a gallon;

Oleo Spiritum adjice, et tantum Aquæ affunde, ut post destillationem supersit quod satis sit ad prohibendum empyreuma; tum lento igne destillet congius.

Add the Spirit to the Oil, and pour on them so much Water, that, after distillation, enough may remain to prevent empyreuma; then, with a slow fire, let one gallon be distilled.

The process of distillation is here manifestly superfluous. Spirit of rosemary is a pleasant perfume, and almost limited to external use, as an occasional addition to lotions and liniments. It is a leading ingredient in Hungary water, and in most of the compounds called vulnerary or arquebusade waters. *Hungary water*, as it is generally sold, is a mixture of the spirits of lavender and rosemary, but the following is the genuine recipe :—

Take of Fresh Rosemary in blossom, 4 pounds,
—— Sage ———— 8 ounces,
Ginger Root..... 2 ounces.
Cut, bruise, and pour upon them 12 pints of rectified spirit, and two pints of water. Distil, with a slow fire, 11 pints.

Eau de Cologne also contains oil of rosemary: there are several formulæ for it; among them the following :—

Take of Alcohol, 1 pint,
Oil of Bergamotte,
—— Orange-Peel,
—— Rosemary, of each 1 drachm,
Bruised Cardamom Seeds, 1 drachm,
Orange Flower Water, 1 pint.
Distil (from a water-bath), 1 pint.

TINCTURES.

Tinctures, with the exception of those few which contain very active ingredients, are not important pharmaceutical preparations; though they are extensively employed, they are by no means indispensable, and in hospitals and other situations where economy is an object, their place, as well as that of the spirits, may well be supplied by cheaper and more

simple formulæ. They consist of solutions of different substances in rectified spirit, either pure, or more or less diluted, proof spirit being employed in by far the greater number of instances. In the present Pharmacopœia they are all directed to be prepared at the common temperature of the atmosphere, and the usual time allowed for digesting the drug in the menstruum is fourteen days. At the end of that period the tinctures should be poured off, and pressed out of the residuary ingredients, and the whole filtered and put away for use. They are sometimes carelessly suffered to remain upon the dregs, portions being from time to time decanted off for use, so that at different times their strength varies; in respect to some of them, such want of uniformity may be productive of very serious consequences.

With few exceptions the tinctures are very permanent compounds, and, in well closed vessels, have no tendency to change their appearance or activity: a few of them are liable to unimportant alterations, and several deposit a portion of their contents when subjected to temperatures lower considerably than those at which they were originally prepared. In their preservation, therefore, uniformity of temperature should not be overlooked, and hence a cellar is the properest place in which to keep them in store.

The Pharmacopœia gives no other general directions respecting them than the following:—

Tincturæ omnes in vasis vitreis clausis præparari, et inter macerandum sæpiùs agitari, debent.	All Tinctures should be prepared in closed glass vessels, and often shaken whilst macerating.

But where they are made upon a very large scale, vessels of stoneware, and, in some cases, of tinned copper, may be substituted for those of glass.

Tinctura Alöes.	*Tincture of Aloes.*
℞ Alöes spicatæ Extracti contriti unciam dimidiam,	Take of Extract of spiked Aloe in powder, half an ounce,

Extracti Glycyrrhizæ unciam cum semisse,	Extract of Liquorice, an ounce and a half,
Aquæ octarium,	Water, a pint,
Spiritûs rectificati fluiduncias quatuor;	Rectified Spirit, four fluid ounces;
Macera per dies quatuordecim, et cola.	Macerate for fourteen days, and strain.

In this tincture, as in the compound decoction, extract of liquorice is added to cover the nauseous bitterness of the aloes, and it certainly renders it much less unpleasant. It may be given in the dose of from two to eight drachms, in conjunction, if necessary, with other alvine stimulants, or with aromatics; but, in most cases, the compound decoction will be found a preferable substitute.

Tinctura Alöes Composita.	*Compound Tincture of Aloes.*
℞ Alöes spicatæ Extracti contriti,	Take of Extract of spiked Aloe in powder,
Croci Stigmatum, singulorum uncias tres,	Saffron, of each three ounces,
Tincturæ Myrrhæ octarios duos;	Tincture of Myrrh, two pints;
Macera per dies quatuordecim, et cola.	Macerate for fourteen days, and strain.

This is a stronger, and at the same time a more nauseous, aloetic preparation than the former. It nearly corresponds in composition with the *elixir proprietatis* of old pharmacy; and the intention of maintaining the resemblance is probably the excuse for the retention of the large proportion of saffron, which was formerly considered efficacious. The old aloetic preparations, corresponding to the above, generally contained an acid as one of their ingredients. The prescription of Paracelsus contains sulphuric acid; that of Boerhaave, vinegar.

Compound tincture of aloes, in the dose of one or two drachms, is sometimes a convenient form of the drug: as an

emmenagogue, it may be conjoined with chalybeates, especially the tincture of muriate of iron; and may be prescribed in all those cases in which aloes is required, and which have been adverted to under the article "Aloes" in the Materia Medica.

Tinctura Assafœtidæ.

℞ Assafœtidæ uncias quatuor,
Spiritûs rectificati octarios duos;

Macera per dies quatuordecim, et cola.

Tincture of Assafœtida.

Take of Assafœtida, four ounces,
Rectified Spirit, two pints;

Macerate for fourteen days, and filter.

As an ingredient in prescriptions for anti-hysteric cases, tincture of assafœtida is occasionally ordered; it is, however, a very nauseous, though not inconvenient remedy. To the formulæ for the exhibition of assafœtida already given (page 38), the following may be added, as more condensed and portable than the above:—

℞ Tincturæ Assafœtidæ,
——— Gentianæ compos.
——— Valerianæ,
Spiritûs Ammoniæ Arom. āā f℥ss.
M. de qua sumatur cochleare unum minimum ex aquæ cyatho.

Tinctura Aurantii.

℞ Aurantii Corticis recentis uncias tres,
Spiritûs tenuioris octarios duos;

Macera per dies quatuordecim, et cola.

Tincture of Orange Peel.

Take of fresh Orange Peel, three ounces,
Proof Spirit, two pints;

Macerate for fourteen days, and filter.

When this tincture is prepared, as here directed, with fresh

orange peel, care should be taken to exclude the white or mucilaginous part of the fruit; it is, however, generally made with the dried peel, two ounces of which are equivalent to three of the fresh, and the resulting tincture is equally agreeable. It is an excellent stomachic adjunct; and, as it is not rendered turbid by water, is frequently added to infusions and other aqueous solutions.

Tinctura Benzöini Composita.

℞ Benzöini uncias tres,
Styracis Balsami colati uncias duas,
Balsami Tolutani unciam,
Aloës spicatæ Extracti unciam dimidiam,
Spiritûs rectificati octarios duos;

Macera per dies quatuordecim, et cola.

Compound Tincture of Benzoin.

Take of Benzoin, three ounces,
Storax Balsam strained, two ounces,
Balsam of Tolu, an ounce,
Extract of spiked Aloe, half an ounce,
Rectified Spirit, two pints;

Macerate for fourteen days, and strain.

Under the name of *Friar's Balsam*, a compound of this kind has long enjoyed a degree of repute as an healing application to wounds and sores: as such, it is not worth much, and is of no importance as an internal remedy.

Tinctura Calumbæ.

℞ Calumbæ concisæ uncias duas cum semisse,
Spiritûs tenuioris octarios duos;

Macera per dies quatuordecim, et cola.

Tincture of Calumba.

Take of Calumba sliced, two ounces and a half,
Proof Spirit, two pints;

Macerate for fourteen days, and filter.

This bitter tincture is a good stomachic stimulant in the dose of three or four drachms in a wine-glassful of water. As it is not blackened by solutions of iron, it is frequently pre-

scribed in conjunction with them: it is difficultly filtered, and very apt to lose its transparency on keeping.

Tinctura Camphoræ Composita.	*Compound Tincture of Camphor.*
℞ Camphoræ scrupulos duos, Opii duri contriti, Acidi Benzöici, singulorum drachmam, Spiritûs tenuioris octarios duos;	Take of Camphor, two scruples, Hard Opium, in powder, Benzoic Acid, of each a drachm, Proof Spirit, two pints;
Macera per dies quatuordecim, et cola.	Macerate for fourteen days, and strain.

The old and favourite *paregoric elixir* has degenerated, by the omission of a drachm of the oil of aniseed, into the above compound, which, in chronic asthma, and old obstinate coughs not rendered worse by slight stimulants, is an effective sedative, rather less than a grain of opium being contained in each half fluid ounce. It is a common, but not always harmless domestic remedy; a tea or dessert spoonful being taken at night in warm gruel or barley-water. Much was formerly thought of the pectoral powers of aniseed, and its flavour is so marked, that the old formula is very generally followed, and the preparation sold under the original name. It is the "*tinctura opii camphorata*" of former Pharmacopœiæ, a name, it is said, thought improper from its resemblance to that of tincture of opium. Paregoric elixir is often found in the nursery, especially for the cure of whooping cough, where its indiscriminate use cannot be too severely reprobated.

Tinctura Cantharidis.	*Tincture of Spanish Flies.*
℞ Cantharidis contusæ drachmas tres, Spiritûs tenuioris octarios duos;	Take of Spanish Flies bruised, three drachms, Proof Spirit, two pints;
Macera per dies quatuordecim, et cola.	Macerate for fourteen days, and filter.

After having some time possessed the title of "*Tinctura Lyttæ*," this has now returned to its ancient appellation. Speaking of cantharides as an article of the Materia Medica, we have reprobated their internal use. The above tincture is chiefly employed as an external stimulant and rubefacient, and with that intention is mixed with soap and camphor liniments. Mr. Thomson recommends a rag moistened with it as a useful application "in that peculiar species of mortification of the extremities which sometimes happens without any apparent cause; and to frost-bitten parts."

Tinctura Capsici.	*Tincture of Capsicum.*
℞ Capsici Baccarum unciam, Spiritûs tenuioris octarios duos; Macera per dies quatuordecim, et cola.	Take of Capsicum Berries, an ounce, Proof Spirit, two pints; Macerate for fourteen days, and filter.

The small capsicum berries should always be used in the preparation of this tincture, which furnishes a very convenient form of the remedy for gargles, and occasionally for internal administration. From ten drops to half a drachm may be prescribed as a dose; and from one to two drachms, with six ounces of barley-water, infusion of roses, or other proper vehicle, will generally afford a sufficiently-stimulating gargle, especially of the recently-prepared tincture; for it certainly loses acrimony by age.

Tinctura Cardamomi.	*Tincture of Cardamom.*
℞ Cardamomi Seminum contusorum uncias tres, Spiritûs tenuioris octarios duos; Macera per dies quatuordecim, et cola.	Take of Cardamom Seeds bruised, three ounces, Proof Spirit, two pints; Macerate for fourteen days, and filter.

A warm carminative tincture, properly added to aperients and bitters, with the view of rendering them comfortable to the stomach, in the usual dose of half a drachm or a drachm. A dessert-spoonful, in a little warm water, quiets the stomach after sea-sickness.

Tinctura Cardamomi Composita.	*Compound Tincture of Cardamom.*
℞ Cardamomi Seminum, Carui Seminum, Cocci, singulorum contritorum drachmas duas, Cinnamomi Corticis contusi unciam dimidiam, Uvarum passarum, demptis acinis, uncias quatuor, Spiritûs tenuioris octarios duos ; Macera per dies quatuordecim, et cola.	Take of Cardamom Seeds, Caraway Seeds, Cochineal, of each bruised, two drachms, Cinnamon Bark bruised, half an ounce, Raisins stoned, four ounces ; Proof Spirit, two pints ; Macerate for fourteen days, and filter.

The principal use of this tincture is as a colouring material, half a drachm, or a drachm, being conveniently added to colourless compounds ; and where long perseverance in any course of medicine is necessary, it is often required to make some such slight change in its aspect. It is, however, also a pleasant stomachic, and as such, the raisins give it an agreeable sweetness and flavour : but for all its ordinary medicinal applications, the tincture is preferable without them.

Tinctura Cascarillæ.	*Tincture of Cascarilla.*
℞ Cascarillæ Corticis contriti uncias quatuor, Spiritûs tenuioris octarios duos ; Macera per dies quatuordecim, et cola.	Take of Cascarilla Bark in powder, four ounces, Proof Spirit, two pints ; Macerate for fourteen days, and filter.

This is a needless tincture. The flavour and aroma of cascarilla are not such as to render it a desirable adjunct on those accounts; and the virtues of the drug are overcome by those of the spirit, so that it is by no means a desirable form.

Tinctura Castorei.	*Tincture of Castor.*
℞ Castorei contriti uncias duas, Spiritûs rectificati octarios duos; Macera per dies septem, et cola.	Take of Castor in powder, two ounces, Rectified Spirit, two pints; Macerate for seven days, and filter.

The reader is referred to page 54 for the properties and uses of the supposed active principle of this tincture. Notwithstanding the high encomiums formerly bestowed upon castor as a nervine restorative, confidence is now rarely placed in it; and if it finds its way into a prescription, it is rather on account of custom and ancient reputation, than for any services which it is expected to perform. It is usual to conjoin it with remedies of indisputable activity.

Tinctura Catechu.	*Tincture of Catechu.*
℞ Catechu Extracti uncias tres, Cinnamomi Corticis contusi uncias duas, Spiritûs tenuioris octarios duos; Macera per dies quatuordecim, et cola.	Take of Extract of Catechu, three ounces, Cinnamon Bark bruised, two ounces, Proof Spirit, two pints; Macerate for fourteen days, and strain.

A very useful and unobjectionable astringent tincture, rendered more grateful, and, in many of its applications, more effective, by the addition of cinnamon. In diarrhœa

it is usually prescribed, as at page 55, with chalk mixture: in habitual laxity of the bowels, one or two drachms may be taken twice a day, with some bitter infusion, or in port wine, and it often proves a kindly acting tonic and restorative.

Tinctura Cinchonæ. — *Tincture of Cinchona.*

℞ Cinchonæ lancifoliæ Corticis contriti uncias septem,
Spiritûs tenuioris octarios duos;
Macera per dies quatuordecim, et cola.

Take of lance-leaved Cinchona Bark in powder, seven ounces,
Proof Spirit, two pints;
Macerate for fourteen days, and filter.

The properties of cinchona, and its medicinal uses, have been so fully discussed under that head, in the Materia Medica, that no further remarks are here suggested, excepting that the above simple tincture, in consequence of the nature of the menstruum, is an inefficient preparation of bark, though a proper and useful addition to more active formulæ containing the same remedy. With this intention a drachm or two is prescribed with an ounce and a half of the decoction, or may be added to the formulæ at page 63.

Tinctura Cinchonæ Ammoniata. — *Ammoniated Tincture of Cinchona.*

℞ Cinchonæ lancifoliæ Corticis contriti uncias quatuor,
Spiritûs Ammoniæ aromatici octarios duos;
Macera per dies decem, et cola.

Take of lance-leaved Cinchona Bark in powder, four ounces,
Aromatic Spirit of Ammonia, two pints;
Macerate for ten days, and filter.

This was never either a plausible or useful formula, and the recent discoveries respecting the nature of the active principle of cinchona, prove it highly objectionable; for the solvent is

well calculated to abstract everything except the cinchonia. Ammonia and bark are often properly conjoined; but in that case the alkali should be added to some of the other active preparations, and not employed as in the above tincture.

Tinctura Cinchonæ Composita. — *Compound Tincture of Cinchona.*

℞ Cinchonæ lancifoliæ Corticis contriti uncias duas,	Take of lance-leaved Cinchona Bark in powder, two ounces,
Aurantii Corticis exsiccati unciam cum semisse,	Orange Peel dried, an ounce and a half,
Serpentariæ Radicis contusæ drachmas tres,	Virginia Snake-root bruised, three drachms,
Croci Stigmatum drachmam,	Saffron, a drachm,
Cocci contriti scrupulos duos,	Cochineal in powder, two scruples,
Spiritûs tenuioris fluiduncias viginti;	Proof Spirit, twenty fluid ounces;
Macera per dies quatuordecim, et cola.	Macerate for fourteen days, and filter.

No preparation of bark has attained more celebrity than the above, under the title of "*Huxham's Tincture of Bark;*" it is a good stomachic, but a very inefficient preparation of cinchona, and is chiefly employed as a cordial addition to other formulæ, and as a source of colour, which it derives from the otherwise inactive saffron and cochineal.

Tinctura Cinnamomi. — *Tincture of Cinnamon.*

℞ Cinnamomi Corticis contusi uncias tres,	Take of Cinnamon Bark bruised, three ounces,
Spiritûs tenuioris octarios duos;	Proof Spirit, two pints;
Macera per dies quatuordecim, et cola.	Macerate for fourteen days, and strain.

This warm, and, at the same time, astringent tincture, is a valuable adjunct to a variety of tonics and absorbents; it is also a good accompaniment to acids when prescribed in cases of atony of the stomach. It is not rendered turbid by the addition of dilute sulphuric acid, as in the following :—

℞ Acidi Sulphurici diluti f℥ss.
Tinctura Cinnamomi f℥jss. M.
Sit dosis cochleare unum minimum bis die ex aquæ frigidæ cyatho.

Tinctura Cinnamomi Composita.	*Compound Tincture of Cinnamon.*
℞ Cinnamomi Corticis contusi drachmas sex,	Take of Cinnamon Bark bruised, six drachms,
Cardamomi Seminum contusorum drachmas tres,	Cardamom Seeds bruised, three drachms,
Piperis longi Fructûs contriti,	Long Pepper, in powder,
Zingiberis Radicis concisæ, singulorum drachmas duas,	Ginger Root, sliced, of each two drachms,
Spiritûs tenuioris octarios duos;	Proof Spirit, two pints;
Macera per dies quatuordecim, et cola.	Macerate for fourteen days, and filter.

The cinnamon is but a secondary ingredient in this tincture, which is very rarely prescribed, and might have been rejected; for though it is a powerful and pleasant combination of spices, it is not wanted in practice. The once celebrated "*elixir vitrioli acidum*" consisted of three parts of the above tincture, and one part of sulphuric acid.

Tinctura Digitalis.	*Tincture of Foxglove.*
℞ Digitalis Foliorum exsiccatorum uncias quatuor,	Take of Foxglove Leaves dried, four ounces,

Spiritûs tenuioris octarios duos;	Proof Spirit, two pints;
Macera per dies quatuordecim, et cola.	Macerate for fourteen days, and filter.

The precautions requisite in the preparation and exhibition of this important tincture, together with its dose and effects, have been detailed under the article "Digitalis," in the list of the Materia Medica. It should not be exhibited with substances likely to combine with or modify its active principle, which, according to M. Royer *, corresponds in its generic characters with the other vegetable salifiable bases. Tincture of digitalis is not rendered turbid by water, nor by the greater number of the simple infusions; and it may be given without impropriety in a saline draught, or with camphor or almond mixture; but the free acids should be avoided till the chemical characters of *digitalia* are better known.

Tinctura Gentianæ Composita.	*Compound Tincture of Gentian.*
R Gentianæ Radicis concisæ uncias duas,	Take of Gentian Root sliced, two ounces,
Aurantii Corticis exsiccati unciam,	Orange Peel dried, an ounce,
Cardamomi Seminum contusorum unciam dimidiam,	Cardamom Seeds bruised, half an ounce,
Spiritûs tenuioris octarios duos;	Proof Spirit, two pints;
Macera per dies quatuordecim, et cola.	Macerate for fourteen days, and filter.

We have already had frequent opportunities of adverting to the uses of this tincture (see pages 90, 216, 230, &c.): it

* Quarterly Journal, vol. xviii. p. 178, and Bibliothèque Universelle, tom. xxvi., p. 102.

is a powerful, yet grateful bitter, and particularly well adapted as an adjunct to acids.

Tinctura Guaiaci.	*Tincture of Guaiacum.*
℞ Guaiaci Gummi-resinæ contritæ libram dimidiam, Spiritûs rectificati octarios duos;	Take of Guaiacum Gum-resin in powder, half a pound, Rectified Spirit, two pints;
Macera per dies quatuordecim, et cola.	Macerate for fourteen days, and filter.

This is not a useful form of guaiacum, for where it is admissible, the powder is generally to be preferred. Like the succeeding tincture, it is given in the dose of one or two drachms, rubbed down with mucilaginous substances, otherwise the resin separates in a curdy form.

Tinctura Guaiaca Ammoniata.	*Ammoniated Tincture of Guaiacum.*
℞ Guaiaci Gummi-resinæ contritæ uncias quatuor, Spiritûs Ammoniæ aromatici octarium cum semisse;	Take of Guaiacum Gum-resin in powder, four ounces, Aromatic Spirit of Ammonia, a pint and a half;
Macera per dies quatuordecim, et cola.	Macerate for fourteen days, and strain.

In rheumatism, as in the formula at page 92, this tincture is frequently resorted to; it is nauseous, and pleasant to few stomachs, but has certainly proved a useful form of guaiacum in chronic rheumatic affections. The dose is from one to two drachms, properly blended with water by the aid of mucilage, honey, or yolk of egg, and conjoined with diaphoretics and a corresponding regimen. In such cases, it is frequently administered in conjunction with cinchona.

℞ Tincturæ Guaiaci Ammon. f 3j.
Vitelli Ovi quantum sufficit,
Syrupi Zingiberis f 3j.
Decocti Cinchonæ f 3xiv.
Fiat haustus, ter vel quater in die sumendus.

Tinctura Hellebori Nigri.

℞ Hellebori nigri Radicis concisæ uncias quatuor,
Spiritûs tenuioris octarios duos;

Macera per dies quatuordecim, et cola.

Tincture of Black Hellebore.

Take of Black Hellebore Root sliced (*bruised*), four ounces,
Proof Spirit, two pints;

Macerate for fourteen days, and filter.

An ineligible form of a drug which should be rejected from the Materia Medica. It is said to have been recommended by Dr. Mead in uterine obstructions, as a powerful emmenagogue; a quality referrible to its drastic cathartic powers, which it often exerts very capriciously, and for which many unobjectionable substitutes may be found. From twenty to sixty minims is a dose. It has also been prescribed in gout, a disease in which drastic purges, merely considered as such, and without reference to any other specific action of the remedy, are sometimes, though rarely, useful.

Tinctura Humuli.

℞ Humuli Strobilorum uncias quinque,
Spiritûs tenuioris octarios duos;

Macera per dies quatuordecim, et cola.

Tincture of Hops.

Take of Hops, five ounces,
Proof Spirit, two pints;

Macerate for fourteen days, and filter.

A tincture of no use or efficacy, except as a mild bitter; but if such a preparation is to be retained in the Pharmacopœia,

rectified, and not proof spirit, should be used for it, and the hops should be cut and bruised.

Tinctura Hyoscyami. — *Tincture of Henbane.*

℞ Hyoscyami Foliorum exsiccatorum uncias quatuor,	Take of Henbane Leaves dried, four ounces,
Spiritûs tenuioris octarios duos;	Proof Spirit, two pints;
Macera per dies quatuordecim, et cola.	Macerate for fourteen days, and filter.

Henbane, in this form, is not to be depended upon; yet the tincture, carefully prepared from well-dried leaves, is by no means inactive as a sedative. One drachm may be administered at bedtime, in a saline draught; but a solution of an equivalent quantity of the extract is more certain.

Tinctura Jalapæ. — *Tincture of Jalap.*

℞ Jalapæ Radicis contritæ uncias octo,	Take of Jalap Root in powder, eight ounces,
Spiritûs tenuioris octarios duos;	Proof Spirit, two pints;
Macera per dies quatuordecim, et cola.	Macerate for fourteen days, and filter.

One or two drachms of this tincture, which contains all the active matter of jalap, are often added to purgative combinations, for the purpose of augmenting their energy: the objection to the addition is, that it is apt to gripe.

Tinctura Kino. — *Tincture of Kino.*

℞ Kino contriti uncias tres,	Take of Kino in powder, three ounces,
Spiritûs rectificati octarios duos;	Rectified Spirit, two pints;
Macera per dies quatuordecim, et cola.	Macerate for fourteen days, and strain.

Tincture of catechu may always be substituted for the above, which is, moreover, objectionable in consequence of the solution frequently gelatinising.

Tinctura Myrrhæ.

℞ Myrrhæ contusæ uncias quatuor,
Spiritûs rectificati octarios tres;

Macera per dies quatuordecim, et cola.

Tincture of Myrrh.

Take of Myrrh bruised, four ounces,
Rectified Spirit, three pints;

Macerate for fourteen days, and strain.

The tinctures of myrrh formerly made with proof spirit were never clear: the above tincture is transparent, and contains the resinous and odorous parts of the drug. It seldom forms an article of prescriptions for internal use, one of which, however, we have given above. It is principally employed in gargles and mouth-washes, and as a stimulating application to old ulcers.

Tinctura Opii.

℞ Opii duri contriti uncias duas cum semisse,
Spiritûs tenuioris octarios duos;

Macera per dies quatuordecim, et cola.

Tincture of Opium.

Take of hard Opium in powder, two ounces and a half,
Proof Spirit, two pints;

Macerate for fourteen days, and filter.

Much that might be said of this important and almost indispensable tincture, has already been anticipated under the head of "Opium." About two-thirds of the opium are dissolved in the above process; and twenty minims of the tincture contain about one grain of solid matter. The whole of the morphia of the above quantity of opium is not extracted in the process, for it is found in no inconsiderable proportion in the matter which remains upon the filter.

This tincture is an extremely convenient preparation of opium, either where a large dose is required, in its most active state, or where it is necessary to administer it in very small and divided portions. It may be given in almost any vehicle, but it is as well to avoid combining it directly with the alkalies and their carbonates, and with the greater number of metallic salts, by which the morphia is either precipitated or enters into new combinations. The acids, as usually employed in medicine, are perfectly compatible with it; and tinctures of opium, prepared with vegetable acids, have sometimes been preferred to other formulæ. Among these, the acetic tincture of opium, and acetate of morphia, have been supposed to act as sedatives less stimulant than opium itself; and the celebrated *black drop* is probably a compound of this kind*. These modifications of opium, however, are rather calculated to lead to uncertainties in practice, than to any direct advantage in the treatment of disease; for unbiassed observation and experience has not justified the opinion often entertained respecting their peculiar powers.

Tincture of opium is often used as an external anodyne application.

Tinctura Rhei.	*Tincture of Rhubarb.*
℞ Rhei Radicis concisæ uncias duas,	Take of Rhubarb Root sliced, two ounces,
Cardamomi Seminum contusorum unciam dimidiam,	Cardamom Seeds bruised, half an ounce,
Croci Stigmatum drachmas duas,	Saffron, two drachms,
Spiritûs tenuioris octarios duos;	Proof Spirit, two pints;
Macera per dies quatuordecim, et cola.	Macerate for fourteen days, and filter.

The cardamom seeds are a warm and proper accompaniment to the rhubarb, but the saffron is in every way useless. In doses of one or two drachms, the above tincture is a good stomachic, conjoined with bitters and aromatics; and half an

* See Dr. Paris's Pharmacologia, article *Opium*.

ounce, in an ounce of peppermint-water, is a warm but gentle aperient, useful in flatulency with a tendency to diarrhœa.—(See *Rhei Radix*, in the list of the Materia Medica.)

Tinctura Rhei Composita. — *Compound Tincture of Rhubarb.*

℞ Rhei Radicis concisæ uncias duas,
Glycyrrhizæ Radicis contusæ unciam dimidiam,
Zingiberis Radicis concisæ,
Croci Stigmatum, singulorum drachmas duas,
Spiritûs tenuioris octarium,
Aquæ fluiduncias duodecim;
Macera per dies quatuordecim, et cola.

Take of Rhubarb Root sliced, two ounces,
Liquorice Root bruised, half an ounce,
Ginger Root sliced,
Saffron, of each two drachms.
Proof Spirit, a pint,
Water, twelve fluid ounces;
Macerate for fourteen days, and filter.

One or other of these tinctures of rhubarb should have been omitted, though the weakness of the above may sometimes recommend it. Perhaps *Bates's Tincture of Rhubarb* might have been substituted, aniseed being grateful to some palates, and effectually covering the nauseous flavour of the rhubarb: it is prepared as follows:—

℞ Radicis Rhei concis.
——— Glycyrrhizæ concis. āā ℥ij.
Seminum Anisi contus.
Sacchari purif. āā ℥j.
Spiritûs tenuioris octarios ij.
Macera per dies quatuordecim, et cola.

Tinctura Scillæ. — *Tincture of Squills.*

℞ Scillæ Radicis recens exsiccatæ uncias quatuor,
Spiritûs tenuioris octarios duos;
Macera per dies quatuordecim, et cola.

Take of Squill Root recently dried, four ounces,
Proof Spirit two pints;
Macerate for fourteen days, and filter.

The uses and dose of this tincture have been already mentioned (page 157): about thirty minims are equivalent to a grain of squills. Conjoined with demulcents, it is a good remedy in troublesome tickling coughs, where there is no decided inflammatory tendency, as in this formula:—

℞ Misturæ Amygdalæ f℥jss.
Potassæ Nitratis gr. x.
Syrupi Papaveris f℥j.
Tincturæ Scillæ ♏xx.
Fiat haustus horâ decubitûs sumendus, et repetetur bis die sine syrupo papaveris.

An obstinate hoarseness of long duration sometimes yields to thirty drops of tincture of squills, taken night and morning, in a wine-glassful of water.

Tinctura Sennæ.	*Tincture of Senna.*
℞ Sennæ Foliorum uncias tres,	Take of Senna Leaves, three ounces,
Carui Seminum contusorum drachmas tres,	Carraway Seeds bruised, three drachms,
Cardamomi Seminum contusorum drachmam,	Cardamom Seeds, bruised, a drachm,
Uvarum passarum, demptis acinis, uncias quatuor,	Raisins stoned, four ounces,
Spiritûs tenuioris octarios duos;	Proof Spirit, two pints;
Macera per dies quatuordecim, et cola.	Macerate for fourteen days, and strain.

Liquorice is a good substitute for the raisins in this formula. The principal use of the tincture is as an adjunct to purging remedies, in the dose of a drachm or two. Half an ounce or an ounce of it, with peppermint or mint water, is a good warm purge for gouty habits. Like the infusion, and other forms of senna, it is apt to nauseate considerably immediately previous to the commencement of its action upon the bowels. Senna is said to be the active ingredient in

Daffy's elixir, but we have reason to suspect opium in some of the nostrums sold under that name. *Gout cordial* is a mixture of the compound tinctures of rhubarb and of senna.

Tinctura Serpentariæ. — *Tincture of Virginian Snake-root.*

℞ Serpentariæ Radicis uncias tres,
Spiritûs tenuioris octarios duos;
Macera per dies quatuordecim, et cola.

Take of Virginian Snake-root, three ounces,
Proof Spirit, two pints;
Macerate for fourteen days, and strain.

The character of the base of this tincture is given in the Materia Medica. The tincture itself is nearly useless. It may be given in the dose of one or two drachms, with an ounce and a half of decoction of bark.

Tinctura Valerianæ. — *Tincture of Valerian.*

℞ Valerianæ Radicis uncias quatuor,
Spiritûs tenuioris octarios duos;
Macera per dies quatuordecim, et cola.

Take of Valerian Root, four ounces,
Proof Spirit, two pints;
Macerate for fourteen days, and filter.

This, if not a very effective form of valerian, is at least useful in communicating its odour, as an anti-hysteric and nervine remedy. A drachm of it is added, with this intention, to the usual anti-nervous formulæ, and these are rendered perfect by the further addition of twenty drops of tincture of assafœtida. It is not an improper addition to decoction of bark, when given in nervous habits of body.

Tinctura Valerianæ Ammoniata.	*Ammoniated Tincture of Valerian.*
℞ Valerianæ Radicis uncias quatuor, Spiritûs Ammoniæ aromatici octarios duos; Macera per dies quatuordecim, et cola.	Take of Valerian Root, four ounces, Aromatic Spirit of Ammonia, two pints; Macerate for fourteen days, and strain.

This is a stronger tincture than the preceding, more of the active matter of the root being dissolved by the aromatic spirit of ammonia, than by the proof spirit: the dose is the same. It is generally given with camphor mixture, æthereals, or weak decoction or infusion of valerian, as in the formula at page 185.

Tinctura Zingiberis.	*Tincture of Ginger.*
℞ Zingiberis Radicis concisæ uncias duas, Spiritûs rectificati octarios duos; Macera per dies quatuordecim, et cola.	Take of Ginger Root sliced, two ounces, Rectified Spirit, two pints; Macerate for fourteen days, and filter.

The abundance of mucilaginous matter in ginger rendered the tinctures made with proof spirit turbid; rectified spirit is now properly substituted, which, without acting upon the mucilage, takes up the whole of the acrimony and flavour of the root, and furnishes an elegant and useful stomachic tincture, applicable as an adjunct or corrigent to griping purgatives, and pleasant to debilitated and flatulent habits. The dose is from half a drachm to two drachms, but it would have been a more useful tincture if double the above quantity of ginger had been used.

PREPARATIONS OF ÆTHER.

When equal weights of alcohol and sulphuric acid are carefully mixed and subjected to distillation, as afterwards

described, a portion of the alcohol is converted into an extremely light fragrant fluid, termed *sulphuric æther*, which in its utmost state of purity has the following properties. It is transparent and colourless, of a very pungent taste, highly intoxicating, and so volatile, that when poured from one vessel into another, a considerable portion evaporates: when dropped upon surfaces, it produces intense cold as it passes into vapour; and when thus suffered to trickle over the bulb of a thermometer, the mercury soon falls below the freezing point of water. It is said to have been procured of a specific gravity as low as .632: I have never obtained it lower than .700, and that which is met with in the shops is rarely less than .730, and often more than .740. It freezes at — 46. At mean temperature and pressure, and of the specific gravity .730, it boils at 98°, and is converted into highly inflammable vapour, the specific gravity of which, compared with that of air, is as 2.586 to 1.000. It dissolves the resins, fixed and volatile oils, sulphur, phosphorus, and ammonia, but it does not dissolve either potassa or soda, or their carbonates. One part of æther requires about ten of water for its solution: it dissolves in alcohol in all proportions. Its vapour is so inflammable, that the utmost caution is requisite in approaching it with a lighted candle. When burnt, it yields the same products as alcohol, but in different proportions. The results of its combustion have been minutely examined by several chemists of eminence, especially by Saussure, whose analysis of alcohol has already been quoted, and by Dr. Ure: they have given its ultimate elements as follows:—

Carbon	67.98	60.00
Oxygen	17.62	26.66
Hydrogen	14.40	13.34
	100	100
	—— (*Saussure.*)	—— (*Ure.*)

Saussure's æther was of the specific gravity of .715, at 68° Fahrenheit, and that employed by Dr. Ure only .700.

On comparing these analytical results, especially Dr. Ure's, with the theory of volumes, as adopted by Gay Lussac, they

will be found nearly to agree with the supposition that æther is constituted of two volumes of carburetted hydrogen, and one volume of aqueous vapour, the *three* volumes being condensed into *one* by combination; for, assuming the specific gravity of carburetted hydrogen as .978, and that of aqueous vapour as .625 (atmospheric air being =1.000), we find that—

2 volumes of Carburetted Hydrogen	$978 \times 2 = 1.956$
1 ——— Vapour of Water	$= 0.625$
Condensed into *one* volume of Vapour of Æther ...	$= 2.581$

and the specific gravity of the vapour of æther, as determined by experiment, is =2.586.

Two volumes of carburetted hydrogen, and *one volume* of the vapour of water, are equivalent, *by weight*, to—

4 proportionals of Carburetted Hydrogen	$7 \times 4 = 28$
1 ——— Water.....	$= 9$
	37

and upon this view of the subject, the theoretical composition of æther may be stated as follows:—

4 proportionals of Carbon.....	$6 \times 4 = 28$
1 ——— Oxygen (in the Water).....	$= 8$
5 ——— Hydrogen (4 in the Carburetted Hydrogen and 1 in the Water	$= 5$
	37

or *per cent.*, as compared with Dr. Ure's experimental result—

Carbon	64.9	.....	60.00
Oxygen	21.6	.....	26.66
Hydrogen	13.5	.....	13.34
	100		100
	(*Theory.*)		(*Experiment.*)

It appears, therefore, that the action of the sulphuric acid upon alcohol, by which the latter is converted into æther, consists essentially in the abstraction of one-half of its elementary

water *, for the vapour of alcohol consists of *equal volumes* of carburetted hydrogen and aqueous vapour, condensed into one-half their united bulk, or of *two* proportionals of carburetted hydrogen $(7 \times 2) = 14$, and *one* of water $= 9$; whereas, the vapour of æther is composed of *two volumes* of the former and *one* of the latter, condensed into one volume; or *four* proportionals of carburetted hydrogen $(7 \times 4) = 28$, and *one* of water $= 9$, as shewn in the following comparative diagrams:—

23 parts of Alcohol (by weight) consist of

2 proportionals of Carburetted Hydrogen $7 \times 2 = 14$.	1 proportional of Aqueous Vapour $= 9$.

$14 + 9 = 23$.

37 parts of Æther (by weight) consist of

4 proportionals of Carburetted Hydrogen. $7 \times 4 = 28$.	1 proportional of Aqueous Vapour $= 9$.

$28 + 9 = 37$.

Resulting volume of the Vapour of Alcohol.

Resulting volume of the Vapour of Æther.

Æther Sulphuricus.

℞ Spiritûs rectificati,
Acidi Sulphurici, singulorum *pondere* libram cum semisse;

Sulphuric Æther.

Take of Rectified Spirit,
Sulphuric Acid, of each, *by weight*, a pound and a half;

* A curious corroboration of this view of the process, is derived from the action of fluoboric gas upon alcohol, which, strongly attracting the elements of water, abstracts them from that fluid, and affords a product having the characters of sulphuric æther.

Spiritum retortæ vitreæ infunde, eique Acidum paulatim adjice, sæpiùs agitans, et cavens ne gradum 120mum calor excedat, donec misceantur. Dein in arenam, ad gradum 200mum priùs calefactam, cautè impone, ut quàm celerrimè ebulliat liquor, transeatque Æther in receptaculum tubulatum, cui aptatum sit vas recipiens glacie vel aquâ refrigeratum. Destillet liquor, donec pars aliqua gravior transire incipiat, quæ sub Æthere in fundo receptaculi conspiciatur. Liquori qui restat in retorta rursus Spiritûs rectificati uncias duodecim affunde, ut simili modo destillet Æther.

Pour the Spirit into a glass retort, and gradually add the Acid to it, shaking them frequently, and taking care that the temperature does not exceed 120°, till they are mixed. Then place the retort very cautiously in sand, previously heated to 200°, that the liquor may boil as soon as possible, and the Æther pass over into a tubulated receiver, to which a recipient is adapted, kept cold by ice or water. Let the liquor distil until another heavier part begins to pass over, which may be seen under the Æther at the bottom of the receiver. To the liquor which remains in the retort again add twelve ounces of rectified Spirit, that Æther may again be distilled as before.

Æther Rectificatus.

℞ Ætheris sulphurici fluiduncias quatuordecim,
Potassæ fusæ unciam dimidiam,
Aquæ destillatæ fluiduncias undecim;

Potassam in Aquæ fluidunciis duabus primùm liqua, eique Ætherem adjice, assiduè agitans, donec misceantur; tum, calore gradûs circiter 120mi, ex retorta ampla destillent in vas refrigeratum Ætheris fluidunciæ duodecim; destillatum cum Aquæ fluidunciis novem simul agita, et sepone ut subsidat Aqua. Denique Ætherem rectificatum supernatantem effunde, et vase bene obturato serva.

Rectified Æther.

Take of Sulphuric Æther, fourteen fluid ounces,
Fused Potassa, half an ounce,
Distilled Water, eleven fluid ounces;

First dissolve the Potassa in two fluid ounces of the Water, and add the Æther, shaking them thoroughly until they are mixed; then, at a temperature of about 120°, let twelve fluid ounces of Æther distil over from a large retort into a cooled vessel, then shake the distilled fluid with nine fluid ounces of Water, and set it by, that the Water may subside. Lastly, pour off the supernatant rectified Æther, and keep it in a well-stopped vessel.

The above formulæ are very inconveniently and unnecessarily separated in the Pharmacopœia, so that the apothecary is obliged to keep both "sulphuric æther" and "rectified æther," the former being a sulphurous mixture of æther, alcohol, and water, probably never intended to be pre-

scribed, and certainly quite unfit for medicinal use; but, in chemical language, sulphuric æther and rectified æther are synonymous, and if the physician prescribes the former instead of the latter, a mistake which frequently happens, it is probable that the patient may get the heterogeneous compound just adverted to, instead of the pure æther which was intended.

With a view of preventing repetition, we have already traced out the theory of ætherification, and described the leading properties of the product in its pure state. The process of its distillation, though conveniently performed upon a small scale, in a glass retort, is usually conducted in a still with a worm-pipe and refrigeratory upon the usual construction, where large quantities of the product are required. If great care be taken to stop the process at a proper period, a copper still may be used, but one of lead is preferable; and as considerable risk is incurred by fire, high-pressure steam is not only very conveniently, but often very economically applied as the source of the required heat.

If we attempt to distil æther by steam at the temperature of 212°, or even 220°, very little else than alcohol passes over. A temperature of from 250° to 280° is required for the purpose, so that the pressure under which the steam is generated must at least amount to that of one additional atmosphere.

In the apparatus employed for this purpose at Apothecaries' Hall, the still is of cast iron, lined with lead; the steam is conducted through the mixture of acid and alcohol by a contorted leaden pipe at the bottom of the still, and is supplied by a boiler calculated to resist a pressure of 100 lbs. on the square inch: in this way the mixture is very rapidly raised to its boiling point, a larger relative quantity of æther is obtained than when an open fire is used, and all risk incurred by the latter is effectually avoided, the boiler being in a distinct apartment. The condensing apparatus and refrigeratory are of the usual construction, but abundantly supplied with cold water.

In the above process a portion of alcohol first passes over; to this succeeds æther; then water makes its appearance, and the odour of sulphurous acid is evident, at which time the ingredients of the retort blacken, and have a tendency to

boil over. The "heavier fluid," mentioned in the formula, is the aqueous solution of sulphurous acid, and as soon as it appears the process should be stopped, either by removing the receiver and withdrawing the fire; or, more conveniently and immediately, by turning off the steam. In repeating the process with the addition of fresh alcohol, a second production of æther ensues, but a much larger relative quantity of unaltered alcohol passes over than in the first operation. The principal change which the sulphuric acid suffers in the first instance is dilution by water, partly abstracted from the alcohol and partly produced; when the carbonaceous matter acts upon the acid, a portion is decomposed, and sulphurous and carbonic acids are formed, some carburetted hydrogen is also evolved, and small quantities of a fragrant oily matter. In the ultimate residue, MM. Sertuerner* and Vogel† have announced the presence of a peculiar compound, called by the former the *œnothionic*, and by the latter *sulphovinous* acid: the residuary carbon is also in a very peculiar state.

Mr. Phillips‡ states that in preparing *æther sulphuricus*, he obtained from the proportions directed in the Pharmacopœia twelve fluid ounces of product, of which six drachms were the *heavier fluid* mentioned, and eleven fluid ounces and a quarter *æther sulphuricus*, of the specific gravity 0.768. On adding the second portion of spirit the quantity of product was nearly similar, but its specific gravity was 0.807, shewing that the power of the acid to produce æther was much diminished by the first operation. Conducting the process upon a large scale at Apothecaries' Hall, the results are somewhat different. One hundred pounds of sulphuric acid and one hundred pounds of alcohol afford about fifty-two pounds of æther of the specific gravity .761. Fifty pounds of rectified spirit are then added to the residue in the still, and upon the second distillation from forty-six to fifty pounds of product are drawn over, of the specific gravity .765. About one hundred pounds of impure æther are thus obtained, which, by purification, afford from fifty-five to fifty-eight

* Thomson's Annals of Philosophy, vol. xiv. p. 44.

† Annales de Chimie et Physique, tom. xiii. p. 62.

‡ Trans. Pharmacop. p. 224.

pounds of *rectified æther* of the specific gravity .733, which is as low as it is usually sold for pharmaceutical purposes; though it is somewhat remarkable that the Pharmacopœia contains no directions respecting its specific gravity.

The purification of æther is very well effected by following the directions above given, but they are not those generally adopted, the common method being to add subcarbonate of potassa to the impure æther, and subject the mixture to distillation, as long as æther of a sufficiently low specific gravity passes over. Perfectly pure æther is not desirable for medicinal uses.

Considered in relation to its medicinal uses, sulphuric æther is a very powerful and diffusible, but at the same time a transient stimulus, acting upon the brain nearly in the same way as alcohol, and therefore, to a certain extent, narcotic. In many instances it also proves decidedly antispasmodic; it is, however, not very frequently administered, except in combination with alcohol, as in the spirit, and compound spirit of æther, afterwards to be mentioned.

A tea-spoonful or more of undiluted æther has been successfully given in the cure of intermittent fever, immediately previous to the accession of the cold fit: it occasions a powerful shock to the system, momentarily taking away the breath, and giving great anxiety and uneasiness for a few seconds; but the febrile paroxysm is not unfrequently checked in its progress, and the disease has sometimes altogether disappeared; the practice however is by no means commendable. Hysterical fits, and even epilepsy, are said to have been successfully treated in the same way. In nervous fever particular symptoms are often relieved by æther, and in a variety of spasmodic diseases it is advantageously employed, especially in cramp and tetanic affections, and in the paroxysm of spasmodic asthma; in the latter case, and in catarrhal dyspnœa, the inhalation of the vapour of æther has been recommended; but the practice is not always safe, especially where determination of blood to the head is to be apprehended.

The usual dose of æther is from twenty minims to two fluid drachms, and it is usually prescribed in conjunction with other antispasmodics, especially camphor. The following is a very effectual form, applicable in any case of violent spasm;

as the effect of æther is but transient, the dose should be repeated every hour, or every two or three hours, according to the effect produced, and to the severity of the symptoms.

℞ Ætheris Rectificati f℥ss.
Misturæ Camphoræ fort. f℥vij.
Syrupi Croci f℥ss.
Fiat mistura, cujus sit dosis cochlearia tria ampla.

In the disease commonly called nervous headach, unattended by vascular fulness and allied to general debility of the nervous system, the following has proved effective :—

℞ Ætheris Rectificati,
Liquoris Ammoniæ, ♏ f3ss
Misturæ Camphoræ f3x.
Tinct. Cardam. comp. f3j.
Misce pro haustu bis vel ter die sumendo.

A small tea-spoonful of æther in a glass of white wine is often a most effectual remedy in allaying the most distressing symptoms of sea-sickness, and in restoring the tone of the stomach after it.

Æther is applied externally as a refrigerant and stimulant; it produces the former effects by the facility and rapidity with which it evaporates. A little poured into the hand and held near the eye stimulates that organ, and is supposed to be useful in incipient corneal opacity. In all these applications of æther, great care should be taken to avoid the proximity of fire.

Oleum Æthereum. — *Æthereal Oil.*

Post destillationem Ætheris sulphurici, lenito calore, destillet iterum liquor, donec spuma nigra intumescat; tum protinùs ab igne retortam remove. Liquori qui restat in retorta Aquam adjice, ut supernatet pars oleosa. Hanc aufer, eique admisce Liquoris Calcis quantum satis sit, ad

After the distillation of sulphuric Æther, having lowered the heat, again distil the liquor till a black froth swells up; then instantly remove the retort from the fire. Add Water to the liquor remaining in the retort, so that the oily part may float upon the surface. Remove this, and add to it a sufficient

acidum, quod inest, saturandum, et simul agita. Denique Oleum æthereum separatum exime.

quantity of lime-water to saturate the acid which it contains, and shake them together. Lastly, remove the separated æthereal oil.

In this way a very small portion of very impure æthereal oil is obtained. It may be obtained in larger quantities by distilling one part of alcohol, by measure, with one of sulphuric acid, and comes over, sometimes in considerable quantity, in the usual process for making carburetted hydrogen or olefiant gas. It is best purified by washing it with weak solution of subcarbonate of potassa. Its specific gravity is 1.060; it is insoluble in water, but soluble in alcohol and æther; it has a fragrant odour, and an aromatic, bitterish, and pungent flavour. In its composition and general characters it resembles the vegetable essential oils, and I have sometimes observed crystals in it of a substance having peculiar characters. It is of no use as a medicine.

Spiritus Ætheris Aromaticus.

Aromatic Spirit of Æther.

℞ Cinnamomi Corticis contusi.. drachmas tres,
Cardamomi Seminum contritorum drachmam cum semisse,
Piperis longi Fructûs contriti,
Zingiberis Radicis concisæ, singulorum drachmam,
Spiritûs Ætheris sulphurici octarium;

Macera per dies quatuordecim, in vase vitreo obturato, et cola.

Take of Cinnamon Bark bruised, three drachms,
Cardamom Seeds in powder, a drachm and a half,
Long Pepper in powder,
Ginger Root sliced, of each a drachm,
Spirit of sulphuric Æther, a pint;

Macerate for fourteen days in a well-stopped glass vessel, and filter.

Medicated æther and æthereal tinctures were formerly in high estimation, but they have properly fallen into disuse, as æther seldom requires aromatic adjuncts; their virtues too, derived from the aromatics, are annihilated by those of the

æther. The above æthereal aromatic tincture therefore is rarely if ever prescribed, and though a grateful it is not a useful stimulant.

Spiritus Ætheris Nitrici.

℞ Spiritûs rectificati octarios duos,
Acidi nitrici *pondere* uncias tres;

Spiritui Acidum paulatim adjice, et misce, cavens ne gradum 120^{mum} calor excedat; tum, leni calore, destillent fluiduncias viginti quatuor.

Spirit of Nitric Æther.

Take of Rectified Spirit, two pints,
Nitric Acid, *by weight*, three ounces;

Add the Acid to the Spirit by slow degrees, and mix, taking care that the temperature does not exceed 120°; then, by a gentle heat, distil twenty-four fluid ounces.

When equal parts of nitric acid and alcohol are mixed together at a temperature of 80°, a dangerously violent action ensues, and nearly the whole mixture is converted into gas and vapour, which, if made to pass through brine cooled down to 32°, is partly condensed into a yellowish liquid extremely volatile and equal in weight to about half the alcohol employed; it floats upon the cold salt and water, and is *nitric æther* nearly pure. Its specific gravity exceeds that of alcohol, but is less than that of water: it is almost always slightly acid, and becomes very acid and loses its ethereal characters when kept. Its taste is sweetish-bitter and very pungent; it dissolves very sparingly in water, but copiously in alcohol; the latter solution corresponds to the above *spiritus ætheris nitrici*. It consists, according to Thenard, of—

Carbon	28.45
Oxygen	48.52
Hydrogen	8.54
Nitrogen	14.49
	100

The spirit of nitric æther should be slowly distilled at a low temperature (about 180°), and not more drawn over than the formula directs. It may be conveniently distilled in a

glass retort; at Apothecaries' Hall a still is kept for the purpose, entirely composed of earthenware, with a condensing worm-pipe of the same material. The still is heated by the slow application of steam to its outer surface.

This preparation has a peculiar but grateful odour; its taste, when recently prepared, is very pungent, and slightly sweet and bitter, but when kept a few weeks it acquires a manifest acidity. It readily dissolves in water and in alcohol. When tincture of guaiacum is dropped into it, a fine and very peculiar blue tint is produced, which soon passes into various shades of green, but the mixture remains transparent: when water is added, a blue or green precipitate falls, which eventually becomes brown.

Spirit of nitric æther, or *sweet spirit* of nitre as it was formerly called, is used in medicine as a diuretic and antispasmodic; conjoined with proper regimen, it also proves diaphoretic. From half a drachm to a drachm is the usual dose, and is often given in low febrile affections, with saline remedies.

℞ Spiritûs Ætheris Nitrici f℥iij.
Liquoris Ammoniæ Acetatis f℥j.
Misturæ Camphoræ f℥ivss.
Syrupi Croci f℥ij.
Fiat mistura, cujus capiat cochlearia tria ampla subinde.

As a diuretic in dropsical affections, it is conjoined with other diuretics, such as acetate of potassa, nitre, squills, digitalis, &c.

℞ Infusi Armoraciæ compos. f℥iss.
Spiritûs Ætheris Nitrici,
Syrupi Zingiberis, āā f℥j.
Tincturæ Scillæ ℥xx.
Fiat haustus ter die sumendus.

℞ Potassæ Acetatis ℥ss.
Misturæ Camphoræ,
Infusi Quassiæ, āā f℥vj.
Syrupi Rhæados f℥j.
Tincturæ Digitalis ℥vj.
Fiat haustus ter in die sumendus.

The following often allays the troublesome tickling sensation

in the throat which attends a common catarrh, but the mixture is very apt to ferment.

℞ Oxymellis f℥j.
Syrupi Papaveris,
Spiritûs Ætheris Nitric. āā f℥ss.
Fiat linctus cujus sumatur pauxillum subinde.

Spiritus Ætheris Sulphurici.

℞ Ætheris rectificati octarium dimidium,
Spiritûs rectificati octarium;
Misce.

Spirit of Sulpuric Æther.

Take of sulphuric Æther, half a pint,
Rectified Spirit, a pint;
Mix.

This is the usual form in which æther is administered; half a drachm to a drachm and a half is the medium dose. In faintness, low spirits, and generally as a nervine stimulant, it is prescribed as in the following nervous mixture; compound spirit of lavender and syrup of red poppies being occasionally substituted for the compound spirit of ammonia and syrup of saffron, and pennyroyal-water for the camphor mixture.

℞ Misturæ Camphoræ f℥vij.
Spiritûs Ætheris Sulphurici,
——— Ammoniæ compos. āā f℥ij.
Syrupi Croci f℥ss.
Fiat mistura nervina, de qua sumantur cochlearia tria vel quatuor magna, urgente agitatione.

Spiritus Ætheris Sulphurici Compositus.

℞ Spiritûs Ætheris sulphurici octarium,
Olei Ætherei fluidrachmas duas;
Misce.

Compound Spirit of Sulphuric Æther.

Take of Spirit of sulphuric Æther, a pint,
Æthereal Oil, two fluid drachms;
Mix.

This preparation is intended as a substitute for *Hoffman's anodyne liquor*, which it closely resembles. It is given in the same doses as the preceding, and with the same effect, the æthereal oil merely altering its flavour a little. It may be dispensed with.

WINES.

Vinous tinctures are of very ancient date in pharmacy, and now for the first time expunged from the London Pharmacopœia, though the term *vinum* is retained and applied to certain compounds prepared with considerably diluted spirit. We have already noticed this innovation, when speaking of the "Vinum Antimonii Tartarizati" and of the "Vinum Ferri," in which there is a similar substitution of spirit and water for wine: of the remaining wines, that of ipecacuanha only is important, and as these three are continually employed in domestic medicine, the apothecary is obliged to keep them prepared according to the old as well as the new formulæ—the former for mothers and nurses, and the latter for physicians; and yet though very dissimilar compounds, they necessarily go under the same name, which often leads to confusion and inconvenience, and sometimes to much alarm.

Wine is certainly an objectionable menstruum in consequence of the spontaneous changes to which it is subject; yet less inconvenience would have resulted in retaining the old "wines" than in suffering the present preparations, containing no wine, to usurp their titles. Moreover, the very dilute spirit now prescribed, often forms with the dissolved matters compounds which become turbid and are subject to nearly the same changes as was formerly the case when wine was used.

There is another objection to this innovation pointed out by Mr. Phillips*, which is, that instead of using wine of nearly uniform strength, dilute spirit of very different qualities is employed. Thus the *vinum antimonii tartarizati*,

* Trans. Pharmacop. p. 228.

the *vinum ferri*, and the *vinum veratri*, contain two parts of proof spirit and three of water; *vinum aloës* contains equal parts of proof spirit and water; *vinum colchici* contains one part of proof spirit and two of water; and *vinum ipecacuanhæ* and *vinum opii* contain one part of proof spirit and one and two-thirds of water. This discrepancy in the strength of the substitute for the wine was, at all events, unnecessary.

Vinum Aloës.	*Wine of Aloes.*
℞ Aloës spicatæ Extracti uncias octo,	Take of Extract of spiked Aloe, eight ounces,
Canellæ Corticis uncias duas,	Canella Bark, two ounces,
Spiritûs tenuioris,	Proof Spirit,
Aquæ destillatæ, singulorum octarios quatuor;	Distilled Water, of each four pints;
Aloën cum arena alba, sordibus purgata, in pulverem tere; Canellæ Corticem etiam in pulverem tere; hisque, inter se mistis, Spiritum et Aquam affunde. Macera per dies quatuordecim, subindè movens, et cola.	Rub the aloes into powder with clean white sand: rub the Canella Bark also into powder, and, upon these mixed together, pour the Spirit and Water. Macerate for fourteen days, stirring occasionally, and strain.

A decoction and two tinctures are already among the liquid aloetic preparations, and the above is a very unnecessary addition. In the London Dispensatory*, Mr. Thomson has given a formula for an aloetic wine, which deserves to be more generally known and used; he justly recommends it "in dyspepsia and chlorosis, and also in that affection of the mesenteric glands in children which produces a tumid and tense abdomen." It is composed as follows, and given in the dose of from one fluidrachm to half a fluid ounce:—

℞ Sodæ Subcarbonatis ℥iij.
Ammoniæ Subcarbonatis ℥ivss.
Myrrhæ contritæ,
Aloës Extracti contusi ää ℥vj.
Vini Albi (*Sherry*) f ℥xxiv.
Macera per dies septem, et cola.

* 1822, p. 817.

Of the "Vinum Aloës" of the Pharmacopœia, one or two drachms is given as a gentle assistant to the action of the stomach and bowels, and an ounce or an ounce and a half as a decided purge.

Vinum Colchici.	*Wine of Meadow Saffron.*
℞ Colchici Radicis recentis concisæ libram, Spiritûs tenuioris fluiduncias quatuor, Aquæ destillatæ fluiduncias octo;	Take of Meadow Saffron Root, fresh and sliced, a pound, Proof Spirit, four fluid ounces, Distilled Water, eight fluid ounces;
Macera per dies quatuordecim, et cola.	Macerate for fourteen days, and strain.

This form of meadow saffron is quite inadmissible, from its extreme proneness to fermentation and decomposition. A tincture such as we have suggested above (page 424), or a vinous infusion of the dried root, are the only eligible forms for its administration, and they are quite unobjectionable. Mr. Thomson has given the following good formula for the latter*:—

"Take of the bulbs of Colchicum (dug up in July or August) sliced transversely, and dried without heat, or at a temperature not exceeding 110°, one ounce and a half; pulverise them, and pour upon the powder, put into a glass bottle, twelve fluid ounces of good sherry wine. Agitate the mixture twice a day for seven days, and then filter for use."

"The dose of this wine is from ℥xx. to ʒj. given with water only, or in combination with magnesia in the effervescing draught, or with infusion of cinchona bark, or of gentian root, or any other bitter.

Vinum Ipecacuanhæ.	*Wine of Ipecacuanha.*
℞ Ipecacuanhæ Radicis contusæ uncias duas,	Take of Ipecacuanha Root bruised, two ounces,

* Lond. Disp. 1822, p. 922.

Spiritûs tenuioris fluiduncias duodecim, Aquæ destillatæ fluiduncias viginti; Macera per dies quatuordecim, et cola.	Proof Spirit, twelve fluid ounces, Distilled Water, twenty fluid ounces; Macerate for fourteen days, and strain.

A vinous or weak spirituous infusion of ipecacuanha is a very useful preparation as furnishing a convenient means of subdividing the remedy into small doses, as an expectorant; and also, especially when sweetened a little, as an emetic for young children, to whom a teaspoonful may be given every ten or fifteen minutes till it produces vomiting. From twenty to sixty drops is expectorant, slightly aperient, and diaphoretic, especially when conjoined with saline medicines.—(See "*Ipecacuanhæ Radix*," page 103.)

Vinum Opii. — *Wine of Opium.*

℞ Extracti Opii unciam, Cinnamomi Corticis contusi, Caryophyllorum contusorum, singulorum drachmam, Spiritûs tenuioris fluiduncias sex, Aquæ destillatæ fluiduncias decem; Macera per dies octo, et cola.	Take of Extract of Opium, an ounce, Cinnamon Bark bruised, Cloves bruised, of each a drachm, Proof Spirit, six fluid ounces, Distilled Water, ten fluid ounces; Macerate for eight days, and strain.

For reasons already stated, we prefer crude opium to the extract, and consequently the *tinctura opii* to this *vinum*. If it be required to conjoin opium with aromatics, they are easily added to the simple tincture, in which, owing to the activity of its contents, the strength of the menstruum can never be objectionable. The only reason for preferring the above wine to the common tincture, and extract of opium to crude opium, is, that its taste is not so peculiarly nauseous as that of crude opium; but this is rarely of any importance, and it is covered by a properly-selected vehicle, especially by the

aromatic distilled waters. The dose of the above preparation is about the same as that of the "*Tinctura Opii*" (see page 446). It is sometimes locally applied to the eye, in cases where, after active inflammation has been subdued, the vessels remain turgid: two or three drops are dropped into the eye night and morning, till the morbid vascularity disappears. *Sydenham's liquid laudanum*, once a celebrated formula, must not be confounded with this "Wine of Opium;" it was double the strength of the above, and, in addition to the spices, contained saffron.

Vinum Veratri. — *Wine of White Hellebore.*

℞ Veratri Radicis concisæ uncias octo,	Take of White Hellebore-root sliced, eight ounces,
Spiritûs tenuioris octarium,	Proof Spirit, a pint,
Aquæ destillatæ octarium cum semisse;	Distilled Water, a pint and a half;
Macera per dies quatuordecim, et cola.	Macerate for fourteen days, and strain.

The celebrated nostrum for the gout, called *Eau Médicinale d'Husson*, was long supposed to contain white hellebore, and a number of curious facts corroborative of such a supposition were published some years ago by Mr. James Moore*. It was afterwards, however, more satisfactorily shewn that the root of the *colchicum autumnale* (see page 66) was the source of the antipodagric powers of that remedy; and it is a curious coincidence, that the researches of Pelletier and Caventou have rendered it more than probable that the same peculiar salifiable and active principle exists in white hellebore and in meadow saffron: the latter, as a medicine, is, however, more manageable and certain in its operation than the former, and is therefore preferred, indeed to the exclusion of the above preparation, which is now never prescribed. From five to

* Two Letters to Dr. Jones on the Composition of the Eau Médicinale d'Husson, &c. &c. 1811.

thirty drops of the above "wine" is a dose; for an account of its action and effects, the reader is referred to Mr. Moore's "Letters," already quoted.

VINEGARS.

Common vinegar was formerly much used as a pharmaceutical solvent, and although, in some few cases, it appears to possess peculiar advantages, it is not a desirable menstruum, in consequence of its liability to decomposition. Distilled vinegar is less objectionable, and the pure acetic acid properly diluted furnishes a still preferable substitute. But medicated vinegars have now nearly fallen into disuse, and the two which are retained in the Pharmacopœia, and to which a portion of spirit, though much too small, is added, for the purpose of preserving them from change, might, without the smallest inconvenience, have been altogether omitted.

Acetum Colchici. *Vinegar of Meadow Saffron.*

℞ Colchici Radicis recentis concisæ unciam,
Acidi acetici diluti octarium,
Spiritûs tenuioris fluidunciam;

Colchici Radicem macera cum Acido, in vase vitreo clauso, per dies tres; dein exprime, et sepone, ut fæces subsidant; denique liquori defæcato Spiritum adjice.

Take of Meadow Saffron Root fresh and sliced, an ounce,
Diluted Acetic Acid, a pint,
Proof Spirit, a fluid ounce;

Macerate the Meadow Saffron Root with the Acid in a covered glass vessel for three days; then express it, and set it by, that the dregs may subside; lastly, add the Spirit to the clear liquor.

This preparation is open to the same objections as the "Vinum Colchici"—it is not at all wanted; but if a vinegar of meadow saffron be deemed necessary, it should be prepared with the dried root. From one drachm to half a fluid ounce

of the above has been given for a dose, chiefly in conjunction with diuretics, as a part of the treatment of the dropsy, but it is not to be relied on.

Acetum Scillæ. — *Vinegar of Squill.*

℞ Scillæ Radicis recens exsiccatæ libram,
Acidi acetici diluti octarios sex,
Spiritûs tenuioris octarium dimidium;

Scillæ Radicem macera cum Acido, leni calore, in vase vitreo clauso, per horas viginti quatuor; dein exprime, et sepone, ut fæces subsidant; denique liquori defæcato spiritum adjice.

Take of Squill Root recently dried, a pound,
Diluted Acetic Acid, six pints;
Proof Spirit, half a pint;

Macerate the Squill Root with the Acid by a gentle heat, in a covered glass vessel, for twenty-four hours; then express it, and set it by that the dregs may subside; lastly, add the spirit to the clear liquor.

This, though not a bad preparation of squills, is very seldom used, the tincture or powder being preferred. When prescribed, it is generally with a view to its diuretic effect, in the dose of a drachm or two, conjoined with nitre, acetate of potassa, and other analogous remedies. In cases of mucous obstruction of the bronchiæ, an emetic composed of half a fluid ounce of vinegar of squill, ten grains of ipecacuanha, and an ounce of mint-water, has been recommended with advantage; but the preparations of squills are not, generally speaking, commendable emetics.—(See the article *Scillæ Radix* in the Materia Medica, and *Tinctura Scillæ* above.)

Vinegar of squill soon becomes turbid, but it retains its activity tolerably well.

PREPARATIONS OF HONEY.

Honey was once regarded as a powerful deobstruent and expectorant, and formed the basis of a number of balsamic

and pectoral remedies. It is now not employed, except as a mild aperient, as a vehicle for powders, and occasionally as a means of diffusing insoluble substances through water. Among the "Mellita" of the Pharmacopœia, the *mel boracis* might, without inconvenience, have been consigned to extemporaneous prescription, as it is frequently necessary to vary the quantity of borax which it contains. *Mel rosæ* is neither sufficiently useful nor elegant to justify its retention; and *oxymel scyllæ*, though an active and useful compound of that drug, may be extemporaneously and unobjectionably imitated, by the addition of tincture of squills to simple oxymel.

The preparations of honey, if properly made, and not too thin, are not very liable to ferment—their multiplicity therefore is not so objectionable as that of the "syrups;" but it is always desirable to curtail as much as possible the list of those compounds which are rarely resorted to; for they spoil and decompose by age, and in consequence of their very sparing employment, are rarely in a state fit for use when wanted.

Mel Despumatum. — *Clarified Honey.*

Mel in balneo aquoso liqua; tum spumam aufer.	Melt the honey in a water-bath; then remove the scum.

By this process, a portion of wax is the only substance that is separated in the form of scum from pure honey: if it be adulterated with flour or other extraneous substances, they either subside or are entangled by and rise with the scum. When this clarification is carefully performed, and it never should be attempted, as it often is, over the open fire, the product retains the flavour and perfume of the original honey; it should be perfectly clear, and of a brownish yellow colour, and so viscid as to pour with difficulty from one vessel to another: no water should be added to it.

The only use of clarified honey is as the basis of electuaries, and an occasional ingredient in gargles, to which it

imparts more viscidity than syrup. In the same way it is employed as a vehicle for sulphate of zinc and sulphate of copper, to form an application to the small troublesome ulcers which sometimes affects the throat and soft palate. For this purpose, five grains of sulphate of copper or of sulphate of zinc may be dissolved in half an ounce of clarified honey or of simple oxymel, and the ulcers touched three or four times daily with a camel-hair pencil dipped into the solution. In these cases it is presumed that the affection is local, or at least unattended by any marked constitutional debility, and independent of venereal affection.

Mel Boracis. — *Honey of Borax.*

℞ Sodæ Subboratis contritæ drachmam,	Take of Subborate of Soda in powder, a drachm,
Mellis despumati unciam;	Clarified Honey an ounce;
Misce.	Mix.

The medicinal uses of this preparation of borax are referred to under the article "Sodæ Subboras," in the Materia Medica; (see page 163.)

Mel Rosæ. — *Honey of Rose.*

℞ Rosæ Gallicæ Petalorum exsiccatorum uncias quatuor,	Take of Red Rose Petals dried, four ounces,
Aquæ ferventis octarios tres,	Boiling Water, three pints,
Mellis despumati libras quinque;	Clarified Honey, five pounds;
Macera Rosæ Petala in Aqua per horas sex; deinde liquori colato adjice Mel, et balneo aquoso ad idoneam crassitudinem decoque.	Macerate the Rose Petals in the Water for six hours; then to the strained liquor add the Honey, and boil them down in a water-bath to a proper consistence.

This is only useful as an addition to gargles, and with a little acid the red colour of the roses is agreeably exalted.

Oxymel Simplex.

℞ Mellis despumati libras duas;
Acidi acetici diluti octarium;

Decoque in vase vitreo, lento igne, ad idoneam crassitudinem.

Simple Oxymel.

Take of clarified Honey, two pounds,
Diluted acetic Acid, one pint;

Boil them down in a glass vessel over a slow fire, until they acquire a proper consistence.

This compound of honey and vinegar is a good addition to gargles in inflammatory sore-throat, and effectually in allaying the irritating tickling in the throat caused by a common catarrh, when taken frequently in small quantities. It is also a pleasant addition to cooling drinks in fevers.

The above formula for the preparation of oxymel is very objectionable, in consequence of the long evaporation that is required before it attains a proper consistency: the following will be found in all respects a preferable process:—

℞ Mellis despumati libras duas,
Acidi Acetici fortioris,
Aquæ destillatæ, āā f℥ij.

Misce.

The most convenient way of mixing these ingredients is to put them into an earthenware jar placed in a vessel of boiling water, by which the despumated honey is attenuated, and they are easily stirred together. Without the water, the compound is rather too thick.

Oxymel Scillæ.

℞ Mellis despumati libras tres,
Aceti Scillæ octarios duos;

Decoque in vase vitreo, lento igne, ad idoneam crassitudinem.

Oxymel of Squill.

Take of clarified Honey, three pounds,
Vinegar of Squill, two pints;

Boil them down in a glass vessel over a slow fire, until they acquire a proper consistence.

From half a drachm to two drachms of this oxymel may be

given as an expectorant where squill is proper, but the tedious evaporation required to reduce it to a due consistency appears to injure the active ingredient. The oxymels may be safely boiled in tinned-copper vessels; but if the formula above recommended for simple oxymel be followed, no boiling down is requisite.

SYRUPS.

These, with very few exceptions, are unimportant preparations; they are also objectionable from their tendency to ferment and decompose, and should therefore, as far as possible, be excluded from Pharmacopœiæ. The only general directions given respecting them, by the London College, are the following:—

Conserventur Syrupi in loco, ubi calor gradum 55^{mum} nunquam excedat.

Let Syrups be kept in a place, the temperature of which never exceeds 55°.

This is probably with a view to prevent their fermentation; but, with every practicable precaution as to temperature, those syrups which abound in vegetable mucilage become ropy and acescent, and others deposit sugar in the candied form.

Syrupus Althææ.

℞ Althææ Radicis recentis contusæ libram dimidiam,
Sacchari purificati libras duas,
Aquæ octarios quatuor;

Decoque Aquam cum Radice ad dimidiam, et liquorem frigefactum exprime. Sepone per horas viginti quatuor, ut fæces subsidant; tum liquorem effunde, atque, adjecto Saccharo, ad idoneam crassitudinem decoque.

Syrup of Marshmallow.

Take of Marshmallow Root, fresh and bruised, half a pound,
Refined Sugar, two pounds,
Water, four pints;

Boil down the Water with the Root to one half, and press out the liquor when cold. Set it by for twenty-four hours that the dregs may subside; then pour off the liquor, and, having added the Sugar, boil down to a proper consistence.

This is a particularly useless syrup, very prone to fermentation.

Syrupus Aurantiorum.

℞ Aurantiorum Corticis recentis uncias duas,
Aquæ ferventis octarium,
Sacchari purificati libras tres;

Macera Corticem in Aqua per horas duodecim, in vase leviter clauso; tum liquorem effunde, eique Saccharum adjice.

Syrup of Oranges.

Take of fresh Orange Peel, two ounces,
Boiling Water, a pint,
Refined Sugar, three pounds;

Macerate the Peel in the Water for twelve hours in a covered vessel; then pour off the liquor, and add the Sugar to it.

In this syrup the flavour of the orange peel is not sufficiently predominant to confer it upon the compounds to which it is usually added. A good substitute will be found in a mixture of two ounces of tincture of orange peel with a pint of thick simple syrup. It is improperly called syrup of *oranges*, and contains superabundance of sugar, so that it is apt to crystallise.

Syrupus Croci.

℞ Croci Stigmatum unciam,
Aquæ ferventis octarium,
Sacchari purificati libras duas cum semisse;

Macera Croci Stigmata in Aqua per horas duodecim, in vase leviter clauso; dein liquorem cola, et Saccharum adjice.

Syrup of Saffron.

Take of Saffron, an ounce,
Boiling Water, a pint,
Refined Sugar, two pounds and a half;

Macerate the Saffron in the Water for twelve hours in a covered vessel; then strain the liquor, and add the Sugar.

Syrup of saffron was once in great vogue as a nervous cordial and restorative; its only use is as a colouring material.

Syrupus Limonum.

℞ Limonum Succi colati octarium,
Sacchari purificati libras duas;

Liqua Saccharum in Succo Limonum, eodem modo quo de Syrupo simplici præceptum est.

Syrup of Lemons.

Take of Lemon Juice strained, a pint,
Refined Sugar, two pounds;

Dissolve the Sugar in the Lemon Juice in the manner directed for simple Syrup.

An elegant and agreeable syrup is afforded by this formula, but it is usually left to extemporaneous prescription. It is useful in allaying the dryness and tickling of the fauces in cases of catarrh; and, mixed with barley-water, it furnishes a very pleasant acidulous drink.

Syrupus Mori.

℞ Mori Succi colati octarium,
Sacchari purificati libras duas;

Liqua Saccharum in Succo Mori, eodem modo quo de Syrupo simplici præceptum est.

Syrup of Mulberry.

Take of Mulberry Juice strained, a pint,
Refined Sugar, two pounds;

Dissolve the Sugar in the Mulberry Juice in the same manner as directed for simple Syrup.

Fresh mulberry syrup may be used for the same purposes as syrup of lemons, and in gargles and mixtures its colour sometimes recommends it; but it is very apt to ferment, and much less pleasant in flavour than syrup of raspberries, which is now expunged.

Syrupus Papaveris.

℞ Papaveris Capsularum exsiccatarum et contusarum, demptis seminibus, uncias quatuordecim,

Syrup of Poppy.

Take of Poppy Capsules dried, bruised and free from seeds, fourteen ounces,

Sacchari purificati libras duas,
Aquæ ferventis congios duos cum semisse;

Macera Capsulas in Aqua per horas viginti quatuor; tum balneo aquoso ad congium decoque, et fortiter exprime. Liquorem colatum iterum decoque ad octarios duos, et adhuc ferventem cola. Sepone per horas duodecim, ut fæces subsidant; tum liquorem defæcatum decoque ad octarium, et Saccharum adjice, eodem modo quo de Syrupo simplici præceptum est.

Refined Sugar, two pounds,
Boiling Water, two gallons and a half;

Macerate the Capsules in the Water for twenty-four hours, then in a water-bath boil them down to one gallon, and strongly express them. Boil down this liquor again to two pints, and strain it while hot. Set it by for twelve hours, that the dregs may subside; then boil down the clear liquor to a pint, and add the Sugar in the manner directed for simple Syrup.

There is no particular necessity for the use of a water-bath in the above preparation, as the commotion of boiling keeps the capsules from the bottom of the boiler, and prevents burning. A steam-boiler is, however, best calculated for the purpose.

This syrup should be used as fresh as possible; it is then an excellent opiate, and, in the dose of a drachm or two, proves effective in allaying irritation and producing sleep, in cases where it is desirable to avoid opium in other forms: it has no taste of that drug.

Syrup of poppies is often administered as a sedative to children, but is in every way objectionable, for it is too uncertain in its strength or narcotic powers to enable us correctly to apportion the dose; and being a preparation the activity of which is often unsuspected, it is given with a degree of carelessness and inattention that is sometimes productive of dangerous, if not of fatal consequences.—(See *Papaveris Capsulæ*, page 134.) No form of opium should ever be given to children, except in cases where it is absolutely required, and under proper medical superintendence: on such occasions the tincture is the best form.

Syrupus Rhamni.

℞ Rhamni Baccarum Succi recentis octarios quatuor,

Syrup of Buckthorn.

Take of the fresh Juice of Buckthorn Berries, four pints,

Zingiberis Radicis concisæ,
Pimentæ Baccarum contritarum, singulorum unciam dimidiam,
Sacchari purificati libras tres cum semisse;

Sepone Succum per triduum, ut fæces subsidant, et cola. Succi defæcati octario Zingiberis Radicem et Pimentæ Baccas adjice; tum macera leni calore per horas quatuor, et cola; quod reliquum est ad mensuram octarii cum semisse decoque; liquores misce; et Saccharum adjice, eodem modo quo de Syrupo simplici præceptum est.

Ginger Root sliced,
Pimenta Berries in powder, of each half an ounce,
Refined Sugar, three pounds and a half;

Set by the Juice for three days, that the dregs may subside, and strain. To a pint of the clear Juice add the Ginger Root and Pimenta Berries; then macerate in a gentle heat for four hours, and strain; boil down the remainder to one pint and a half; mix the liquors; and add the Sugar in the same manner as is directed for simple Syrup.

Buckthorn is only fit for a veterinary pharmacopœia. The syrup is never prescribed, and, consequently, if found in an apothecary's shop, is always in an unfit state for use.

Syrupus Rhœados.

℞ Rhœados Petalorum recentium libram,
Aquæ ferventis octarium fluidunciis duabus,
Sacchari purificati libras duas cum semisse;

Aquæ balneo aquoso calefactæ, Rhœados Petala paulatim adjice, subindè movens; tum, vase remoto, macera per horas duodecim; dein liquorem exprime, et sepone, ut fæces subsidant; denique Saccharum adjice, eodem modo quo de Syrupo simplici præceptum est.

Syrup of Red Poppy.

Take of fresh Red Poppy Petals, a pound,
Boiling Water, a pint and two fluid ounces,
Refined Sugar, two pounds and a half;

To the Water, heated in a water-bath, gradually add the Poppy Petals, occasionally stirring them; then, having removed the vessel, macerate for twelve hours; afterwards press out the liquor, and set it by that the dregs may subside; lastly, add the Sugar in the same manner as is directed for simple Syrup.

This syrup is of no further use than as a colouring matter; it is very liable to ferment and become ropy in warm weather.

Syrupus Rosæ.

℞ Rosæ centifoliæ Petalorum exsiccatorum uncias septem,
Sacchari purificati libras sex,
Aquæ ferventis octarios quatuor;

Macera Rosæ Petala in Aqua per horas duodecim, et cola. Liquorem colatum balneo aquoso consume ad octarios duos cum semisse; dein Saccharum adjice, eodem modo quo de Syrupo simplici præceptum est.

Syrup of Roses.

Take of Damask Rose Petals dried, seven ounces,
Refined Sugar, six pounds,
Boiling Water, four pints;

Macerate the Rose Petals in the Water for twelve hours, and strain; evaporate the strained liquor by the aid of a water-bath to two pints and a half; then add the Sugar in the manner directed for simple Syrup.

This, like the preceding syrup, is useless except on account of its colouring matter, which becomes of a lively red when added to acid mixtures, and is rendered green or yellow by the alkalies.

Syrupus Sarsaparillæ.

℞ Sarsaparillæ Radicis concisæ libram,
Aquæ ferventis congium,
Sacchari purificati libram;

Macera Radicem in Aqua per horas viginti quatuor; tum decoque ad octarios quatuor, et liquorem adhuc calentem cola; dein adjice Saccharum, et ad idoneam crassitudinem consume.

Syrup of Sarsaparilla.

Take of Sarsaparilla Root sliced, a pound,
Boiling Water, a gallon,
Refined Sugar, a pound;

Macerate the Root in the Water for twenty-four hours; then boil down to four pints, and strain the liquor while hot; then add the sugar, and evaporate to a proper consistency.

A very strong decoction of sarsaparilla, made into a syrup, was originally prepared by Mr. Fisher, as a convenient and portable form for the administration of that remedy; it is not liable to ferment, nor is it disagreeable when diluted with water. It has lately been much prescribed, and hence, probably, the introduction of the above formula into the present Pharmacopœia. It is improved by the addition of a few cloves, and may be taken as an alterative, in the dose of a

dessert spoonful, three or four times a day. The sugar is very apt to disagree with some stomachs.—(See *Sarsaparillæ Radix*, page 154, and *Extractum Sarsaparillæ*, page 403.)

Syrupus Sennæ.

℞ Sennæ Foliorum uncias duas,
Fœniculi Seminum contusorum unciam,
Mannæ uncias tres,
Sacchari purificati libram,
Aquæ ferventis octarium;

Sennæ Folia et Fœniculi Semina in Aqua macera leni calore per horam. Liquorem cola, et cum hoc Mannam et Saccharum misce; dein decoque ad idoneam crassitudinem.

Syrup of Senna.

Take of Senna Leaves, two ounces,
Fennel seeds bruised, an ounce,
Manna, three ounces,
Refined Sugar, a pound,
Boiling Water, a pint;

Macerate the Senna Leaves and Fennel Seeds in the Water for an hour, with a gentle heat. Strain the liquor, and mix with it the Manna and the sugar; then boil down to a proper consistency.

This inconvenient and useless "Syrup" generally is found in a concrete state. It is prepared as a carminative aperient for children, but the flavour of the fennel is very fugitive, and the whole mixture is most unpharmaceutical.

Syrupus Simplex.

℞ Sacchari purificati libras duas cum semisse,
Aquæ octarium;

Liqua Saccharum in Aqua balneo aquoso; tum sepone per horas viginti quatuor; dein spumam aufer, et à fæcibus, si quæ sint, liquorem purum effunde.

Simple Syrup.

Take of Refined Sugar, two pounds and a half,
Water, a pint;

Dissolve the Sugar in the Water by a water-bath; then set the solution aside for twenty-four hours; after which take off the scum, and if there be any dregs, pour off the clear liquor.

Simple syrup should be clear and nearly colourless; it is a

very convenient form of sugar for a variety of pharmaceutical purposes; it saves the time and trouble of weighing and dissolving the solid material.

Syrupus Tolutanus.

℞ Balsami Tolutani unciam,
Aquæ ferventis octarium,
Sacchari purificati libras duas;

Coque Balsamum in Aqua per horam dimidiam in vase clauso, subinde movens, et liquorem refrigeratum cola; dein Saccharum adjice, eodem modo quo de Syrupo simplici præceptum est.

Syrup of Tolu.

Take of Balsam of Tolu, an ounce,
Boiling Water, a pint,
Refined Sugar, two pounds;

Boil the Balsam in the Water for half an hour in a covered vessel, stirring them occasionally, and strain the liquor when cold; then add the Sugar, in the manner directed for simple Syrup.

The same portion of balsam is generally repeatedly used in this preparation, and it long continues to impart flavour when boiled in water. The syrup has a pleasant and elegant flavour, but it is more readily, and equally well prepared by the addition of tincture of tolu to simple syrup; the tincture is, however, now omitted in the Pharmacopœia.

Syrupus Zingiberis.

℞ Zingiberis Radicis concisæ uncias duas,
Aquæ ferventis octarium,
Sacchari purificati libras duas;

Macera Zingiberis Radicem in Aqua per horas quatuor, et cola; dein Saccharum adjice, eodem modo quo de Syrupo simplici præceptum est.

Syrup of Ginger.

Take of Ginger Root sliced, two ounces,
Boiling Water, a pint,
Refined Sugar, two pounds;

Macerate the Ginger Root in the Water for four hours, and strain; then add the Sugar as directed for simple Syrup.

With double the prescribed quantity of ginger, this syrup is a good adjunct to purgatives and stomachic bitters. It is too weak as it is, to be of much use.

CONFECTIONS.

Under this term are now included the *conserves* and *electuaries* of former Pharmacopœia. They are inefficient and inconvenient preparations, in consequence of the quantity of sugar which most of them contain, and of their tendency to spoil or become dry. The following are the only general directions respecting them :—

Confectiones, si diu servatæ indurescant, Aquâ humectandæ sunt, ut idonea crassitudo restituatur.

If Confections, when long kept, have become indurated, they are to be moistened with water, so that a proper consistency may be restored.

Confectio Amygdalarum.

℞ Amygdalarum dulcium unciam,
Acaciæ Gummi contriti drachmam,
Sacchari purificati unciam dimidiam;

Amygdalis priùs in Aqua maceratis, demptisque pelliculis, omnia simul contunde, donec corpus unum sit.

Confection of Almonds.

Take of Sweet Almonds, an ounce,
Gum Arabic in powder, a drachm,
Refined Sugar, half an ounce;

Having first macerated the Almonds in Water, and removed their external covering, pound all the ingredients, until they are incorporated.

This is a convenient paste for the preparation of the *mistura amygdalarum*, and may be long kept without acquiring rancidity, if made strictly according to the above directions; but if any water be added to the ingredients, the confection very soon becomes mouldy.

Confectio Aromatica.

℞ Cinnamomi Corticis,
Myristicæ Nucleorum, singulorum uncias duas,
Caryophyllorum unciam,
Cardamomi Seminum unciam dimidiam,
Croci Stigmatum exsiccatorum uncias duas,
Testarum præparatarum uncias sedecim,
Sacchari purificati contriti libras duas,
Aquæ octarium;

Arida simul in pulverem subtilissimum tere; tum Aquam paulatim adjice, et misce, donec corpus unum sit.

Aromatic Confection.

Take of Cinnamon Bark,
Nutmegs, of each two ounces,
Cloves, an ounce,
Cardamom Seeds, half an ounce,
Saffron dried, two ounces,
Prepared Oyster Shells, sixteen ounces,
Refined Sugar in powder, two pounds,
Water, a pint;

Reduce the dry ingredients to a very fine powder together; then gradually add the Water, and mix until they are incorporated.

This is a combination of aromatics, often found useful in practice: it is given, diffused in draughts or mixtures, in the dose of from twenty grains to a drachm, and is a proper addition to æthereal and tonic remedies in low fevers and other cases where warm stimulants are indicated. It is generally very agreeable to the stomach, relieving flatulence and nausea, and sometimes checking obstinate and alarming vomiting, especially where it occurs in broken constitutions, or is brought on by the injudicious use of mercury: in such cases the following mixture may be prescribed:—

℞ Potassæ Carbonatis ℥jss.
Misturæ Camphoræ f ℥vss.
Confectionis Aromaticæ ℥ij.
Spiritûs Myristicæ f ℥ss.
M. fiat mistura, cujus sumatur cochlearia tria ampla cum cochleare uno Succi Limonum recentis, in actu effervescentiæ.

Confectio Aurantiorum.

℞ Aurantiorum Corticis exterioris recentis radulâ separati, libram,

Confection of Oranges.

Take of the outer fresh Rind of Oranges separated by a rasp, a pound,

Sacchari purificati libras tres;

Corticem, in mortario lapideo, pistillo ligneo contunde; tum, adjecto Saccharo, iterum contunde, donec corpus unum sit.

Refined Sugar, three pounds;

Bruise the Rind in a stone mortar with a wooden pestle; then, having added the Sugar, pound them until they are incorporated.

The principal use of confection of orange peel is as an agreeable stomachic vehicle for tonic powders; but it is scarcely of sufficient importance to sanction its retention, and is apt to deteriorate by keeping. It may be thinned, when prescribed in electuaries, with syrup of orange peel or of ginger, and is a proper vehicle for red oxide (subcarbonate) of iron, which may be prescribed as follows:—

℞ Ferri Subcarbonatis,
Syrupi Zingiberis, āā ℥ss.
Confectionis Aurantiorum ℥ij.
M. fiat electuarium, de quo capiatur molem nucis moschatæ bis vel ter quotidie.

Confectio Cassiæ.

℞ Cassiæ Pulpæ recentis libram dimidiam,
Mannæ uncias duas,
Tamarindi Pulpæ unciam,
Syrupi Rosæ octarium dimidium;

Mannam contunde; tum, balneo aquoso, in Syrupo liqua; deinde admisce pulpas, et humorem consume, donec idonea fiat crassitudo.

Confection of Cassia.

Take of fresh Cassia Pulp, half a pound,
Manna, two ounces,
Tamarind Pulp, an ounce,
Syrup of Roses, half a pint;

Bruise the Manna, then dissolve it in the Syrup with the aid of a water-bath; then mix in the pulps, and evaporate the moisture till it acquires a proper consistency.

This is a griping, windy, and ineffective purgative, not wanted as an adjunct to other aperients, for which alone it is proper.

Confectio Opii.

℞ Opii duri contriti drachmas sex,
Piperis longi Fructûs unciam,
Zingiberis Radicis uncias duas,
Carui Seminum uncias tres,
Tragacanthæ contritæ drachmas duas,
Syrupi octarium;

Opium cum Syrupo calefacto contere; tum cætera contrita adjice, et misce.

Confection of Opium.

Take of hard Opium in powder, six drachms,
Long Pepper, an ounce,
Ginger Root, two ounces,
Caraway Seeds, three ounces,
Tragacanth in powder, two drachms,
Syrup, a pint;

Heat the Syrup, and rub the Opium with it; then add the other ingredients in powder, and mix.

Thirty-six grains of this confection contain about one grain of opium. It is a useful remedy in checking common diarrhœa, in some forms of chronic rheumatism, and in atonic gout. From ten grains to one drachm are given in such cases, diffused through chalk mixture, camphor mixture, or any of the aromatic waters.

Confectio Piperis Nigri.

℞ Piperis nigri,
Helenii Radicis, singulorum libram,
Fœniculi Seminum libras tres,
Mellis,
Sacchari purificati, singulorum libras duas;

Arida simul in pulverem subtilissimum tere; dein, adjecto Melle, contunde, donec corpus unum sit.

Confection of Black Pepper.

Take of Black Pepper,
Elecampane Root, of each a pound,
Fennel Seeds, three pounds,
Honey,
Refined Sugar, of each two pounds;

Rub the dry ingredients together, into a very fine powder; then, having added the Honey, rub them till the whole is incorporated.

This is "Ward's Paste for the Piles," a mischievous remedy when indiscriminately and carelessly used, especially in plethoric and feverish habits. Where there is constitutional sluggishness and debility, it proves useful in stimulating the

secretory surface of the rectum. Ward was originally a footman, and during his attendance upon his master, on the Continent, obtained from the monks those receipts which he afterwards vended as *nostrums*.

Confectio Rosæ Caninæ.

℞ Rosæ caninæ Pulpæ libram,
Sacchari purificati contriti uncias viginti;

Pulpam, in balneo aquoso, leni calori expone; tum saccharum paulatim adjice, et tere simul, donec corpus unum sit.

Confection of Dog Rose.

Take of Dog Rose Pulp, a pound,
Refined Sugar in Powder, twenty ounces;

Expose the Pulp to a gentle heat in a water-bath, then add the Sugar by degrees, and rub them together until they are incorporated.

In pectoral electuaries and linctuses, this conserve is sometimes conveniently used in consequence of its viscid tenacity; on the whole, however, it is an insignificant preparation, and objectionable on account of the facility with which it becomes indurated when kept.

Confectio Rosæ Gallicæ.

℞ Rosæ Gallicæ Petalorum nondum explicatorum, abjectis unguibus, libram,
Sacchari purificati libras tres;

Petala in mortario lapideo contunde; tum, adjecto Saccharo, iterum contunde, donec corpus unum sit.

Confection of Red Roses.

Take of Red Rose Petals before they blow, and without their calyces, a pound,
Refined Sugar, three pounds;

Pound the Petals in a stone mortar, then, having added the Sugar, pound them again until they are incorporated.

The principal use of this confection is in the formation of pills, and as an occasional adjunct to or vehicle for other more active remedies in the form of electuary. It long retains its

moisture and consistency, and is neither liable to mouldiness nor fermentation.

Confectio Rutæ.

℞ Rutæ Foliorum exsiccatorum,
Carui Seminum,
Lauri Baccarum, singulorum unciam cum semisse,
Sagapeni unciam dimidiam,
Piperis nigri Fructûs drachmas duas,
Mellis despumati uncias sedecim;

Arida simul in pulverem subtilissimum tere; tum, adjecto Melle, omnia misce.

Confection of Rue.

Take of Rue Leaves dried,
Caraway Seeds,
Bay Berries, of each an ounce and a half,
Sagapenum, half an ounce,
Black Pepper, two drachms,
Clarified Honey, sixteen ounces;

Rub the dry ingredients together to a very fine powder; then, having added the honey, mix all together.

This is a nauseous and useless confection, which is never prescribed, and should have been thrown out of the Pharmacopœia.

Confectio Scammoneæ.

℞ Scammoneæ Gummi-resinæ contritæ unciam cum semisse,
Caryophyllorum contusorum,
Zingiberis Radicis contritæ, singulorum drachmas sex,
Olei Carui fluid drachmam dimidiam,
Syrupi Rosæ quantum satis sit;

Arida simul in pulverem subtilissimum tere; tum, instillato Syrupo, iterum tere; dein, adjecto Oleo Carui, omnia misce.

Confection of Scammony.

Take of Scammony Gum-resin in powder, an ounce and a half,
Cloves bruised,
Ginger Root in powder, of each six drachms,
Oil of Caraway, half a fluid drachm.
Syrup of Roses, a sufficient quantity;

Rub the dry ingredients together to a very fine powder; then, having dropped in the Syrup, rub again; and lastly, having added the Oil of Caraway, mix all together.

This is a very ineligible form for the exhibition of scammony; it is never prescribed, and therefore, with the preceding confection, should have been rejected from the officinal formulæ.

Confectio Sennæ.

℞ Sennæ Foliorum uncias octo,
Caricæ Fructûs libram,
Tamarindi Pulpæ,
Cassiæ Pulpæ,
Prunorum Pulpæ, singulorum libram dimidiam,
Coriandri Seminum uncias quatuor,
Glycyrrhizæ Radicis uncias tres,
Sacchari purificati libras duas cum semisse;

Sennæ Folia cum Coriandri Seminibus tere, et cribro separa pulveris misti uncias decem. Residuum cum Caricæ Fructu et Glycyrrhizæ Radice ex Aquæ octariis quatuor ad dimidium decoque; deinde exprime, et cola. Liquorem colatum balneo aquoso consume, donec octarius cum semisse ex toto restet; tum, adjecto Saccharo, fiat Syrupus. Denique cum Syrupo Pulpas paulatim contere, et, injecto pulvere cribrato, omnia misce.

Confection of Senna.

Take of Senna Leaves, eight ounces,
Figs, a pound,
Tamarind Pulp,
Cassia Pulp,
Pulp of Prunes, of each half a pound,
Coriander Seeds, four ounces,
Liquorice Root, three ounces,
Refined Sugar, two pounds and a half;

Rub the Senna Leaves with the Coriander Seeds, and separate ten ounces of the mixed powder by a sieve. Boil the remainder with the Figs and the Liquorice in four pints of Water down to one half; then express the liquor, and strain. Evaporate the strained liquor in a water-bath, until the whole is reduced to a pint and a half; then add the Sugar to form a Syrup. Lastly, rub the Pulps gradually with the Syrup, and, having added the sifted powder, mix all together.

With all its imperfections, this, which is the old and well-known *lenitive electuary*, is a useful preparation, rather apt to ferment in warm weather, and to gripe when given alone: it is, however, a good vehicle for the exhibition of more powerful cathartics, in which capacity it has already been spoken of (page 103). The process of the above formula is tiresome and expensive, and there are many temptations to sophistication,

Dr. Paris says, that jalap, blackened with walnut liquor, is frequently substituted for the pulp of cassia; and the great bulk of it sold in London is little else than prunes, figs, and jalap. He adds, "I understand that a considerable quantity is also manufactured in Staffordshire, in which unsound and spoilt apples enter as a principal ingredient. The preparation sold at Apothecaries' Hall is certainly unique in excellence*."

POWDERS.

The *compound powders*, as they should be called, of the present Pharmacopœia, are more numerous than practice requires; but this, in respect to them, is of little consequence, as they usually contain materials not liable to much deterioration by age. Their ingredients should be of such a nature as to suffer little from long exposure to air; they should neither be deliquescent, efflorescent, nor volatile. It has been supposed that many substances suffer considerable change of properties, in consequence of the facility with which the air acts upon them when in the state of powder; and this, not so much in consequence of the evaporation or loss of any volatile ingredient, as by the absorption of oxygen, and the consequent change of some of their more fixed principles, especially the extractive matter: but, although some such change is effected in many powders, we have no distinct evidence of any corresponding diminution of their medicinal virtues.

In the preparation of the officinal compound powders, especially of those which contain ingredients of very different specific gravities, or which consist of inert, combined with very active ingredients, the utmost attention is required to ensure their perfect and equable mixture. For this purpose, such of them as have been passed through a sieve should be afterwards triturated for a sufficient time in a shallow mortar, in such a

* Pharmacologia, vol. ii. p. 159.

way as to blend all their parts thoroughly together; after which, they should be shaken as little as possible, for mere agitation often tends to separate their ingredients. These powders should be kept in well-corked bottles, and should not be much exposed to air and light.

Pulvis Aloës Compositus. *Compound Powder of Aloes.*

℞ Aloës spicatæ Extracti unciam cum semisse,
Guaiaci Gummi-resinæ unciam,
Pulveris Cinnamomi compositi unciam dimidiam;

Aloës Extractum et Guaiaci Gummi-resinam separatim in pulverem tere; dein cum Pulvere Cinnamomi composito misce.

Take of Extract of spiked Aloe, an ounce and a half,
Guaiacum Gum-resin, an ounce,
Compound Powder of Cinnamon, half an ounce;

Rub the Extract and the Guaiacum separately to powder; then mix them with the Compound Powder of Cinnamon.

The "compound powder of aloes" is the most inapplicable of all the forms for the administration of that drug; it is, moreover, exceedingly nauseous. Some practitioners use it where a warm diaphoretic purge is wanted, in the dose of about fifteen grains, which should be formed into three or four pills, with mucilage of acacia.

Pulvis Cinnamomi Compositus. *Compound Powder of Cinnamon.*

℞ Cinnamomi Corticis uncias duas,
Cardamomi Seminum unciam cum semisse,
Zingiberis Radicis unciam,
Piperis longi Fructûs unciam dimidiam;

Tere simul, ut fiat pulvis subtilissimus.

Take of Cinnamon Bark, two ounces,
Cardamom Seeds, an ounce and a half,
Ginger, an ounce,
Long Pepper, half an ounce,

Rub them together, so as to form a very fine powder.

This (the old *pulvis aromaticus*) is a warm combination of spices, useful as an addition to other remedies, as in the preceding formula. In the proportion of five or ten grains to each dose, it is a proper adjunct to the powder of Peruvian bark; to oxide of iron, as in the formula at page 273, and to sulphate of iron, as at page 276; but it does not generally bind well with pill masses; and where an aromatic addition is wanted in draughts or mixtures, the "confectio aromatica" is preferable.

Pulvis Contrajervæ Compositus.	*Compound Powder of Contrajerva.*
℞ Contrajervæ Radicis contritæ uncias quinque, Testarum præparatarum libram cum semisse; Misce.	Take of Contrajerva Root in powder, five ounces, Prepared Oyster shells, a pound and a half; Mix.

See "Contrajervæ Radix," among the articles of the Materia Medica (page 70).

Pulvis Cornu Usti cum Opio.	*Powder of Calcined Hartshorn with Opium.*
℞ Opii duri contriti drachmam, Cornuum ustorum et præparatorum unciam, Cocci contriti drachmam; Misce.	Take of hard Opium in powder, a drachm, Hartshorn calcined and prepared, an ounce, Cochineal in powder, a drachm; Mix.

In this powder the opium is mixed with the inert bone-

earth, merely for the sake of its subdivision; the use of the cochineal is not obvious. Ten grains contain one grain of opium.

Pulvis Cretæ Compositus.

℞ Cretæ preparatæ libram dimidiam,
Cinnamomi Corticis uncias quatuor,
Tormentillæ Radicis,
Acaciæ Gummi, singulorum uncias tres,
Piperis longi Fructûs unciam dimidiam;

Separatim in pulverem subtilissimum tere; dein misce.

Compound Powder of Chalk.

Take of prepared Chalk, half a pound,
Cinnamon Bark, four ounces,
Tormentil Root,
Gum Acacia, of each three ounces,
Long Pepper, half an ounce;

Reduce them separately into very fine powder; then mix.

This is a good antacid astringent powder warmed by the addition of the cinnamon and long pepper. It comforts the bowels in diarrhœa, after a rhubarb purge has been administered, and is prescribed in the dose of from ten grains to half a drachm in some of the carminative waters.

Pulvis Cretæ Compositus cum Opio.

℞ Pulveris Cretæ compositi uncias sex cum semisse,
Opii duri contriti scrupulos quatuor;

Misce.

Compound Powder of Chalk with Opium.

Take of Compound Powder of Chalk, six ounces and a half,
Hard Opium in powder, four scruples;

Mix.

Two scruples of this powder contain a grain of opium,

whence it derives additional power in checking diarrhœa: but it is a needless formula.

Pulvis Ipecacuanhæ Compositus.	*Compound Powder of Ipecacuanha.*
℞ Ipecacuanhæ Radicis contritæ, Opii duri contriti, singulorum drachmam, Potassæ Sulphatis contritæ unciam;	Take of Ipecacuanha Root in powder, Hard Opium in powder, of each a drachm, Sulphate of Potassa in powder, an ounce;
Misce.	Mix.

A grain of opium is contained in ten grains of this powder, which is a truly valuable sudorific: it should be given at bed-time in a small quantity of liquid, for it is apt to vomit if copious drinking be resorted to immediately after its administration. In febrile and rheumatic affections, and in all cases where a certainly acting sedative diaphoretic is required, its certainty of effect especially recommends it: its peculiarity of action has been adverted to at page 105.

The combination of ipecacuanha and opium in the above powder contributes mainly to its activity, and the sulphate of potassa is a convenient and proper vehicle. In the original "Dover's Powder," the saline ingredient was obtained by deflagrating nitre with sulphate of potassa; but the result of such an operation is a deliquescent saline mixture, and therefore less appropriate than simple sulphate of potassa, though nitre is often a very proper adjunct.

In the dose of five grains, this powder often proves effective, especially if conjoined with an equal quantity of mercurial pill, where that remedy is not contra-indicated, or with half a grain of calomel. From ten to twenty grains in a common saline draught, is the usual mode of prescribing it where its full sudorific power is wanted; it is, however, less apt to nauseate when given in the form of pills or in a little currant-jelly, or thick gruel.

Pulvis Kino Compositus. *Compound Powder of Kino.*

℞ Kino drachmas quindecim,
Cinnamomi Corticis unciam dimidiam,
Opii duri drachmam;

Separatim in pulverem subtilissimum tere; dein misce.

Take of Kino, fifteen drachms,
Cinnamon Bark, half an ounce,
Hard Opium, a drachm;

Reduce them separately to very fine powder, and then mix.

Twenty grains of this powder include one grain of opium; its use is almost limited to the cure of diarrhœa; but it is also applicable in some dyspeptic affections, and in the milder forms of pyrosis.

Pulvis Scammoneæ Compositus. *Compound Powder of Scammony.*

℞ Scammonæ Gummi-resinæ,
Extracti Jalapæ duri, singulorum uncias duas,
Zingiberis Radicis unciam dimidiam;

Separatim in pulverem subtilissimum tere; dein misce.

Take of Scammony Gum-resin,
Hard Extract of Jalap, of each two ounces,
Ginger Root, half an ounce;

Reduce them separately to very fine powder; and then mix.

This powder is sometimes prescribed as a purge, in the dose of from ten to twenty grains, but is not a convenient form. The addition of a grain of calomel to five of the powder renders it something like the old *pulvis basilicus*, a good active purge for children.—(See *Scammoneæ Gummi-resina*, page 156.)

Pulvis Sennæ Compositus. *Compound Powder of Senna.*

℞ Sennæ Foliorum,
Potassæ Supertartratis, singulorum uncias duas,

Take of Senna Leaves,
Supertartrate of Potassa, of each two ounces,

Scammoneæ Gummi-resinæ unciam dimidiam, Zingiberis Radicis drachmas duas;	Scammony Gum-resin, half an ounce, Ginger Root, two drachms;
Scammoneæ Gummi-resinam per se, cætera simul, in pulverem subtilissimum tere; tum misce.	Reduce the Scammony Gum-resin separately, and the rest together, to very fine powder; then mix.

This powder presents an ill-assorted mixture of aperients, and is bulky and inconvenient to administer. It is probably intended as a hydragogue cathartic for dropsical cases. The average dose is about half a drachm.

Pulvis Tragacanthæ Compositus.	*Compound Powder of Tragacanth.*
℞ Tragacanthæ contritæ, Acaciæ Gummi contriti, Amyli, singulorum unciam cum semisse, Sacchari purificati uncias tres;	Take of Tragacanth in powder, Gum Arabic in powder, Starch, of each an ounce and a half, Refined Sugar, three ounces;
Amylum et Saccharum simul in pulverem tere; tum, adjectis Tragacanthâ et Acaciæ Gummi, omnia misce.	Grind the Starch and Sugar together; then having added the Tragacanth and Gum Arabic, mix them all.

This powder is chiefly useful as a vehicle for more active remedies. It is given in febrile affections with nitre; in dysentery, with small doses of ipecacuanha; and in renal and calculous irritation, with opium and other sedatives. It is properly prescribed as a glutinous vehicle for calomel and other heavy insoluble powders.

PILLS.

Pills are an eligible form for those remedies which are very active in small doses, and insoluble or difficultly soluble in

water, or which are very nauseous to the palate, but they should almost always be left to extemporaneous prescription, for the masses as directed in the Pharmacopœia, if originally of a proper consistence, soon become too hard, or undergo other changes which render them unfit for use.

Pills are generally strewed over with starch, magnesia, liquorice powder, or lycopodium, to prevent their adhesion; and these powders, or the external application of gold or silver leaf, render those which are nauseous less apt to be tasted in the act of their deglutition.

With one or two exceptions, pills should be excluded from the formulæ of a Pharmacopœia, and left entirely to extemporaneous prescription; or their ingredients should be kept in the form of powder, and made into a mass at the time they are required for use.

When too long kept, most pills are apt to become very hard, and proportionately difficult of solubility in the stomach; so that in this way very active remedies may lose their efficacy, or become so indurated as in some cases to be voided with little alteration, after having passed the stomach and bowels. Soap, soluble saline substances, and sugar, are the best additions to obviate such source of their inactivity.

Pilulæ Aloës Compositæ.	*Compound Pills of Aloes.*
℞ Aloës spicatæ Extracti contriti unciam, Extracti Gentianæ unciam dimidiam, Olei Carui minima quadraginta, Syrupi simplicis quantum satis sit;	Take of Extract of spiked Aloe in powder, an ounce, Extract of Gentian, half an ounce, Oil of Caraway, forty minims, Simple Syrup, a sufficient quantity;
Simul contunde, donec corpus unum sit.	Beat them together until incorporated.

Aloes, combined with bitters and aromatics, is often resorted to in habitual costiveness and some forms of dyspepsia: the above pill is apt to be too soft to retain its form,

otherwise the combination is good. From five to twenty grains is a dose: two pills of five grains each, taken two hours before dinner, generally evacuate the bowels once or twice in the evening or following morning.

Pilulæ Aloës cum Myrrha.

℞ Aloës spicatæ Extracti uncias duas,

Croci Stigmatum,
Myrrhæ, singulorum unciam,
Syrupi simplicis quantum satis sit;

Aloës Extractum et Myrrham separatim in pulverem tere; tum omnia simul contunde donec corpus unum sit.

Pills of Aloes with Myrrh.

Take of Extract of spiked Aloe, two ounces,
Saffron,
Myrrh, of each an ounce,
Simple Syrup, a sufficient quantity;

Reduce the Extract and the Myrrh separately to powder; then beat the whole together until incorporated.

These pills have long had a place in the different Pharmacopœiæ, under the name of *Pilulæ Rufi.* The saffron is useless, except, perhaps, as dividing the other ingredients; but the mixture of myrrh and aloes affords a good purge in chlorotic and leucophlegmatic habits. Two or three pills of five grains each may be taken twice or thrice daily, and the mass is frequently conjoined with the sulphate or some other preparation of iron.

Pilulæ Cambogiæ Compositæ.

℞ Cambogiæ contritæ drachmam,
Aloës spicatæ Extracti contriti drachmam cum semisse,
Zingiberis drachmam dimidiam,

Saponis duri drachmas duas;

Compound Pills of Camboge.

Take of Camboge in powder, a drachm,
Extract of spiked Aloe in powder, a drachm and half,
Ginger in powder, half a drachm,
Hard Soap, two drachms;

Misce inter se pulveres; dein, adjecto Sapone, omnia simul contunde donec corpus unum sit.

Mix the powders together; then, having added the Soap, beat the whole together until incorporated.

The combination of the readily soluble gamboge with the less soluble aloes is by some supposed to render the former more slow and mild in its action: be this as it may, these pills are effectively and often drastically purgative, in the dose of ten or fifteen grains. They are occasionally conjoined with other cathartics, with calomel, for instance, and with compound extract of colocynth, but gamboge is always apt to nauseate, and is rarely prescribed except as a hydragogue.

Pilulæ Ferri Compositæ. — *Compound Pills of Iron.*

℞ Myrrhæ contritæ drachmas duas,
Sodæ Subcarbonatis,
Ferri Sulphatis,
Sacchari, singulorum drachmam;

Tere Myrrham cum Sodæ Subcarbonate; tum, adjectâ Ferri Sulphate, iterum tere; dein omnia simul contunde, donec corpus unum sit.

Take of Myrrh in powder, two drachms,
Subcarbonate of Soda,
Sulphate of Iron,
Sugar, of each a drachm;

Rub the Myrrh with the Subcarbonate of Soda; then, having added the Sulphate of Iron, rub the mixture again, and beat the whole together until incorporated.

These pills are tonic and emmenagogue; they may be given in the dose of ten or fifteen grains two or three times a day, with any bitter infusion; they are a solid substitute for the *mistura ferri composita*, but the latter is a preferable chalybeate: a corresponding preparation with the addition of aloes will be found at page 122; and other formulæ for the administration of chalybeates in the shape of pills will be found at pages 273 and 276. The general account of iron under the article "Ferrum," in the Materia Medica, may also here be referred to.

Pilulæ Galbani Compositæ. *Compound Galbanum Pills.*

℞ Galbani Gummi-resinæ unciam,
Myrrhæ,
Sagapeni, singulorum unciam cum semisse,
Assafœtidæ Gummi-resinæ unciam dimidiam,
Syrupi simplicis quantum satis sit;

Simul contunde, donec corpus unum sit.

Take of Galbanum Gum Resin, an ounce,
Myrrh,
Sagapenum, of each an ounce and a half,
Assafœtida Gum-resin, half an ounce,
Simple Syrup, a sufficient quantity;

Beat them together till they are incorporated.

This combination of fetid gums is chiefly prescribed in hysteria and chlorosis, and sometimes in spasm or cramp of the stomach. When desirable to conjoin it with chalybeates, an equal part of the *pilulæ ferri compositæ* may be added, or, where aloetics are required, of the *pilulæ aloës cum myrrha;* but neither the galbanum nor the sagapenum are of much use. Ten grains of the pill, or of its mixtures, are divided into two pills, and given twice a day.

Pilulæ Hydrargyri. *Mercurial Pills.*

℞ Hydrargyri purificati drachmas duas,
Confectionis Rosæ Gallicæ drachmas tres,
Glycyrrhizæ Radicis contritæ drachmam;

Hydrargyrum cum Confectione tere, donec globuli non ampliùs conspiciantur; deinde, adjectâ Glycyrrhizæ Radice, omnia simul contunde, donec corpus unum sit.

Take of Purified Mercury, two drachms,
Confection of Red Roses, three drachms,
Liquorice Root in powder, a drachm;

Rub the Mercury with the Confection until the globules are no longer visible; then having added the Liquorice Root, beat the whole together until incorporated.

Protoxide of mercury is the active ingredient in these pills, and they furnish a most valuable mercurial preparation. Of

their general use and effects we have spoken above, under the article "Hydrargyrum," in the Materia Medica (see page 95); at page 107, one of the diuretic combinations of this remedy is prescribed; and at page 253 will be found one of its forms as an alterative; some further remarks respecting it are also given under the preparations of mercury (page 284).

Three grains of the above mass contain one grain of mercury, but the dose is extremely various, depending upon the required effect, and varies from half a grain to twenty grains.

In the manufacture of this pill, substances are occasionally added to accelerate the incorporation and oxidizement of the mercury; but these sophistications are invariably prejudicial, and tend to render the operation of the medicine variable and uncertain. At Apothecaries' Hall, a machine impelled by the steam-engine is employed for the purpose of a triturating and blending the ingredients, consisting of a circular iron trough for the reception of the materials, in which revolve four wooden cylinders, having also a motion on their axes: in this way the admixture of the mercury is perfectly and unexceptionably effected.

Pilulæ Hydrargyri Submuriatis Compositæ.

℞ Hydrargyri Submuriatis,
Antimonii Sulphureti præcipitati, singulorum drachmas duas,
Guaiaci Gummi-resinæ contritæ semunciam,
Spiritûs rectificati drachmam dimidiam;

Tere Hydrargyri Submuriatem cum Antimonii Sulphureto præcipitato, dein cum Guaiaci Gummi-resina, et adjice Spiritum, ut fiat idonea crassitudo.

Compound Pills of Submuriate of Mercury.

Take of Submuriate of Mercury,
Precipitated Sulphuret of Antimony, of each two drachms,
Guaiacum Gum-Resin in powder, half an ounce,
Rectified Spirit, half a drachm;

Rub the Submuriate of Mercury with the precipitated Sulphuret of Antimony, then with the Guaiacum, and add the Spirit, so as to obtain a proper consistency.

From five to ten grains of these pills, originally introduced by Dr. Plummer, are occasionally given in cutaneous eruptions and chronic rheumatism as an alterative (see page 252).

Pilulæ Saponis cum Opio. — *Pills of Soap with Opium.*

℞ Opii duri contriti unciam dimidiam,
Saponis duri uncias duas;
Simul contunde, donec corpus unum sit.

Take of Hard Opium in powder, half an ounce,
Hard Soap, two ounces;
Beat them together until incorporated.

Five grains of this pill mass contain one grain of opium. The addition of the soap enables the pills, though long kept, to retain their solubility in the stomach; and the formula is only useful under such circumstances, or where it is desired to subdivide the dose of opium into very small portions.

Pilulæ Scillæ Compositæ. — *Compound Squill Pills.*

℞ Scillæ Radicis recèns exsiccatæ et contritæ drachmam,
Zingiberis Radicis contritæ,
Saponis duri, singulorum drachmas tres,
Ammoniaci contriti drachmas duas;
Misce inter se pulveres; deinde cum Sapone contunde, et adjice Syrupi simplicis quantum satis sit, ut idonea fiat crassitudo.

Take of Squill Root fresh dried and in powder, a drachm,
Ginger Root in powder,
Hard Soap, of each three drachms,
Ammoniacum in powder, two drachms;
Mix the powders; then beat them with the Soap, and add as much simple Syrup as may be sufficient to give a proper consistency.

From three to ten grains of this pill is given for a dose where stimulating expectorants are indicated, but the formula

might, without inconvenience, have been left for extemporaneous prescription.

Four grains of the above pill, with half a grain of calomel and half a grain of digitalis, is not unfrequently prescribed as a diuretic in dropsical affections; and it admits of a variety of other useful combinations.

I have not found this pill sensibly deteriorated by keeping for two years; but squill should always be used as freshly powdered as possible.

PREPARATIONS OF ANIMAL SUBSTANCES.

The remarks upon the following preparations under their respective titles in the "Materia Medica," render any further observations superfluous in this place. It may, however, be stated in respect to lard, that it frequently contains in the state in which it is usually sold and employed, namely, run into bladders, so large a portion of salt as to be unfit for its pharmaceutical applications until it has been washed; and that its fusion, as well as that of suet, should be effected by the heat of a water-bath or of steam.

Adeps Præparata.

Adipem in frustula concide; tum leni igne liquefactam per linteum exprime.

Prepared Lard.

Cut the Lard into small pieces; and having melted it over a slow fire, press it through a linen cloth.

Cornu Ustum.

Cornuum frusta igne aperto ure, donec penitùs albescant; deinde contere, et præpara eodem modo, quo de Creta præceptum est.

Calcined Hartshorn.

Calcine pieces of hartshorn in an open fire, till they are thoroughly white; then rub them into powder, and prepare them in the manner directed for Chalk.

Sevum Præparatum.

Sevum in frustula concide, tum leni igne liquefactum per linteum exprime.

Prepared Suet.

Cut the Suet into small pieces; then, having melted it over a slow fire, press it through a linen cloth.

Spongia Usta.

Spongiam in frustula concide, et contunde, ut à rebus alienis adhærentibus separetur; tum in vase ferreo clauso ure, donec nigra et friabilis fiat; denique in pulverem subtilissimum tere.

Burnt Sponge.

Cut the Sponge into small pieces, and beat it so as to separate from it adhering extraneous matters; then, burn it in a covered iron vessel until it becomes black and friable; lastly, rub it to a very fine powder.

Testæ Præparatæ.

Testas, sordibus priùs purgatas, aquâ fervente lava; tum præpara eodem modo, quo de Creta præceptum est.

Prepared Oyster Shells.

Having freed the shells from extraneous matters, wash them with boiling water; then prepare them in the manner directed for Chalk.

PLASTERS.

The term *plaster* is now applied to a variety of adhesive compounds limited to external use; they are generally spread, by the aid of heat, upon leather, linen, calico, or silk; and in this operation care should be taken that the compositions are injured as little as possible by the necessary application of heat.

Plasters are frequently resorted to as mere mechanical supports, and in this character they often effect most essential service; indeed, one of the greatest improvements in modern surgery consists in healing ulcers by the application of strips of adhesive plaster and bandages, so as to support the surrounding parts, and bring the edges of the sore gradually together.

Sometimes plasters are beneficial in consequence of the warmth which they afford as a mere covering to the part; and they are occasionally used as stimulants, rubefacients, and vesicants; and sometimes sedative substances are thus applied to allay pain and irritation, by their soothing effect upon the cuticular nerves.

Emplastrum Ammoniaci. — *Plaster of Ammoniacum.*

℞ Ammoniaci purificati uncias quinque,

Acidi acetici diluti octarium dimidium;

Liqua Ammoniacum in Acido; dein liquorem, in vase ferreo, balneo aquoso consume, assiduè movens, donec idonea fiat crassitudo.

Take of Purified Ammoniacum, five ounces,

Diluted acetic Acid, half a pint;

Liquefy the Ammoniacum in the Acid; then evaporate the liquor in an iron vessel placed in a water-bath, constantly stirring until it acquires a proper consistency.

This plaster is sometimes applied to indolent tumours as a stimulant and discutient, but a better method of using the ammoniacum is pointed out at page 20; and by employing strong acetic acid, diluted with its bulk of water, instead of the weaker distilled vinegar, a more effective application as a stimulant and a more adhesive plaster is obtained. It is best applied upon very coarse and thick linen.

Emplastrum Ammoniaci cum Hydrargyro. — *Plaster of Ammoniacum with Mercury.*

℞ Ammoniaci purificati libram,

Hydrargyri purificati uncias tres,

Olei sulphurati fluidrachmam;

Hydrargyrum cum Oleo sulphurato

Take of Purified Ammoniacum, a pound,

Purified Mercury, three ounces,

Sulphurated Oil, a fluid drachm;

Rub the Mercury with the sul-

tere, donec globuli non ampliùs conspiciantur; deinde paulatim adjice Ammoniacum liquefactum, et omnia misce.

phurated Oil until globules are no longer visible; then, by degrees, add the melted Ammoniacum, and mix.

The mercury contained in this plaster is supposed to increase its power of stimulating the absorbent vessels. It is commonly resorted to in cases of indolent glandular tumours, and is spread upon leather.

Emplastrum Cantharidis.

℞ Cantharidis in pulverem subtilissimum tritæ libram,
Emplastri Ceræ libram cum semisse,
Adipis præparatæ libram dimidiam;

Emplastro et Adipi simul liquefactis, et ab igne remotis, paulo antequam concrescant, Cantharidem insperge, atque omnia misce.

Plaster of Spanish Flies.

Take of Spanish Flies in very fine powder, a pound,
Wax Plaster, a pound and a half,
Prepared Lard, half a pound;

Having melted the Plaster and the Lard together, and removed them from the fire, just before they concrete, sprinkle in the Spanish Flies, and mix.

The uses of this plaster, and the best modes of applying it, have already been discussed under the article "Cantharides," in the Materia Medica (see page 48). It is generally spread upon leather, and should not be too thickly laid on. It is curious that when the flies are very finely powdered, the plaster is much less effective in raising a blister than when in a coarser state. It may be kept for many years without any loss of power.

Emplastrum Ceræ.

℞ Ceræ flavæ,
Sevi præparati, singulorum libras tres,
Resinæ flavæ libram;

Liquefac simul, et cola.

Wax Plaster.

Take of Yellow Wax,
Prepared Suet, of each three pounds,
Yellow Resin, a pound;

Melt them together, and strain.

Very thinly spread upon fine linen, or thin calico, this plaster furnishes a good application to vesicated surfaces, with a view of preventing external friction, and suffering the part to heal. It is scarcely otherwise employed.

Emplastrum Cumini.

℞ Cumini Seminum,
Carui Seminum,
Lauri Baccarum, singulorum uncias tres,
Picis Abietinæ libras tres,
Ceræ flavæ uncias tres,
Olivæ Olei,
Aquæ, singulorum fluidunciam cum semisse;

Pici et Ceræ simul liquefactis arida in pulverem trita, Oleum Olivæ, et Aquam adjice; tum ad idoneam crassitudinem decoque.

Cumin Plaster.

Take of Cumin Seeds,
Caraway Seeds,
Bay Berries, of each three ounces,
Burgundy Pitch, three pounds,
Yellow Wax, three ounces,
Olive Oil,
Water, of each an ounce and a half;

Having melted the Pitch and Wax together, add the dry materials reduced to powder, and then the Olive Oil and the Water; lastly, evaporate until the whole acquires a proper consistence.

This plaster is a relic of the old school, and is sometimes applied, spread upon leather, to the region of the stomach and to the abdomen, to allay spasm and flatulency. Where mere warmth is required, it may possibly prove of some little use; but plasters are now rarely applied with such intentions, and if the essential oils and other warm carminatives possess any efficacy in this way, it is merely as external stimulants.

Emplastrum Galbani Compositum.

℞ Galbani Gummi-resinæ purificatæ uncias octo,

Compound Galbanum Plaster.

Take of purified Galbanum Gum-resin, eight ounces,

Emplastri Plumbi libras tres,
Terebinthinæ vulgaris drachmas decem,
Abietis Resinæ contritæ uncias tres;

Galbani Gummi-resinæ et Terebinthinæ simul liquefactis, adjice primò Abietis Resinam, deinde Emplastrum Plumbi lento igne liquefactum, atque omnia misce.

Lead Plaster, three pounds,
Common Turpentine, ten drachms,
Resin of the Spruce Fir in powder, three ounces;

Having melted together the Galbanum and the Turpentine, add first the Resin and then the Lead Plaster, previously melted by a gentle heat, and mix all together.

No specific virtue can be supposed to be imparted to this plaster by the galbanum.

Emplastrum Hydrargyri. — *Plaster of Mercury.*

℞ Hydrargyri purificati uncias tres,
Olei sulphurati fluidrachmam,
Emplastri Plumbi libram;

Hydrargyrum cum Oleo sulphurato tere, donec globuli non ampliùs conspiciantur; tum paulatim adjice Emplastrum Plumbi liquefactum, atque omnia misce.

Take of Purified Mercury, three ounces,
Sulphurated Oil, a fluid drachm,
Lead Plaster, a pound;

Rub the Mercury with the sulphurated Oil until globules are no longer visible; then add, by degrees, the melted Plaster of Lead, and mix them all.

These sulphuretted combinations of mercury are probably of very little avail as external applications; and although the above plaster is thought to derive some discutient efficacy or power over the absorbents from its metallic ingredient, its power in those respects is very doubtful. It is applied, upon linen or leather, to tumours and indurations supposed to be connected with syphilis.

Emplastrum Opii. — *Plaster of Opium.*

℞ Opii duri contriti unciam dimidiam,

Take of hard Opium in powder, half an ounce,

Abietis Resinæ contritæ uncias tres,
Emplastri Plumbi libram,
Aquæ octarium dimidium;

Emplastro liquefacto Abietis Resinam, Opium, et Aquam adjice, et lento igne decoque, donec omnia in emplastri crassitudinem coëant.

Resin of the Spruce Fir in powder, three ounces,
Lead Plaster, a pound,
Water, half a pint;

To the melted Plaster add the Resin, the Opium and the Water, and evaporate by a slow fire until the whole combines into the consistency of a plaster.

As an external application, the uses of opium have already been adverted to at page 132, and sometimes the above plaster seems to act as a gentle anodyne, but its virtues are very equivocal. In cases where such applications are required, henbane or belladonna furnish less exceptionable resources, especially the latter.—(See page 41.)

Emplastrum Picis Compositum.

℞ Picis Abietinæ libras duas,
Abietis Resinæ libram,

Resinæ flavæ,
Ceræ flavæ, singulorum uncias quatuor,
Myristicæ Olei expressi unciam,

Olivæ Olei,
Aquæ, singulorum fluiduncias duas;

Pici, Resinæ, et Ceræ, simul liquefactis, primum Abietis Resinam, dein Oleum Myristicæ, Oleum Olivæ, et Aquam adjice. Denique omnia misce, et ad idoneam crassitudinem decoque.

Compound Plaster of Pitch.

Take of Burgundy Pitch, two pounds,
Resin of the Spruce Fir, a pound,
Yellow Resin,
Yellow Wax, of each four ounces,
Expressed Oil of Nutmegs, an ounce,
Olive Oil,
Water, of each two fluid ounces;

To the Pitch, the Resin, and the Wax melted together, add first the Resin of the Spruce Fir, then the Oil of Nutmegs, the Olive Oil, and the Water. Lastly, mix them all, and evaporate until they acquire a proper consistency.

The multitude of resins in this plaster is of little avail; it is no better than wax plaster with the addition of oil of nutmeg, which confers upon it no efficacy.

Emplastrum Plumbi. — *Plaster of Lead.*

℞ Plumbi Oxydi semivitrei, in pulverem subtilissimum triti, libras quinque,
Olivæ Olei congium,
Aquæ octarios duos;

Coque simul lento igne, assiduè movens, donec Oleum et Plumbi Oxydum in emplastri crassitudinem coëant. Oportebit autem paululum Aquæ ferventis adjicere, si ea ferè omnis, quæ in principio adhibita est, ante finem coctionis fuerit absumpta.

Take of Semi-vitreous Oxide of Lead in very fine powder, five pounds,
Olive Oil, a gallon,
Water, two pints;

Boil them together over a gentle fire, constantly stirring them, until the Oil and Oxide of Lead unite so as to acquire the consistency of a plaster. If the water originally employed should have evaporated before the completion of the process, a little more boiling water must be added.

Water is added in this operation to keep down the temperature by its evaporation, and so to prevent any decomposition of the oil and of the oxide. The resulting plaster is a perfect combination of the two; a species of metallic soap. It is principally useful as the basis of, or as an adjunct to, other plasters, not having sufficient adhesiveness to be employed alone.

Emplastrum Resinæ. — *Plaster of Resin.*

℞ Resinæ flavæ libram dimidiam,
Emplastri Plumbi libras tres;

Emplastro Plumbi, lento igne liquefacto, Resinam contritam adjice, et misce.

Take of Yellow Resin, half a pound,
Plaster of Lead, three pounds;

To the Plaster of Lead, melted over a slow fire, add the Resin in powder, and mix.

This is common *adhesive plaster*, and is generally spread on linen or calico; the former, on account of its strength, being, perhaps, preferable where the plaster is chiefly required as a bandage, though it is more apt to peel off than when upon calico. It is frequently employed to form a margin to other plasters of a less adhesive nature. The only effect it produces is that of a gentle stimulant, which, however, does not interfere with its uses as a defensive and supporting application.

Emplastrum Saponis.

℞ Saponis duri concisi libram dimidiam,
Emplastri Plumbi libras tres;

Emplastro liquefacto Saponem admisce; tum ad idoneam crassitudinem decoque.

Soap Plaster.

Take of Hard Soap sliced, half a pound,
Plaster of Lead, three pounds;

Mix the Soap with the melted Plaster; then boil them down till they acquire a proper consistence.

There is no sufficient advantage derived from this addition of soap to common plaster, to justify its being retained in the Pharmacopœia.

CERATES.

These are compounds containing wax and oil, of a soft consistency, so as to admit of being spread upon lint or linen without the aid of heat, yet not so soft as *ointments*. They are chiefly employed as applications to ulcerating and abraded surfaces, and were formerly used in much greater variety than at present, when it was more the custom to employ greasy applications in healing sores, and in the treatment of burns and other injuries.

Both the cerates and the ointments, but especially the latter, should have been left, as far as possible, to extemporaneous

prescription, for they mostly become rancid and sour when kept, acquiring a very disagreeable smell, and with it new properties. The list of them in the present Pharmacopœia is unnecessarily numerous; and accordingly those which are not in constant use almost always occur in a rancid state. All dressings with cerates or ointments should be renewed at least once a day, and in many cases oftener.

Ceratum Calaminæ.

℞ Calaminæ præparatæ,
Ceræ flavæ, singulorum libram dimidiam,
Olivæ Olei octarium;

Oleum cum Cera liquefacta misce; tum ab igne remove, et, ubi primum lentescant Calaminam adjice, et assiduè move, donec refrixerint.

Cerate of Calamine.

Take of prepared Calamine,
Yellow Wax, of each half a pound,
Olive Oil, a pint;

Mix the Oil with the melted Wax; then remove them from the fire, and when they begin to thicken add the Calamine, and stir constantly until they cool.

This is the once celebrated *Turner's Cerate*, so frequently resorted to as a soothing application to irritable sores and to scalded or burnt surfaces. It has now much fallen into disuse; and indeed, in the form of ointment, calamine cannot have much efficacy: of its occasional value in the treatment of ulcers, we have spoken at page 44.

Ceratum Cantharidis.

℞ Cantharidis in pulverem subtilissimum tritæ drachmam,
Cerati Cetacei drachmas sex;

Cerato, igne emollito, Cantharidem adjice, et misce.

Cerate of Spanish Flies.

Take of Spanish Flies in very fine powder, a drachm,
Spermaceti Cerate, six drachms;

To the Cerate, softened by the fire, add the Flies, and mix

The chief intention of this cerate is to keep up a continued discharge from a blistered surface; but it is apt to occasion strangury and other mischief, especially where the urinary organs are liable to any occasional state of irritation: in general, therefore, other stimulating applications should be preferred.

Ceratum Cetacei.

℞ Cetacei unciam dimidiam,
Ceræ albæ uncias duas,
Olivæ Olei fluiduncias quatuor;

Cetaceo et Ceræ simul liquefactis Oleum adjice, et spathâ ligneâ move, donec refrixerint.

Spermaceti Cerate.

Take of Spermaceti, half an ounce,
White Wax, two ounces,
Olive Oil, four fluid ounces;

To the Spermaceti and Wax, melted together, add the Oil, and stir them with a wooden spatula until cold.

This is employed, spread upon lint, as a cooling inactive dressing. Spread upon fine calico, and held to the fire so as to melt it, it is sometimes used to dress blisters with, under the name of *sparadrap*.

Ceratum Plumbi Acetatis.

℞ Plumbi Acetatis contritæ .....
drachmas duas,
Ceræ albæ uncias duas,
Olivæ Olei octarium dimidium;

Ceram in Olei fluidunciis septem liqua; tum his adjice paulatim Plumbi Acetatem, cum reliquo Oleo separatim contritam, et spathâ ligneâ move, donec coïerint.

Cerate of Acetate of Lead.

Take of Acetate of Lead in powder,
two drachms,
White Wax, two ounces,
Olive Oil, half a pint;

Dissolve the Wax in seven fluid ounces of the Oil; to these add, by degrees, the Acetate of Lead previously rubbed with the rest of the Oil, and stir with a wooden spatula until they are incorporated.

Acetate of lead, thus applied in the form of a cerate, soothes excoriated surfaces, and allays the pain occasioned by

moderate burns and scalds; but there is some mutual action of the oil upon the salt, which renders it less effective when long kept.

Ceratum Plumbi Compositum.

℞ Liquoris Plumbi Subacetatis fluiduncias duas cum semisse,
Ceræ flavæ uncias quatuor,
Olivæ Olei fluiduncias novem,
Camphoræ drachmam dimidiam;

Ceram liquefactam cum Olei fluidunciis octo misce; tum ab igne remove, et ubi primùm lentescant, Liquorem Plumbi Subacetatis paulatim adjice, et assiduè move spathâ ligneâ, donec refrixerint; denique cum his Camphoram, in reliquo Oleo liquatam, misce.

Compound Lead Cerate.

Take of Solution of Subacetate of Lead, two fluid ounces and a half,
Yellow Wax, four ounces,
Olive Oil, nine fluid ounces,
Camphor, half a drachm;

Mix the melted Wax with eight fluid ounces of the Oil; then remove them from the fire, and when they begin to thicken, gradually add the Solution of Subacetate of Lead, constantly stirring them with a wooden spatula until they become cold; lastly, mix the Camphor with them, dissolved in the remainder of the Oil.

Under the name of *Goulard's Cerate*, an application of this kind has long been used in the same cases as the preceding preparation. The camphor is not, in most cases, a desirable addition; and an extemporaneous compound, made by adding a few drops of the solution of subacetate of lead to spermaceti ointment, may aways be used as a substitute.

Ceratum Resinæ.

℞ Resinæ flavæ,
Ceræ flavæ, singulorum libram,
Olivæ Olei octarium;

Resin Cerate.

Take of Yellow Resin,
Yellow Wax, of each a pound,
Olive Oil, a pint;

Resinam et Ceram lento igne simul liquefac; dein Oleum adjice, et Ceratum adhuc calens per linteum exprime.

Melt the Resin and Wax together over a gentle fire; then add the Oil, and whilst the Cerate is hot strain it through linen.

This is a slightly stimulating cerate, nearly corresponding with the *yellow digestive* of old pharmacy. It is commonly used as a dressing for ulcerating sores.

Ceratum Sabinæ. — *Savine Cerate.*

℞ Sabinæ Foliorum recentium contusorum libram,
Ceræ flavæ libram dimidiam,
Adipis præparatæ libras duas;

Adipi et Ceræ simul liquefactis Sabinæ Folia incoque; tum per linteum exprime.

Take of fresh Savine Leaves bruised, a pound,
Yellow Wax, half a pound,
Prepared Lard, two pounds;

With the Wax and Lard melted together boil the Savine Leaves, then strain through a linen cloth.

This is an excellent stimulating application for the purpose of keeping up a discharge from a recently blistered surface; but unless carefully prepared, and fresh, it is apt to be deficient in acrimony. It should be of a pale yellow-green colour, and smell strongly of the savine.

Ceratum Saponis. — *Soap Cerate.*

℞ Saponis duri uncias octo,
Ceræ flavæ uncias decem,
Plumbi Oxydi semivitrei contriti libram,
Olivæ Olei octarium,
Aceti congium;

Take of hard Soap, eight ounces,
Yellow Wax, ten ounces,
Semivitreous Oxide of Lead in powder, a pound,
Olive Oil, a pint,
Vinegar, a gallon;

Coque Acetum cum Plumbi Oxido, lento igne, assiduè movens, donec in unum coëant; dein adjice Saponem, et iterùm simili modo coque, donec humor penitùs consumptus fuerit; denique cum his Ceram, ex Oleo priùs liquefactam, misce.

Boil the Vinegar with the Oxyde of Lead over a slow fire, constantly stirring them until they incorporate; then add the Soap, and boil again in a similar manner till the moisture is evaporated; lastly, mix these with the Wax, previously dissolved in the Oil.

Soap cerate derives its efficacy from the acetate of lead formed by boiling the litharge with the vinegar; it is a good cooling application, and, when hardened by boiling it for some time, so as to render it of a deep chocolate brown colour, it forms an excellent plaster, spread upon linen, and rendered somewhat more adhesive by the addition of a sufficient quantity of the *emplastrum resinæ*. It is one of the best soothing and softening applications to corns.

Ceratum Simplex. — *Simple Cerate.*

℞ Olivæ Olei fluiduncias quatuor,
Ceræ flavæ uncias quatuor;

Ceræ liquefactæ Oleum adjice, et misce.

Take of Olive Oil, four fluid ounces,
Yellow Wax, four ounces;

Add the Oil to the melted Wax, and mix.

Spermaceti cerate renders this a supernumerary; it is, however, less inclined to rancidity, and a good vehicle for some active applications.

OINTMENTS.

Ointments are of a softer consistency, and even more liable to become rancid than cerates, and wholly unfit for use when long kept. Most of them should, for this reason, have been consigned to extemporaneous prescription.

Unguentum Cantharidis. *Ointment of Spanish Flies.*

℞ Cantharidis in pulverem subtilissimum contritæ uncias duas,
Aquæ destillatæ fluiduncias octo,

Cerati Resinæ uncias octo;

Aquam cum Cantharide decoque ad dimidiam, et cola. Liquori colato immisce Ceratum; dein vaporet ad idoneam crassitudinem.

Take of Spanish Flies in very fine powder, two ounces,
Distilled Water, eight fluid ounces,
Resin Cerate, eight ounces;

Boil down the water with the Spanish Flies to one half, and strain. Mix the Cerate with the strained liquor, and evaporate the mixture until it acquires a proper consistence.

The object of this ointment is to furnish a mildly stimulating application to continue the discharge from blisters, without producing the well-known inconveniences of applying the fly in the form of powder: the application is, however, not to be depended upon, for nearly the whole of the acrimony of the insect appears to be destroyed by the process of decoction.

Unguentum Cetacei. *Spermaceti Ointment.*

℞ Cetacei drachmas sex,
Ceræ albæ drachmas duas,
Olivæ Olei fluiduncias tres;

Lento igne simul liquefacta assiduè move donec refrixerint.

Take of Spermaceti, six drachms,
White Wax, two drachms,
Olive Oil, three fluid ounces;

Melt them together over a slow fire, stirring them constantly until cold.

This ointment should always be freshly prepared, as, in warm weather especially, it soon becomes rancid, and unfit for use as a dressing for vesications and excoriated surfaces, the purposes to which it is usually applied. A more elegant preparation is afforded by substituting almond for olive oil, but it is equally subject to rancidity.

Unguentum Elemi Compositum.

Compound Elemi Ointment.

℞ Elemi libram,
Terebinthinæ vulgaris uncias decem,
Sevi præparati libras duas,
Olivæ Olei fluiduncias duas;

Elemi cum Sevo simul liquefac; tum ab igne remove, et his Terebinthinam et Oleum statim misce; deinde per linteum exprime.

Take of Elemi, a pound,
Common Turpentine, ten ounces,
Prepared Suet, two pounds,
Olive Oil, two fluid ounces;

Melt the Elemi with the Suet, then remove them from the fire, and immediately mix with them the Turpentine and the Oil; lastly strain through linen.

The compound elemi ointment is the yellow basilicon of old pharmacy: it is used as a slightly stimulating application to issues and setons, and to healthy purulent surfaces, to promote their natural actions.

Unguentum Hydrargyri Fortius.

Strong Mercurial Ointment.

℞ Hydrargyri purificati libras duas,
Adipis præparatæ uncias viginti tres,
Sevi præparati unciam;

Tere primùm Hydrargyrum cum Sevo et exiguo Adipis, donec globuli non amplius conspiciantur; dein adjice Adipis quod reliquum est, et misce.

Take of purified Mercury, two pounds,
Prepared Lard, twenty-three ounces,
Prepared Suet, an ounce;

First rub the Mercury with the Suet and a little of the Lard, until globules are no longer visible; then add the remainder of the Lard, and mix.

Turpentine, sulphur, very rancid lard, and some other substances, are occasionally employed as substitutes for what is vulgarly called elbow-grease, in this important preparation. It is often, in warm weather especially, extremely difficult to incorporate the materials, but it unfortunately happens that any of the above surreptitious additions render the ointment irritating to the skin, and induce it to the production of an

eruption of small and painful pimples, which not unfrequently interfere with the continuance of the mercurial frictions. The apparatus mentioned under the article *Pilula Hydrargyri* is very successfully employed in the formation of this ointment.

Recently made mercurial ointment is of a bluish grey colour; and there can be little doubt that the metal in it is chiefly in the state of protoxide. Nothing is gained by substituting the protoxide for metallic mercury in this compound, as has sometimes been proposed.

It is frequently necessary to introduce mercury into the system through the medium of the superficial absorbents, and this is almost invariably effected by rubbing in from one to two drachms of the above ointment, every night, upon the inside of the thighs and upon the calves of the legs: its consequences must be carefully watched, and the quantity and repetition of the friction adjusted according to the salivation or other effects which are produced. Upon these subjects, and upon the general management of the patient, the reader is referred to the article "Hydrargyrum," in the list of the Materia Medica. The inunction should be performed by the patient himself, in a warm room or before the fire, till the ointment nearly disappears; and in case of irritation or eruption upon the skin, the place of friction should be varied. If the ointment fails of producing the desired effect, five grains of camphor added to each drachm will sometimes excite the absorbents to its reception. Mercurial frictions are rarely resorted to except in the venereal disease, in obstinate hepatic obstructions, and in some dropsical affections with a view to the general excitement of the absorbent system.

Unguentum Hydrargyri Mitius. — *Mild Mercurial Ointment.*

℞ Unguenti Hydrargyri fortioris libram,	Take of strong Mercurial Ointment, a pound,
Adipis præparatæ libras duas;	Prepared Lard, two pounds;
Misce.	Mix.

Syphilitic sores are sometimes dressed with this ointment, but the formula is superfluous.

Unguentum Hydrargyri Nitratis.

℞ Hydrargyri purificati unciam,
Acidi nitrici fluid drachmas undecim,

Adipis præparatæ uncias sex,
Olivæ Olei fluid uncias quatuor;

Hydrargyrum in Acido primùm liqua; dein liquorem adhuc calentem cum Adipe et Oleo, simul liquefactis, misce.

Ointment of Nitrate of Mercury.

Take of purified Mercury, an ounce,
Nitric Acid, eleven fluid drachms,
Prepared Lead, six ounces,
Olive Oil, four fluid ounces;

First dissolve the Mercury in the Acid; then, while the solution is hot, mix it with the Lard and Oil melted together.

This ointment is apt to become hard and brittle, in consequence of the action of the acid upon the lard; and a preferable compound is obtained when only half the quantity of that ingredient above prescribed is employed. It is a stimulating detergent ointment, singularly effective in many cutaneous eruptions, and often usefully applied to indolent sores. When diluted with spermaceti ointment or with prepared lard, the substances should be carefully liquefied in a water-bath. It is very successfully employed in the cure of purulent ophthalmia, and in the treatment of ulcerated eyelids, to which it should be applied, previously softened, upon a camel-hair pencil.

Unguentum Hydrargyri Nitrico-Oxydi.

℞ Hydrargyri Nitrico-oxydi unciam,

Ceræ albæ uncias duas,
Adipis præparatæ uncias sex;

Cere et Adipi, simul liquefactis,

Ointment of Nitrico-Oxide of Mercury.

Take of Nitrico-oxide of Mercury, an ounce,
White Wax, two ounces,
Prepared Lard, six ounces;

To the Wax and Lard, melted to-

adjice Hydrargyri Nitrico-oxydum in pulverem subtilissimum tritum, et misce.

gether, add the Nitrico-oxide of Mercury, reduced to a very subtile powder, and mix.

This ointment has already been mentioned at pages 97, 287, and 290: it is a powerful stimulant, and, independent of its application as such to indolent and unkindly ulcers and excoriations, is of use in conjunctival inflammation and opacity of the cornea. The utmost attention should be paid to the levigation of the nitrico-oxide. It is generally applied upon a piece of lint of the size of the sore, covered by another piece spread with spermaceti ointment.

Unguentum Hydrargyri Præcipitati Albi.

Ointment of White Precipitated Mercury.

℞ Hydrargyri præcipitati albi drachmam,
Adipis præparatæ unciam cum semisse;

Adipi, lento igne liquefactæ, adjice Hydrargyrum præcipitatum, et misce.

Take of White Precipitated Mercury, a drachm,
Prepared Lard, an ounce and a half;

To the Lard, melted over a slow fire, add the Precipitated Mercury, and mix.

There is no occasion for the fusion of the lard: the white precipitate should be rubbed to a very fine powder, and gradually mixed by trituration with the lard in its usual state. The ointment is often effectual in the relief of herpetic eruptions, and, when duly diluted with twice its weight of pomatum, may be employed to cure porrigo. It is very effective in the treatment of the itch, and in the destruction of vermin.

Unguentum Picis Nigræ.

Pitch Ointment.

℞ Picis nigræ,
Ceræ flaxæ,

Take of Pitch,
Yellow Wax,

Resinæ flavæ, singulorum uncias novem, Olivæ Olei octarium;	Yellow Resin, of each nine ounces, Olive Oil, a pint;
Liquefac simul, et per linteum exprime.	Melt them together, and strain through linen.

This is the least useful ointment of the Pharmacopœia.

Unguentum Picis Liquidæ. — *Tar Ointment.*

℞ Picis liquidæ, Sevi præparati, singulorum libram;	Take of Tar, Prepared Suet, of each a pound;
Liquefac simul, et per linteum exprime.	Melt them together, and strain through a linen cloth.

Tinea capitis is almost the only disease in which this ointment is employed with any advantage; but it admits of other more effectual and less disagreeable treatment.

Unguentum Sambuci. — *Elder Flower Ointment.*

℞ Sambuci Florum, Adipis præparatæ, singulorum libras duas;	Take of Elder Flowers, Prepared Lard, of each two pounds,
Adipi incoque Sambuci Flores, donec friabiles fiant; tum per linteum exprime.	Boil the Elder Flowers in the Lard until they become crisp; then strain through linen.

This ointment seems retained to remind us of the folly and inutility of many analogous preparations of herbs and flowers which were common in ancient pharmacy.

Unguentum Sulphuris.

℞ Sulphuris sublimati uncias tres,
Adipis præparatæ libram dimidiam;

Misce.

Sulphur Ointment.

Take of sublimed Sulphur, three ounces,
Prepared Lard, half a pound;

Mix.

This is a specific in the cure of itch; it is much improved by the addition of oil of lavender, and a little cinnabar is sometimes added to it to cover the colour of the brimstone. The following is a very effective application in the cure of *psora*, and somewhat more elegant than the above :—

℞ Sulphuris Præcipitati ℥j.
Unguenti Cetacei ℥viij.
Olei Lavandulæ,
—— Limonum, āā ℥j.

Tere simul ut fiat unguentum, partibus affectis nocte et mane applicandum.

Unguentum Sulphuris Compositum.

℞ Sulphuris sublimati libram dimidiam,
Veratri Radicis contritæ uncias duas,
Potassæ Nitratis drachmam,
Saponis mollis libram dimidiam,
Adipis præparatæ libram cum semisse;

Misce.

Compound Sulphur Ointment.

Take of sublimed Sulphur, half a pound,
White Hellebore Root in powder, two ounces,
Nitrate of Potassa, a drachm,
Soft Soap, half a pound,
Prepared Lard, a pound and a half;

Mix.

This is a coarse but effective application in the cure of itch, probably chiefly limited to hospital practice, for the

white hellebore is apt to prove mischievously irritating. It is a sovereign destroyer of lice.

Unguentum Veratri. — *White Hellebore Ointment.*

℞ Veratri Radicis contritæ uncias duas, Adipis præparatæ uncias octo, Limonum Olei minima viginti;	Take of White Hellebore Root in powder, two ounces, Prepared Lard, eight ounces, Oil of Lemons, twenty minims;
Misce.	Mix.

When the smell of sulphur is very objectionable, this ointment is intended to be resorted to in the cure of scabies; but the *unguentum hydrargyri præciptati albi* is, in such cases, a preferable substitute. At all events, white hellebore should be used with much circumspection, and never in the cases of children.

Unguentum Zinci. — *Zinc Ointment.*

℞ Zinci Oxydi unciam, Adipis præparatæ uncias sex;	Take of Oxide of Zinc, an ounce, Prepared Lard, six ounces;
Misce.	Mix.

The present mode of preparing oxide of zinc (see page 312), has much improved this ointment; it is, however, a compound of insufficient importance, and should have been left for extemporaneous prescription. It sometimes agrees well with the surface of sores, and tends to the healing of excoriated nipples; but, in the case of nurses, all applications likely to prove hurtful to the infant should, if possible, be superseded by innocuous stimulants and astringents, or by mechanical protection of the part.

LINIMENTS.

These preparations are fluid, or nearly so, and generally of a stimulating nature, so as to excite irritation upon the part rubbed, and to promote the actions of its absorbents. They are, with very few exceptions, of such a nature as to be better fitted for extemporaneous prescription than regular occupants of the Pharmacopœia.

Linimentum Æruginis.

℞ Æruginis contritæ unciam,
Aceti fluiduncias septem,
Mellis despumati uncias quatuordecim;

Liqua Æruginem in Aceto, et per linteum cola; dein, instillato Melle, ad idoneam crassitudinem decoque.

Liniment of Verdigris.

Take of Verdigris in powder, an ounce,
Vinegar, seven fluid ounces,
Clarified Honey, fourteen ounces;

Dissolve the Verdigris in the Vinegar, and strain the solution through linen; then, having gradually added the Honey, boil them down to proper consistence.

The term *liniment* is not very appropriately applied to this cupreous compound, the uses of which are mentioned at pages 13 and 75.

Linimentum Ammoniæ Fortius.

℞ Liquoris Ammoniæ fluidunciam,
Olivæ Olei fluiduncias duas;

Agita simul, donec misceantur.

Strong Liniment of Ammonia.

Take of Solution of Ammonia, a fluid ounce,
Olive Oil, two fluid ounces;

Shake them together until they are mixed.

This is an ammoniacal soap, of much use as a rubefacient and external stimulant in inflammatory sore throat and in chronic rheumatic affections of the joints.

Linimentum Ammoniæ Subcarbonatis.

℞ Liquoris Ammoniæ Subcarbonatis fluidunciam,
Olivæ Olei fluiduncias tres;
Agita simul, donec misceantur.

Liniment of Subcarbonate of Ammonia.

Take of Solution of Subcarbonate of Ammonia, a fluid ounce,
Olive Oil, three fluid ounces;
Shake them together until they unite.

This liniment is used in the same cases as the former, but is less active.

Linimentum Camphoræ.

℞ Camphoræ unciam dimidiam,
Olivæ Olei fluiduncias duas;
Liqua Camphoram in Oleo.

Camphor Liniment.

Take of Camphor, half an ounce,
Olive Oil, two fluid ounces;
Dissolve the Camphor in the Oil.

An oleaginous solution of camphor is often very effectual in the relief of chronic rheumatism, when diligently rubbed in upon the affected part; similarly applied it also occasionally leads to the dispersion of glandular tumours; the camphor may, no doubt, act as a stimulant upon the absorbents, but much of the benefit is referrible to the friction, which, in such cases, often alone does wonders. The above liniment is sometimes substituted with advantage for the pure olive oil in the *Linimentum Ammoniæ Fortius.*

Linimentum Camphoræ Compositum.

Compound Camphor Liniment.

℞ Camphoræ uncias duas,
Liquoris Ammoniæ fluiduncias sex,
Spiritûs Lavandulæ octarium;

Liquorem Ammoniæ cum Spiritu misce; tum ex retorta vitrea, lento igne, destillet octarius; denique in hoc liqua Camphoram.

Take of Camphor, two ounces,
Solution of Ammonia, six fluid ounces,
Spirit of Lavender, a pint;

Mix the Solution of Ammonia with the spirit; then, by the aid of a slow fire, distil one pint out of a glass retort; lastly, in this dissolve the Camphor.

This process, though unnecessarily circuitous, affords a very elegant and useful liniment, applicable in the same cases as the liniments of ammonia generally, but having the advantage of not being greasy: it may either be applied by friction or sprinkled upon flannel. Like all the stimulating liniments, it sometimes induces erysipelatous inflammation, which must of course be guarded against.

Linimentum Hydrargyri.

Mercurial Liniment.

℞ Unguenti Hydrargyri fortioris,
Adipis præparatæ, singulorum uncias quatuor,
Camphoræ unciam,
Spiritûs rectificati minima quindecim,
Liquoris Ammoniæ fluiduncias quatuor;

Camphoram primùm cum Spiritu tere, deinde cum Adipe et Unguento Hydrargyri; denique, instillato paulatim Liquore Ammoniæ, omnia misce.

Take of strong Mercurial Ointment,
Prepared Lard, of each four ounces,
Camphor, an ounce,
Rectified Spirit, fifteen minims,
Solution of Ammonia, four fluid ounces;

Rub the Camphor, first with the Spirit, then with the Lard and Ointment; lastly, gradually add the Solution of Ammonia, and mix.

This stimulating mercurial liniment will sometimes assist

the removal of obstinate glandular tumours, especially those derived from venereal sources. In its employment, its tendency to excite salivation, which, in some constitutions, is extremely energetic, must not be lost sight of.

Linimentum Saponis Compositum.

℞ Saponis duri uncias tres,
Camphoræ unciam,
Spiritûs Rosmarini octarium;

Liqua Camphoram in Spiritu; dein Saponem adjice, et macera balneo arenæ, donec liquetur.

Compound Soap Liniment.

Take of hard Soap, three ounces,
Camphor, an ounce,
Spirit of Rosemary, a pint;

Dissolve the Camphor in the Spirit, then add the Soap, and macerate them in a sand-bath until it is dissolved.

This is an excellent liniment in all common rheumatic affections and local pains: the soap prevents its rapidly drying upon the part, the camphor and spirit stimulate, and the oil of rosemary gives it an agreeable odour. It is a good addition to other liniments; mixed with tincture of cantharides it is rendered more effectively stimulating and rubefacient; and with the addition of tincture of opium it forms one of the best sedative liniments.

In paralytic and chronic rheumatic cases the following may be prescribed as a stimulating liniment:—

℞ Tincturæ Cantharidis,
Linimenti Saponis compositi, āā f℥j.
Fiat linimentum rubefaciens.

Or,—

℞ Linimenti Camphoræ compositi,
Linimenti Saponis compositi,
Olei Cajuputi, āā f℥j.
Fiat linimentum stimulans.

The following are the usually prescribed sedative liniments :—

℞ Tincturæ Opii f℥j.
Linimenti Camphoræ compositi f℥ij.
Fiat linimentum anodynum.

℞ Tincturæ Opii f℥j.
Linimenti Saponis compositi f℥iij.
M. ft. linimentum opiatum.

Linimentum Terebinthinæ. *Turpentine Liniment.*

℞ Cerati Resinæ libram, Olei Terebinthinæ octarium dimidium ;	Take of Resin Cerate, a pound, Oil of Turpentine, half a pint ;
Liquefacto Cerato Oleum Terebinthinæ adjice, et misce.	Add the Oil of Turpentine to the melted Cerate, and mix.

The chief intention of this liniment is as an application to extensive burns and scalds (see page 336); but oil of turpentine is a good stimulant in other forms of prescription, and often appears to excite the absorbents and stimulate the nerves of a part where other irritants fail: hence the occasional advantage of one or other of the following formulæ in paralytic affections and certain cases of rheumatism; these liniments should be well shaken when required for use.

℞ Tincturæ Cantharidis,
Olei Terebinthinæ rectificati,
Linimenti Camphoræ, āā f℥j.
Fiat linimentum.

℞ Olei Terebinthinæ rectificati,
Olei Olivæ,
Liquoris Ammoniæ,
Tincturæ Opii,
Linimenti Saponis compositi, āā f℥ss.
Fiat linimentum.

CATAPLASMS.

The preparation of poultices is generally the business of the nurse: they are mostly intended to aid the natural functions of a part, by keeping it warm and moist; or to soothe pain and allay irritation. Of the two following formulæ, the first is sometimes used to correct the fetid discharge of ill-conditioned ulcers: its efficacy is probably referrible to the evolution of carbonic acid.

The mustard poultice is a powerfully stimulating application; and in apoplectic cases, in certain stages of typhus fever, and generally where there is determination of blood to the head, it is sometimes applied to the calves of the legs and to the soles of the feet, with a view of causing a revulsion, or counteraction in a distant part; but the practice is not worth much.

Cataplasma Fermenti.

℞ Farinæ libram,
Cerevisiæ Fermenti octarium dimidium;

Misce, et calorem lenem adhibe, donec intumere cœperint.

Yest Cataplasm.

Take of Flour, a pound,
Yest, half a pint;

Mix, and expose it to a gentle heat till it begins to rise.

Cataplasma Sinapis.

℞ Sinapis Seminum,
Lini usitatissimi Seminum, singulorum contritorum libram dimidiam,
Aceti calidi quantum satis sit;

Misce, ut fiat Cataplasmatis crassitudo.

Mustard Cataplasm.

Take of Mustard Seed,
Linseed, of each in powder half a pound,

Hot Vinegar, a sufficient quantity;

Mix, so as to form a Poultice.

TABLE

SHOWING IN WHAT PROPORTION OPIUM AND CERTAIN PREPARATIONS OF ANTIMONY, ARSENIC, AND MERCURY, ARE CONTAINED IN SOME COMPOUND MEDICINES.

CONFECTIO OPII (*Confection of Opium*), in about thirty-six grains contains one grain of opium.

HYDRARGYRUM CUM CRETA (*Mercury with Chalk*), in about three grains contains one grain of mercury.

LINIMENTUM HYDRARGYRI (*Mercurial Liniment*), in about six drachms contains one drachm of mercury.

LIQUOR ARSENICALIS (*Arsenical Solution*), in two fluid drachms contains one grain of sublimed white arsenic.

LIQUOR HYDRARGYRI OXYMURIATIS (*Solution of Oxymuriate of Mercury*), in two fluid ounces contains one grain of oxymuriate of mercury.

PILULÆ HYDRARGYRI (*Mercurial Pills*), in three grains contain one grain of mercury.

PILULÆ HYDRARGYRI SUBMURIATIS COMPOSITÆ (*Compound Pills of Submuriate of Mercury*), in about four grains contain one grain of submuriate of mercury.

PILULÆ SAPONIS CUM OPIO (*Soap Pills with Opium*), in five grains contain one grain of opium.

PULVIS CORNU USTI CUM OPIO (*Powder of Calcined Hartshorn with Opium*), in ten grains contains one grain of opium.

PULVIS CRETÆ COMPOSITUS CUM OPIO (*Compound Powder of Chalk with Opium*), in two scruples contains one grain of opium.

PULVIS IPECACUANHÆ COMPOSITUS (*Compound Powder of Ipecacuanha*), in ten grains contains one grain of opium.

PULVIS KINO COMPOSITUS (*Compound Powder of Kino*), in one scruple contains one grain of opium.

VINUM ANTIMONII TARTARIZATI (*Wine of tartarized Antimony*), in four fluid drachms contains one grain of tartarized antimony.

UNGUENTUM HYDRARGYRI FORTIUS (*Stronger Mercurial Ointment*), in two drachms contains one drachm of mercury.

UNGUENTUM HYDRARGYRI MITIUS (*Milder Mercurial Ointment*), in six drachms contains one drachm of mercury.

A TABLE

OF

PHARMACEUTICAL EQUIVALENTS.

Acid, Acetic (dry)	4 Carbon	(6×4)	= 24	50
	3 Oxygen	(8×3)	= 24	
	2 Hydrogen		= 2	
.. .. (crystallised or glacial)	1 Dry Acid		= 50	59
	1 Water		= 9	
.. Arsenious (dry)	1 Arsenic		= 38	54
	2 Oxygen	(8×2)	= 16	
.. Benzoic (dry)	15 Carbon	(6×15)	= 90	120
	3 Oxygen	(8×3)	= 24	
	6 Hydrogen		= 6	
.. Boracic (dry)	1 Boron		= 6	22
	2 Oxygen	(8×2)	= 16	
.. .. (crystallised)	1 Dry Acid		= 22	40
	2 Water	(9×2)	= 18	
.. Carbonic (dry)	1 Carbon		= 6	22
	2 Oxygen	(8×2)	= 16	
.. Citric (dry)	4 Carbon	(6×4)	= 24	58
	4 Oxygen	(8×4)	= 32	
	2 Hydrogen		= 2	
.. .. (crystallised)	1 Dry Acid		= 58	76
	2 Water	(9×2)	= 18	
.. Hydriodic (dry)	1 Iodine		= 125	126
	1 Hydrogen		= 1	
.. Hydrocyanic (dry)	1 Cyanogen		= 26	27
	1 Hydrogen		= 1	
.. Muriatic (dry)	1 Chlorine		= 36	37
	1 Hydrogen		= 1	
.. Nitric (dry)	1 Nitrogen		= 14	54
	5 Oxygen	(8×5)	= 40	
.. .. (liquid, sp. gr. 1.5)	1 Dry Acid		= 54	72
	2 Water	(9×2)	= 18	
.. Oxalic (dry)	2 Carbon	(6×2)	= 12	36
	3 Oxygen	(8×3)	= 24	
.. .. (crystallised)	1 Dry Acid		= 36	72
	4 Water	(4×9)	= 36	
.. Phosphoric (dry)	1 Phosphorus		= 12	28
	2 Oxygen	(8×2)	= 16	
.. Succinic (dry, or anhydrous crystals)	4 Carbon	(6×4)	= 24	51
	3 Oxygen	(8×3)	= 24	
	3 Hydrogen		= 3	
.. Sulphuric (dry)	1 Sulphur		= 16	40
	3 Oxygen	(8×3)	= 24	
.. .. (liquid, sp. gr. 1.48)	1 Dry Acid		= 40	49
	1 Water		= 9	

Acid, Tartaric (dry)	4 Carbon	(6×4)	= 24	67
	5 Oxygen	(8×5)	= 40	
	3 Hydrogen		= 3	
.. .. (crystallised)	1 Dry Acid		= 67	76
	1 Water		= 9	
Alum (dry)	2 Sulphate of Alumina	(66×2)	= 132	260
	1 Bisulphate of Potassa		= 128	
.. (crystallised)	1 Dry Alum		= 260	485
	25 Water	(9×25)	= 225	
Alumina	1 Aluminum		= 18	26
	1 Oxygen		= 8	
.. Sulphate (dry)	1 Alumina		= 26	66
	1 Sulphuric Acid		= 40	
Ammonia	1 Nitrogen		= 14	17
	3 Hydrogen		= 3	
.. Acetate (dry)	1 Ammonia		= 17	67
	1 Acetic Acid		= 50	
.. Hydrated Bicarbonate	1 Ammonia		= 17	79
	2 Carbonic Acid	(22×2)	= 44	
	2 Water	(9×2)	= 18	
.. Carbonate	1 Ammonia		= 17	39
	1 Carbonic Acid		= 22	
.. Hydrated Sesquicarbonate	2 Ammonia	(17×2)	= 34	118
	3 Carbonic Acid	(22×3)	= 66	
	2 Water	(9×2)	= 18	
.. Citrate (dry)	1 Ammonia		= 17	75
	1 Citric Acid		= 58	
.. Muriate	1 Ammonia		= 17	54
	1 Muriatic Acid		= 37	
.. Sulphate (hydrated)	1 Ammonia		= 17	66
	1 Sulphuric Acid		= 40	
	1 Water		= 9	
Antimony				45
.. Chloride	1 Antimony		= 45	81
	1 Chlorine		= 36	
.. Protoxide	1 Antimony		= 45	53
	1 Oxygen		= 8	
.. Protoxide, Hydrosulphuret of	1 Protoxide of Antimony		= 53	86
	1 Bisulphuret of Hydrogen		= 33	
.. Peroxide	1 Antimony		= 45	61
	2 Oxygen	(8×2)	= 16	
.. Sulphuret	1 Antimony		= 45	61
	1 Sulphur		= 16	
.. Potassa Tartrate *	3 Protoxide of Antimony	(53×3)	= 159	341
	1 Bitartrate of Potassa		= 182	
Arsenic				38
.. Oxide (Arsenious Acid)	1 Arsenic		= 38	54
	2 Oxygen		= 16	
Bismuth				71

* According to Mr. R. Phillips: in the text, at page 254, the quantity of Protoxide is underrated by one proportional.

Bismuth, Oxide	1 Bismuth = 71 1 Oxygen = 8		79
.. Subnitrate	2 Oxide of Bismuth (79×2) = 158 1 Nitric Acid = 54		212?
Boron			6?
Calcium			20
.. Chloride	1 Calcium = 20 1 Chlorine = 36		56
.. Oxide (see *Lime*)	1 Calcium = 20 1 Oxygen = 8		28
Carbon			6
Carburet of Nitrogen (Cyanogen)	2 Carbon (6×2) = 12 1 Nitrogen = 14		26
Chlorine			36
Cinchonia			315
Copper			64
.. Subperacetate (dry)	1 Peroxide of Copper = 80 1 Acetic Acid = 50		130
.. .. (crystallised common verdigris)	1 Subperacetate = 130 6 Water (9×6) = 54		184
.. Peracetate (dry)	1 Peroxide of Copper = 80 2 Acetic Acid (50×2) = 100		180
.. .. (crystallised or distilled verdigris)	1 Peracetate = 180 3 Water (9×3) = 27		207
.. Peroxide	1 Copper = 64 2 Oxygen (8×2) = 16		80
.. Persulphate (dry)	1 Peroxide of Copper = 80 2 Sulphuric Acid (40×2) = 80		160
.. .. (crystallised)	1 Persulphate of Copper = 160 10 Water (9×10) = 90		250
Hydrogen			1
Iodine			125
Iron			28
.. Protoxide	1 Iron = 28 1 Oxygen = 8		36
.. Peroxide	1 Iron = 28 1½ Oxygen = 12		40
.. Perchloride	1 Iron = 28 1½ Chlorine = 54		82
.. Sulphate (dry)	1 Protoxide of Iron = 36 1 Sulphuric Acid = 40		76
.. .. (crystallised)	1 Dry Sulphate = 76 7 Water (9×7) = 63		139
Lead			104
.. Acetate (dry)	1 Protoxide of Lead = 112 1 Acetic Acid = 50		162
.. .. (crystallised)	1 Dry Acetate = 162 3 Water (9×3) = 27		189
.. Subacetate	2 Protoxide of Lead (112×2) = 224 1 Acetic Acid = 50		274

Lead, Protoxide	1 Lead	= 104	112
	1 Oxygen	= 8	
.. Carbonate	1 Protoxide of Lead	= 112	134
	1 Carbonic Acid	= 22	
Lime	1 Calcium	= 20	28
	1 Oxygen	= 8	
.. Carbonate	1 Lime	= 28	50
	1 Carbonic Acid	= 22	
.. Hydrate (slaked lime)	1 Lime	= 28	37
	1 Water	= 9	
.. Phosphate	1 Lime	= 28	56
	1 Phosphoric Acid	= 28	
.. Sulphate (dry)	1 Lime	= 28	68
	1 Sulphuric Acid	= 40	
.. Tartrate (dry)	1 Lime	= 28	95
	1 Tartaric Acid	= 67	
Magnesia	1 Magnesium	= 12	20
	1 Oxygen	= 8	
.. Carbonate (dry)	1 Magnesia	= 20	42
	1 Carbonic Acid	= 22	
.. Sulphate (dry)	1 Magnesia	= 20	60
	1 Sulphuric Acid	= 40	
.. .. (crystallised)	1 Dry Sulphate	= 60	123
	7 Water	(9×7) = 63	
Mercury			200
.. Protoxide	1 Mercury	= 200	208
	1 Oxygen	= 8	
.. Peroxide	1 Mercury	= 200	216
	2 Oxygen	(8×2) = 16	
.. Protochloride (Calomel)	1 Mercury	= 200	236
	1 Chlorine	= 36	
.. Perchloride (Corrosive Sublimate)	1 Mercury	= 200	272
	2 Chlorine	(36×2) = 72	
.. Protosulphate (dry)	1 Protoxide of Mercury	= 208	248
	1 Sulphuric Acid	= 40	
.. Persulphate (dry)	1 Peroxide of Mercury	= 216	296
	2 Sulphuric Acid	(40×2) = 80	
.. Protosulphuret	1 Mercury	= 200	216
	1 Sulphur	= 16	
.. Bisulphuret	1 Mercury	= 200	232
	2 Sulphur	(16×2) = 32	
.. Bicyanuret	1 Mercury	= 200	252
	2 Cyanogen	(26×2) = 52	
.. Protronitrate (dry)	1 Protoxide of Mercury	= 208	262
	1 Nitric Acid	= 54	
.. Pernitrate	1 Peroxide of Mercury	= 216	324
	2 Nitric Acid	(54×2) = 108	
Morphia			325
Nitrogen			14
Oxygen			8
Phosphorus			12

Potassa (dry)	1 Potassium	= 40		48
	1 Oxygen	= 8		
.. (hydrate)	1 Dry Potassa	= 48		57
	1 Water	= 9		
.. Acetate (dry)	1 Potassa	= 48		98
	1 Acetic Acid	= 50		
.. Arseniate (dry)	1 Potassa	= 48		110
	1 Arsenic Acid	= 62		
.. Arsenite (dry)	1 Potassa	= 48		102
	1 Arsenious Acid	= 54		
.. Bicarbonate (dry)	1 Potassa	= 48		92
	2 Carbonic Acid	(22×2) = 44		
.. .. (crystallised)*	1 Dry Bicarbonate	= 92		101
	1 Water	= 9		
.. Bisulphate (dry)	1 Potassa	= 48		128
	2 Sulphuric Acid	(40×2) = 80		
.. .. (crystallised)	1 Dry Bisulphate	= 128		137
	1 Water	= 9		
.. Bitartrate (dry)	1 Potassa	= 48		182
	2 Tartaric Acid	(67×2) = 134		
.. .. (crystallised)	1 Dry Bitartrate	= 182		191
	1 Water	= 9		
.. Carbonate (dry)†	1 Potassa	= 48		70
	1 Carbonic Acid	= 22		
.. Citrate (dry)	1 Potassa	= 48		106
	1 Citric Acid	= 58		
.. Nitrate	1 Potassa	= 48		102
	1 Nitric Acid	= 54		
.. Sulphate	1 Potassa	= 48		88
	1 Sulphuric Acid	= 40		
.. Tartrate (dry)	1 Potassa	= 48		115
	1 Tartaric Acid	= 67		
Potassium				40
.. Chloride	1 Potassium	= 40		76
	1 Chlorine	= 36		
.. Sulphuret	1 Potassium	= 40		56
	1 Sulphur	= 16		
.. Bisulphuret	1 Potassium	= 40		72
	2 Sulphur	(16×2) = 32		
Quinia				360
Silver				110
.. Oxide	1 Silver	= 110		118
	1 Oxygen	= 8		
.. Chloride	1 Silver	= 110		146
	1 Chlorine	= 36		
.. Nitrate	1 Oxide of Silver	= 118		172
	1 Nitric Acid	= 54		
Soda (dry)	1 Sodium	= 24		32
	1 Oxygen	= 8		

* Potassæ Carbonas of the Pharmacopœia.
† Potassæ Subcarbonas of the Pharmacopœia.

Soda, Hydrated	1 Dry Soda	= 32	41
	1 Water	= 9	
.. Acetate (dry)	1 Soda	= 32	82
	1 Acetic Acid	= 50	
.. .. (crystallised)	1 Dry Acetate	= 82	136
	6 Water	(9×6) = 54	
.. Carbonate (dry)	1 Soda	= 32	54
	1 Carbonic Acid	= 22	
.. .. (crystallised)*	1 Dry Carbonate	= 54	153
	11 Water	(9×11) = 99	
.. Citrate (dry)	1 Soda	= 32	90
	1 Citric Acid	= 58	
.. Sulphate (dry)	1 Soda	= 32	72
	1 Sulphuric Acid	= 40	
.. .. (crystallised)	1 Dry Sulphate	= 72	162
	10 Water	(9×10) = 90	
.. Tartrate (dry)	1 Soda	= 32	99
	1 Tartaric Acid	= 67	
.. Potassatartrate	1 Soda	= 32	214
	1 Potassa	= 48	
	2 Tartaric Acid	(67×2) = 134	
.. Hydrated Sesquicarbonate†	2 Soda	(32×2) = 64	166
	3 Carbonic Acid	(22×3) = 66	
	4 Water	(9×4) = 36	
.. Bicarbonate	1 Soda	= 32	76
	2 Carbonic Acid	(22×2) = 44	
Sodium			24
.. Chloride (common salt)	1 Sodium	= 24	60
	1 Chlorine	= 36	
.. Oxide (Soda)	1 Sodium	= 24	32
	1 Oxygen	= 8	
Strychnia			380
Sulphur			16
Sulphuretted Hydrogen	1 Sulphur	= 16	17
	1 Hydrogen	= 1	
Tin			59
Water	1 Oxygen	= 8	9
	1 Hydrogen	= 1	
Zinc			34
.. Oxide	1 Zinc	= 34	42
	1 Oxygen	= 8	
.. Carbonate	1 Oxide of Zinc	= 42	64
	1 Carbonic Acid	= 22	
.. Sulphate (dry)	1 Oxide of Zinc	= 42	82
	1 Sulphuric Acid	= 40	
.. .. (crystallised)	1 Dry Sulphate	= 82	136
	6 Water	(9×6) = 54	

* Sodæ Subcarbonas of the Pharmacopœia.
† Sodæ Carbonas of the Pharmacopœia.

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