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A

POPULAR TREATISE

ON THE

REMEDIES TO BE EMPLOYED

IN CASES OF

Poisoning and Apparent Death;

INCLUDING THE

MEANS OF DETECTING POISONS,

OF

DISTINGUISHING REAL FROM APPARENT DEATH,

AND OF

ASCERTAINING THE ADULTERATION OF WINES.

BY M. P. ORFILA,

Physician to the King; Corresponding Member of the Institute; Professor of Chemistry at the Royal Athenæum; Professor of Medical Jurisprudence, &c. &c.

Author of General Toxicology; of the Elements of Chemistry applied to Medicine, &c.

TRANSLATED FROM THE FRENCH, UNDER THE INSPECTION

OF THE AUTHOR,

BY WILLIAM PRICE, M.D.

PHILADELPHIA:

Published by Solomon W. Conrad, No. 87, Market Street

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1818.

Eastern District of Pennsylvania, to wit:

BE IT REMEMBERED, that on the twenty-second day of October, in the forty-third year of the independence of the United States of America, A. D. 1818, William Price, M. D. and James B. Price, of the said district, have deposited in this office the title of a book, the right whereof they claim as proprietors, in the words following, to wit:

"A popular Treatise on the Remedies to be employed in cases of Poisoning and apparent Death; including the means of detecting Poisons, of distinguishing real from apparent Death, and of ascertaining the adulteration of Wines. By M. P. Orfila, Physician to the King; Corresponding Member of the Institute; Professor of Chemistry at the royal Athenæum; Professor of Medical Jurisprudence, &c. &c. Author of General Toxicology; of the Elements of Chemistry applied to Medicine, &c. Translated from the French, under the inspection of the author, by William Price, M. D."

In conformity to the Act of the Congress of the United States, entitled, "An Act for the Encouragement of Learning, by securing the copies of Maps, Charts, and Books, to the authors and proprietors of such copies, during the times therein mentioned."—And also to the act, entitled, "An Act supplementary to an Act, entitled, 'An Act for the Encouragement of Learning, by securing the copies of Maps, Charts, and Books, to the authors and proprietors of such copies during the times therein mentioned,' and extending the benefits thereof to the arts of designing, engraving, and etching historical and other prints."

D. CALDWELL,

Clerk of the Eastern District of Pennsylvania.

REPORT

Made to the Society of the Faculty of Medicine of Paris, May 14th, 1818.

The Society has charged us, Messrs. Percy, Pinel, and myself, to give an account of a manuscript by M. Orfila, entitled "*A Popular Treatise on the Remedies to be employed in Cases of Poisoning and Apparent Death: including the Means of detecting Poisons, of distinguishing Real from Apparent Death, and of ascertaining the Adulteration of Wines.*"

The object of the author in composing this book has been, to render popular the most important information contained in his treatise on poisons, and to describe every thing relative to the different species of asphyxia; to the relief which should be administered to children born without

signs of life; to the characters which distinguish real from apparent death; to burns; and to the adulteration of wines.

The utility of such a work appears to us so evident, that it is unnecessary to dwell upon the subject. We will only say that M. Orfila has been particular in describing with the utmost precision, the diseases of which he has treated, and the means which he has employed to remove them. Rejecting all technical terms for others more generally known, and omitting all theory, he wishes that his work should be regarded as a collection containing only the precepts to be followed in the cure of persons poisoned, or in cases of asphyxia. We shall dispense with making known the method adopted by the author to accomplish this end, the treatment which he employs being nearly similar to that which he advises in his treatise on General Toxicology; a work which has justified the opinion the Institute had formed of it, since

the first edition is entirely sold, and a second is ready to appear.

When he attempts to distinguish the poisons, M. Orfila selects the most important characters, and those which can be most easily distinguished. Frequently one or two of these characters are sufficient to ascertain the poisonous substance.

The simple and precise manner in which this interesting subject has been treated by M. Orfila, renders it still more useful.

Freed as much as possible from scientific terms, which are often more difficult of comprehension to the unlettered than the principal subject, reduced to the most simple precepts, but sufficient for attaining the end proposed, the work of M. Orfila will be of general utility.

It is to be hoped, that government will take the necessary measures to have it distributed through all the classes of society, and especially, that it will be found in the hands of physicians, health-officers, magis-

trates, clergymen, &c. as a knowledge of the progress which has been made of late in the treatment of poisoned or *asphixied* persons has become, to them, a subject of great importance.

Given at the Society of the Faculty of Medicine, this 14th day of May, 1818.

(Signed)

PERCY, PINEL, VAUQUELIN.

Attested Copy,

DUMERIL, *Secretary General.*

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INTRODUCTION.

AMONG the severe diseases, those which demand the most prompt relief, are incontestibly Asphyxia and the different kinds of poisonings. The preservation of persons apparently dead, or poisoned individuals, always depends upon the rapidity with which the proper remedies are administered; whence it results that physicians, surgeons, and apothecaries, should become acquainted with the progress of medical science, in order to be able to combat these dangerous diseases, without loss of time.

It is also of the highest importance that mayors, clergymen, the heads of establishments, and of families, and the inhabitants of the country, should know all the resources of art in this respect, in order to give immediate relief to the unhappy victims of these accidents, when the practitioner is at a distance, and cannot arrive until some hours after the occurrence. Experience daily proves that these diseases often terminate unfavourably, only from a want of proper knowledge

on the part of those who are with the patient at the beginning of the affection. This consideration has induced us to publish the manual which we offer to the public: we have freed it from scientific terms, as being often more difficult of comprehension by such as are unacquainted with medicine than the subject itself; and wishing to adapt it to the capacities of all, have designedly omitted every thing relative to theory and to the examination of dead bodies; we intend that it should be considered a collection containing only the precepts to be observed in treating poisoned or asphixied individuals.

We have scrupulously described the manner of preparing and administering the remedies, and have indicated their doses and the time at which they ought to be given: we might even be accused of having been minute in certain details, and of repeating words that might have been omitted: the interests of the sick must be our excuse; and we are persuaded that such of our readers who possess no knowledge of medicine, will not blame us for having pointed out in detail, every thing relative to the treatment, in order to render it more intelligible.

We think it will be useful, before entering upon the work, to give some general notions of the subjects on which we are going to treat.

MINERAL POISONS.

The concentrated acids and alkalies, the preparations of arsenic, copper, antimony, mercury, bismuth, zinc, tin, gold and silver; nitre, artificial baths of Barege (*of sulphuretted hydrogen*), phosphorus, and sal ammoniac, are the mineral poisons of which we propose treating.

We shall commence by describing the effects they produce after having been introduced into the stomach or applied to wounds. When these effects are similar to those produced by a poison of which we have already spoken, we shall content ourselves with indicating the number of the section in which they may be found: by this means we shall be able to avoid many repetitions.

Under the title of *General considerations on the use of the preparations of Copper, Mercury, &c.* will be explained the danger arising from the employment of several of these preparations without the advice of a physician: we shall dwell particularly on those which are venomous when applied to wounds; and in conclusion will state every thing necessary to be known to avoid being poisoned.

In another article, entitled, *Means of distinguishing the preparations of Arsenic, Copper, &c.* we shall describe the most important characters of these poisons, and those which can be easily

verified: one or two of these characters will frequently be sufficient to discover the venomous substance. By the assistance of these data, the medical attendant can easily determine the nature of the poison swallowed, and will be able with more certainty to prevent its effects.

Before speaking of the treatment of poisoned persons, we shall examine, under the title of *Counter-poisons*, those substances which have been regarded as such by several physicians: we shall reject such as are useless or dangerous, and recommend only those the efficacy of which has been demonstrated by reiterated experiments. These are the *white of eggs*, *milk*, *common salt*, *vinegar*, *lemon juice*, *soap*, *gall-nuts*, and some other substances which may be procured with the greatest facility.

After having examined every thing relative to counter-poisons, we shall describe very minutely the manner of treating the various cases of poisoning; indicate the preparation of the medicines which should be administered, the doses in which they should be given, and the order in which they should be taken until the time when the patients become convalescent; and then, instead of abandoning them, we will follow them until completely re-established in health, being persuaded that it is necessary to give the most assiduous attention to convalescents, if we would not lose the benefit of the medicines already employed.

VEGETABLE POISONS.

We shall arrange the vegetable poisons in three sections: *the irritating*, *the stupifying*, and *the acrid narcotics*. At the commencement of each of these sections, will be enumerated the venomous substances comprised in it, and we shall afterwards speak of their effects in a general manner. The following article will be devoted to the treatment necessary to be adopted in order to prevent their effects; so that the particular histories which come immediately after, will have no other object than that of making known the energy of these poisons, the dangers to which a person is exposed in administering them himself, or in allowing them to be administered by ignorant persons, and the means of distinguishing them from one another.

Hence it follows, that in poisoning by a vegetable substance, it will be necessary to consult what has been said at the head of each section, in order to know its effects and the mode of treatment.

We shall carefully indicate in the general table the numbers corresponding to the various pages which treat of the matters of which we speak.

ANIMAL POISONS.

The animal poisons will be arranged under several heads. We shall speak in the first place of venoms; or of the effects produced by the bite of the viper, and other venomous reptiles, and by the sting of the scorpion, the bee, the drone, the fly, the gad-fly, the spider, the tarantula, the mosquito, &c. We shall describe in detail the symptoms produced by these animals, and the means of dissipating them.

The history of muscles, and of some fishes which, in certain circumstances, have produced deleterious effects, will follow immediately after.

Lastly, we shall treat of madness, and of the malignant pustule (charbon); stating minutely the means of opposing the ravages of these disastrous diseases, and of preventing them.

ASPHYXIA.

Cases of Asphyxia, or apparent death, will be treated with all the distinctness which they require. We shall speak of asphyxia from the vapour of charcoal, lime-kilns, and wine-presses, and from wines and other liquors in fermentation; of asphyxia from privies, common sewers,

and drains; of that by which the drowned and the hanged perish; and that which is produced by want of air, by cold, by heat, &c.

The processes by means of which air may be introduced into the lungs of asphixied persons will be described.

Under the head of "Relief to be administered to new-born Children who give no signs of life," we shall speak of the asphixy and the apoplexy of infants, diseases which cannot be confounded without danger, since the treatment proper for the one is hurtful in the other.

Marks of real Death; and, Of the precautions by means of which we may avoid confounding the living with the dead.

In this article we shall discriminate and appreciate the signs which have been regarded as determining whether an individual who appears dead is so in reality; we shall prove that no one of them taken separately, except an evident state of putrefaction, is sufficient to decide the question, and that judgment should be made from the whole together, if we would avoid committing most serious errors.

BURNS.

The means to be employed in the cure of Burns will make the subject of this article. We

shall first treat of superficial burns of small extent; and afterwards explain every thing which relates to superficial burns extending over a large part of the surface of the body. Lastly will be considered those which are deep, and which give rise to more or less extensive ulcers.

ADULTERATED WINES.

The last article of the work will be devoted to the consideration of adulterated Wines. In the first place we shall expose the frauds capable of occasioning more or less serious accidents. We shall indicate the means of detecting in wines the presence of lead, alum, excess of alcohol, &c.; and then pass to the history of wines adulterated by different sweet, colouring or astringent substances, the use of which is not in general attended with any danger. Lastly, we shall speak of the processes by the help of which we may discover arsenic, copper, and antimony, if by chance they should occur in wines.

Such are the subjects which we have thought it necessary to consider, in order to render this work useful.

RELIEF TO BE AFFORDED TO POISONED PERSONS, AND THOSE APPARENTLY DEAD.

CLASSIFICATION OF POISONS.

All the known poisons may be arranged in the four following classes:

1st. Irritating poisons, occasioning inflammation of the parts which they touch;
2d. Narcotic or stupifying poisons;
3d. Acrid narcotic poisons;
4th. Septic or putrifying poisons.

FIRST CLASS.

Irritating Poisons, occasioning inflammation of the parts which they touch.

THIS class contains the concentrated *acids* and *alkalies, corrosive sublimate,* and all the *mercurial preparations, arsenic* and *arsenical compounds, verdigris* and the other salts of *copper, tartar emetic, butter of antimony* and other *antimonial preparations;* the oxides and salts of *tin, gold, bismuth* and *zinc; lunar caustic,* and the crystallized nitrate of *silver, nitre, sal-ammoniac, liver of sulphur* (artificial baths of Ba-

reges) the salts of *barytes, phosphorus, glass* in fragments or coarsely powdered, *cantharides,* the salts of *lead,* and all the *acrid* plants or their principles, such as *gamboge, coloquint, spurge-laurel, euphorbia, ranunculus, anemone, celandine, house-leek,* the *aconite, savine,* &c.

1st. All these poisons inflame the parts with which they may come in contact, but in different degrees. Some of them produce so high an inflammation, that they may be regarded as caustics, almost as powerful as the hot-iron: they are called *corrosives, escharotics,* &c. and evidently occasion death in the same manner as burns: such are the concentrated acids, most of the alkalies, lunar caustic, the spurge-laurel, &c. There are others whose effects are less intense; but which destroy life with great rapidity, because they are absorbed, mixed with the blood, and carried into every part of the body, destroying the vital properties of the heart, lungs, brain, or nervous system; organs which are so essential to the preservation of the individual, that death is the inevitable result of any considerable alteration in them: arsenic, tartar-emetic, corrosive sublimate, barytes, aconite, or monk's hood, &c. are of this kind.

The difference of action exercised by the poisons of this class, predisposes us to admit that the symptoms which they develope are not always the same, consequently it is useful to establish a

certain number of subdivisions when attempts are made exactly to describe their effects, and particularly when the object is to oppose and destroy them.

Effects produced by the concentrated acids.

New Names.	*Old Names.*
Sulphuric Acid	Oil of Vitriol.
	Vitriolic acid.
	Spirit of Sulphur.
Sulphuric acid holding Indigo in dissolution	Blue composition, employed in dyeing.
Nitric or azotic acid . . .	Aqua fortis.
	Spirit of nitre.
	White nitrous acid.
	Dephlogisticated nitrous acid
Muriatic, or hydro-chloric, or hydro-muriatic acid . .	Marine acid.
	Spirit of sea-salt.
Nitro-hydro-chloric acid .	Aqua regia.
	Regaline acid.
	Nitro-muriatic acid.
Phosphoric acid	Acid of urine.
Hydro-phthoric or fluoric acid	Spathic acid.
Oxalic acid	Acid of sorrel or of sugar.
Tartaric acid	Tartareous acid.
	Acid of tartar.
Acetic acid	Radical vinegar.
	Acetous acid.
	Spirit of venus.
	Vinegar of wood.
	Vinegar.
	Pyro-ligneous acid.
Citric acid	Acid of lemons.
Chlorine	Oxigenated muriatic acid.
	Dephlogisticated marine acid

Symptoms.

2d. Immediately after having swallowed a concentrated acid, the following effects are experienced: a very disagreeable acid, burning taste; heat in the throat and stomach; acute pain in the throat which soon descends to the bowels; insupportable fœtor of the breath; frequent risings; inclination to vomit; abundant vomiting of different colored matters, sometimes mixed with blood, which redden tincture of turnsole like acids, and produce a sensation of bitterness in the mouth; hiccough; constipation, but, more frequently, copious, and more or less bloody stools; colic, or rather such an acute pain in the belly, that the weight of even the mere linen is insupportable to the patient; these pains sometimes extend to the chest; difficulty of respiration, anguish, pulse frequent and irregular, burning thirst: drinks augment the pain, and are soon vomited; chills from time to time, the skin and particularly the inferior extremities are almost cold as ice; cold and clammy sweats; repeated and fruitless efforts to void urine; continual change of position; convulsive movements of the lips, face and members; considerable depression of spirits; physiognomy little altered at first, but soon the hue becomes pale or leaden; the intellectual faculties preserve most frequently their powers. It is not

rare to see the interior of the mouth and lips burned, thickened and filled with white or black sloughs, which in separating, irritate the patient, and induce a fatiguing cough; the voice is then altered; there is sometimes a painful eruption on the skin.

The whole of these symptoms do not always exist in the same individual. Nitric acid or aqua-fortis produces also yellow spots upon the lips and those parts of the skin which it touches.

Counter-poisons.

3d. Our experiments prove that the best *counter-poison* for the acids is calcined *magnesia:* the patient should swallow without a moment's loss of time, a mixture of magnesia and water in the proportion of an ounce to a pint; a glass of this liquid should be given every two minutes, in order to procure vomiting, and to prevent the acid which has not yet acted from exerting its deleterious action. As magnesia is only found at the druggists, whilst that is procuring, several glasses of water, of a decoction of linseed, or of any other emollient drink should be administered; and it is necessary to remember that the success of the treatment depends upon the activity with which these drinks are given; a few moments delay changes entirely the fate of the patient. When magnesia cannot be procured, half an

ounce of *soap* dissolved in a pint of water should be given; Spanish white or chalk, pulverised coral, crabs eyes, prepared pearls, or burnt harts-horn diffused in water, in any quantity, may be extremely useful, when we can procure neither magnesia nor soap. Clysters prepared with the same substances should also be given.

Potashes and soda are too irritating to be employed in the same way as magnesia; treacle is altogether useless.

Treatment.

4. If, notwithstanding the employment of these remedies, the patient does not vomit, (a circumstance which is not likely) we must carefully avoid administering either tartar emetic, ipecacuanha, or other irritating substances, or tickling the throat already inflamed by the poison, with the finger, a feather, &c. Certain of having neutralised all the poison which has not acted, the principal object is to cure the inflammation produced; for this purpose, compresses dipped in a strong decoction of linseed, or of the roots or flowers of marsh-mallows, should be applied warm upon the belly; and if the patient cannot endure the weight of these compresses, the same liquids should be frequently sprinkled upon the part by means of a sponge; or what is still better, he should be placed in a warm bath. If a decided

and prompt relief be not obtained, twelve or fifteen leeches should be applied on the most painful part of the belly, and the patient bled. If by the effects of the leeches, the pain disappears, but shows itself in another part, this new point of irritation must immediately be covered by the same number of leeches, and we must not be alarmed if, by a new displacement of the pain, it should be necessary to have again recourse to fifteen or twenty leeches: the safety of the patient henceforward depends upon the abundant evacuation of blood: the debility which results from this evacuation should therefore be considered as but a slight inconvenience.

These external and energetic means will be assisted by the use of sweetened drinks, such as gum water, linseed, or mallows tea; every species of aliment must be forbidden, not even excepting the thinnest broth.

5. If the patient cannot swallow, in consequence of considerable inflammation of the throat, twelve or fifteen leeches should be applied without delay to the neck.

6. The cramps, wrinkles, and convulsive movements will disappear with the inflammation which has produced them: however, if they continue, a table-spoonful of a potion composed of four ounces of orange-flower, mint, balm, or lavender water, or of common tea, an ounce of sugar, thirty drops of Hoffman's anodyne liquor

or of æther, and twenty drops of Sydenham's liquid laudanum, should be given every quarter of an hour. When this potion cannot be procured, boil for a quarter of an hour, three or four poppy heads, in a pint of water; afterwards, add two or three orange leaves and three ounces of sugar, and give this potion in three doses, at intervals of half an hour.

7. After the disappearance of the effects produced by these acids, and when the fever is almost gone, the patient may be permitted to take some weak veal or chicken broth, and when the convalescence approaches, he may be allowed the use of barley and oatmeal gruel, fecula of potatoes, rice cream, beef broth, or of panada (boiled bread and water); solid aliments must be carefully avoided, as well as wine and spirituous drinks, which would irritate the stomach and renew the inflammation. It must be carefully remembered, that wine, though considered by many persons as a proper means of restoring the strength when apparently exhausted, is, in this case, a new poison, which acts precisely in the same manner as that whose effects have been combatted. It is not until three or four days after the patient is perfectly convalescent, that he can be permitted to take small quantities of solid aliments of easy digestion.

8. Let us now suppose an extreme case, in which the patient cannot swallow any of the

medicines prescribed, either because he experiences a convulsive spasm of the jaws, or constriction of the throat, or from any other cause, we must then have recourse to a means proposed by Boerhaave, and perfected by Dupuytren and Renault, which consists in introducing medicines into the stomach by means of a gum-elastic probe or tube, furnished with a syringe. "The gum-elastic tube," says Mr. Renault, "should be long enough for one of its extremities to reach the bottom of the stomach, and of a sufficient size to allow of the passage of soft matters, like those which are half digested; it should have two terminal orifices; the external is mounted with a ring of metal for the purpose of receiving the pipe of a syringe. Things thus disposed, the tube is introduced either by the mouth or the nose, the syringe is adapted, and a certain quantity of liquid is slowly injected, in order to dilute, hold in suspension, or dissolve the poison; the piston is then drawn up, a vacuum is produced, and a certain quantity of the matter contained in the stomach is withdrawn. After these two operations have been several times repeated, the stomach becomes well washed, and all the poison is extracted without commotion, almost without pain, and in a very short space of time. In every case in which the poison has not passed the pylorus, or is not in large fragments, the possibility of extracting it must be evident to every one the least acquainted

with natural philosophy. When experiments upon the human subject shall have demonstrated its efficacy, its use may become very extensive; but until experience shall have decided this point, I will confine myself to a report of some essays which I have made upon living animals. I have injected as much as eight ounces of water into the stomachs of several little dogs, and have always been able to pump it out entirely by the process which I have just described. It cannot be otherwise, when we recollect with what success analogous means are employed for evacuating the bladder when filled with coagulated blood."

9. When applied externally, the concentrated acids are not absorbed, and only produce burns, which are cured by the ordinary means: (see *Burns*, at the end of the work.)

Methods of distinguishing the Acids.

10. All the acids have the quality of reddening the blue tincture of turnsole. The sulphuric acid has no odour; heated with charcoal, it liberates the same odour as burning sulphur. Concentrated *nitric* acid is white; poured upon copper it bubbles and gives rise to orange-yellow coloured vapours. Concentrated *hydro-chloric* (muriatic) acid affords white vapours, and with the nitrate of silver, gives a white, curdled, heavy precipitate, insoluble in water and in nitric acid. The *aqua regia* is of a reddish yellow colour, and acts upon

copper like the nitric acid. *Phosphoric* acid, heated in a crucible along with charcoal, gives rise to the formation of phosphorus, which inflames. The *fluoric* acid corrodes glass. The *oxalic* acid, heated in a phial, *volatilises* almost entirely; a small portion is decomposed, leaving very little charcoal; dissolved in water, it gives a white precipitate with lime water, which is insoluble in an excess of oxalic acid. The *tartaric* acid is entirely decomposed by the action of fire, furnishing a great quantity of charcoal; dissolved in water, it precipitates lime water, and this precipitate is easily re-dissolved by an excess of tartaric acid. The *citric* acid is decomposed by heat, and only precipitates lime water when solid, or when the mixture is heated. The *acetic* acid has an odour of vinegar. *Chlorine* is of a greenish yellow colour, diffuses a disagreeable odour, dissolves gold-leaf, and destroys the colour of turnsole.

Effects produced by the concentrated Alkalies.

New Names.	*Old Names.*
Pure Potash	Caustic potash.
	Vegetable caustic alkali.
Sub-carbonate of Potash .	Salt of tartar.
	Oil of tartar per deliquium.
Soda	Caustic soda.
Sub-carbonate of Soda . .	Marine alkali.
	Caustic mineral alkali.
Liquid Ammonia	Volatile alkali.
Lime	Quick lime.
	Cream of lime.

Symptoms.

11. The effects of the concentrated alkalies enumerated, are nearly the same as those which have been described §2, in speaking of acids; it is only necessary to remark, that the taste of these poisons is acrid, caustic, and urinous, and that the matter vomited, far from being acid, is alkaline, changing to green the syrup of violets. The *concentrated volatile alkali* acts with more energy than the others, and much sooner occasions dreadful convulsions; experience proves that it is even very dangerous to apply it for a long time to the nostrils of persons who have fainted, in order to revive them: in fact, if it be very concentrated it evaporates; the vapour inflames the throat and lungs, and may occasion death, as has been lately ascertained: in such cases therefore, the bottle containing it should merely be passed gently under the nose from time to time.

Counter-poisons of the concentrated Alkalies.

12. It has been proved, by positive experiments, that vinegar and lemon juice are the best counter-poisons of the alkalies contained in this article. In cases of poisoning by them, therefore, several glasses of acidulated water, prepared by putting two table-spoonfuls of vinegar

or lemon juice into a glass of water, should be given with the greatest possible promptitude; and if these substances cannot be instantly procured, the patient should drink large quantities of water in order to produce vomiting; avoiding scrupulously tartar emetic, ipecacuanha, or other irritating substances. If the symptoms do not dissipate, recourse must be had to sweetened emollient drinks, to emollient fomentations, to leeches, &c. in a word, the same treatment we have recommended in § 4, and following.

Means of distinguishing the Alkalies.

13. The alkalies dissolved in water, colour the syrup of violets green. The *volatile alkali* has a very strong odour, by which it may be immediately recognised. *Lime* water is precipitated white by carbonic acid, or the alkaline carbonates, but does not become turbid by sulphuric acid. *Potash* and *soda* are not thus affected by either of these acids: *potash* is precipitated, of a yellow colour, by the muriate of platina; *soda*, on the contrary, remains transparent when mixed with this muriate.

Effects produced by Corrosive Sublimate and other Mercurial preparations, Arsenic and Arsenical compounds, Verdigris, and the other Salts of Copper, Tartar Emetic, Butter of Antimony, and other Antimonial preparations, the Salts of Tin, Gold, Bismuth, Zinc, and Silver.

14. Before speaking of each of these poisons in particular, it will be advisable to make known their effects in a general manner, being in most respects similar.

The taste of these substances is acrid, metallic, more or less analogous to that of ink, and less burning than that of the concentrated acids and alkalies. The patient sometimes complains of a constriction of the throat; pain soon occurs in the back part of the mouth, the stomach, and bowels; and soon after becomes insupportable; inclination to vomit, and vomiting succeed each other with more or less rapidity. The matter vomited is variously coloured, and often mixed with blood; it never colours the syrup of violets green, and when it reddens the blue tincture of turnsole, it is only very feebly; constipation or diarrhœa exist; sometimes the latter is bloody. To all these alarming symptoms, are joined frequent and often fœtid risings, hiccoughs, difficulty of respiration, and almost suffocation; the pulse becomes accelerated, small, and dense; it

seems in certain cases to vibrate under the fingers like a chord of catgut; it is not rare to observe it irregular and intermittent. An unquenchable thirst, difficulty of voiding urine, cramps, icy coldness of the extremities, dreadful convulsions, or a general deficiency of strength, alteration of the physiognomy, and delirium, are the symptoms which supervene, and announce a speedy death, if powerful relief be not administered without delay. In certain circumstances, the patient has the possession of his intellectual faculties, until the moment of death.

Mercurial Preparations.

New Names.	*Old Names.*
Deuto-chloride of mercury .	Corrosive sublimate.
	Super-oxigenated muriate of mercury.
	Oxy-muriate of mercury.
Red oxide of mercury, or .	Red oxide of mercury.
Deut-oxide of mercury . .	Precipitatum per se.
	Red precipitate.
Black sulphuret of mercury	Ethiops mineral.
Red sulphuret of mercury .	Cinnabar.
	Vermillion.
Sub-deuto sulphate of mercury	Turbith mineral.
	Yellow sulphate of mercury.
Nitrate of mercury . . .	Mercurial nitre.
Sub-deuto nitrate of mercury	Mercurial water.
	Mercurial dissolution.
Mercurial ointment . . .	Blue ointment.
	Neapolitan ointment.

Effects of the preparations of Mercury.

(See § 14)

Considerations on the use of Mercurial preparations.

15. The greater number of the preparations of mercury become powerful remedies in the hands of a skilful physician; but as ignorant persons often sport with popular credulity, and administer them without precaution, it is important to mark the dangers to which patients are exposed.

Corrosive sublimate in solution, is very rarely taken in the dose of one grain, without producing serious accidents; much more if the quantity prescribed be double or triple. Placed upon wounds, cancers, wens, &c. with the intention of curing them, it acts as a violent poison, and death ensues in ten, fifteen, twenty, or thirty hours, as we have had occasion to observe: whence it follows that it should never be externally employed in these diseases.

The *grey ointment*, and particularly the *Neapolitan ointment*, which is often rubbed upon the head or other parts of the body to kill lice, are not always free from danger; experience proves that, in certain cases, when the quantity of ointment employed is considerable, the

rubbing continued long, and the skin very delicate, several of the symptoms of poisoning may be produced.

Counter-poisons of the Mercurial preparations.

16. We have proved by incontestible experiments, that the *white of eggs beat up in cold water*, is the best antidote to corrosive sublimate, and to all the mercurial compounds. For want of white of eggs, *milk* may be employed with great success. The *alkalies* and *alkaline earths*, *livers of sulphur*, *sulphuretted hydrogen*, the *hydro-sulphates*, the *bark water*, *charcoal* and *charcoal water*, recommended by several authors, are always useless, and often dangerous; whence it follows that they ought to be banished from the treatment which we are about to examine.

Treatment.

17. When an individual is poisoned by a mercurial preparation, introduced into the stomach, or applied externally, the whites of twelve or fifteen eggs (even the yellows may be used without inconvenience) should be mixed up with two pints of cold water, and a glass of this drink given every two minutes, in order to promote vomiting. If the number of eggs mentioned are not to be had, far from foregoing this salutary

drink, those which are at hand should be employed: and in the mean time others sought for. When they cannot be procured, milk should be given in abundance; and if neither eggs nor milk can be procured, gum-water, infusion of linseed, of the flowers or roots of mallows, sweetened water, and even pure water should be administered without delay.

If, after having given the quantity of eggs prescribed, the vomiting and other symptoms be not sensibly calmed, the same number should be repeated, having previously diluted them that they may act with more rapidity.

These first remedies once administered, the patient must be treated as we have recommended in speaking of the acids, § 4 and following, except that vomiting ought to be favoured by introducing the finger into the mouth, or by tickling the throat with a feather.

Means of distinguishing the Mercurial preparations.

18. All the mercurial preparations, heated to redness in a glass tube with potash, are decomposed, the mercury (quicksilver) is set at liberty and volatilises. The *corrosive sublimate* is white, soluble in water, and is precipitated yellow by potash, and white by ammonia. The *Deut-oxide*

of mercury is red, soluble in the hydro-chloric (muriatic) acid, and is converted into corrosive sublimate. *Cinnabar* is red, insoluble in water and in the hydro-chloric acid. The *mercurial ointment*, boiled with water, is decomposed; the grease melts, and the mercury is deposited.

Arsenical Preparations.

New Names.	*Old Names.*
Arseneous acid or White oxide of arsenic	White arsenic.
Arsenic acid	Arsenical acid.
Super-arseniate of potash .	Arsenical neutral salt of Macquer.
Arseniate of soda . . .	Arsenical salt of soda.
Arseniate of ammonia . .	Arsenical ammoniac.
Arsenite of soda	Arsenical salt of soda.
Yellow sulphuret of arsenic	Native or artificial orpiment.
Red sulphuret of arsenic .	Native and artificial realgar.
Black oxide of arsenic or protoxide of arsenic . .	Fly powder.
Arsenical paste	Paste of Rousselot or of frère Cosme.

Effects of Arsenical Preparations.

(See § 14.)

Remarks on the use of Arsenical preparations.

19. The paste of Rousselot has been employed externally for a length of time by the most celebrated surgeons to destroy certain cancers; experience proves however that the white arsenic, which enters into its composition, may cause all the symptoms of poisoning, and occasion death in the space of twenty-four or forty-eight hours; it is therefore necessary to take the greatest precautions in the use of such a remedy. What inconvenience there would be in preparing it without arsenic is a question. We think it would be possessed of nearly the same advantages, without giving rise to the same dangers. The other *arsenical* preparations are much more poisonous than this paste when placed upon wounds.

Swallowed, even in very small doses, the arsenical compounds are energetic poisons. They do not kill, as is vulgarly believed, because they burn the stomach and intestines, but because they are absorbed and destroy the vital properties of the heart; very often they even inflame and ulcerate this organ. These facts being established, can we flatter ourselves with obtaining any advantage from arsenic in the cure of tertian and quartan fevers, &c. as some physicians think who have dared to administer it repeatedly? We think it dangerous to persevere in treating diseases of

this kind by the poison in question when they are not cured by the third or fourth portion, *employed in very small doses and with the greatest precautions.* In fact they not only often give rise to serious accidents in a short time after their administration, but they dispose the patient afterwards to a disease of the heart, as appears to have been already observed.

Treatment of Persons poisoned by Arsenical preparations.

20. The best manner of treating a case of poisoning where an arsenical preparation has been introduced into the stomach or applied externally, consists in administering several glasses of either *sugared water, warm* or *cold water,* decoction of the roots of mallows or of linseed: by these means, the stomach is filled, vomiting takes place, and the poison is necessarily rejected. We may also give some glasses of a mixture of equal parts of lime water* and sugared water. *Treacle, oil, gall-nuts, bark, pine and pomegranate barks, liver of sulphur,* and *vinegar,* recommended by some physicians, ought not to be employed, because they are useless and often dangerous.

* Lime water is prepared by heating, for five or six minutes, a quarter of an ounce of slacked quick-lime in two pints of water; the liquor should be strained through a linen cloth.

When the principal symptoms are diminished, the patient should be nursed as directed § 7. If on the contrary, notwithstanding the treatment we direct, the disease continue or increase, if the pains of the belly be severe, if the individual have convulsive movements, bleeding, leeches, &c. are to be prescribed; in a word, the same conduct should be pursued that is laid down in the article Acids. See § 4, and following.

Means of distinguishing the Arsenical preparations.

21. The *white arsenic* (deut-oxide of arsenic) is under the form of a white powder like sugar; but it differs from it in being much heavier, in volatilising and diffusing an odour of garlic when put upon burning coals; in being insoluble in cold water; and, in becoming of a very fine green when put into blue ammoniacal sulphate of copper. The *arsenic* acid is white, diffuses an odour of garlic when thrown upon burning coals, dissolves very readily in water, and passes to a very clear blue when put into ammoniacal sulphate of copper.

Orpiment is yellow: exposed to a red heat with potash, it diffuses arsenical vapours which smell of garlic. *Realgar* acts in the same manner with potash, but is red. The *Fly powder* is blackish, gives out vapours smelling of garlic

when thrown upon burning coals, and becomes green when left several hours in the blue ammoniacal sulphate of copper.

Preparations of Copper.

New Names.	*Old Names.*
Sub-acetate of copper . .	Verdigris. Artificial verdigris. Oxide of copper.
Sub-carbonate of copper .	Natural verdigris.
Crystallised acetate of copper	Crystallised verdetum. Crystals of Venus.
Sulphate of copper . . .	Blue copperas. Blue vitriol.
Hydro-chlorate of copper .	Muriate of copper.
Nitrate of copper . . .	Nitre of copper.
Oxide of copper	Rust of copper.
Ammoniacal oxide of copper	Celestial water.
Hydro-chlorate of copper and ammonia	

Effects of the preparations of Copper.

(See § 14.)

Remarks on the use of the Preparations of Copper.

22. All the preparations of copper included in the table are poisonous when introduced into the stomach, even in small doses. They may, however, be applied to wounds without any other inconvenience than a local inflammation.

The *natural verdigris* (sub-carbonate of copper) observed on pieces of money, in fountains, and on copper stop-cocks, may be put in water without communicating to it any hurtful quality, because it is not dissolved by it; but if, in drinking water which contains the natural verdigris, a part of the latter be swallowed, it will produce all the symptoms of poisoning: it is therefore prudent never to drink water which has been kept in vessels covered with the green powder alluded to.

The *artificial verdigris* (sub-acetate of copper) is easily dissolved by water; it is always poisonous, whether swallowed in powder, or dissolved in water. Too much care cannot be taken to prevent the formation of this powder in kitchen utensils. It is known that saucepans, &c. well tinned offer no kind of danger, whatever articles may be cooked in them; but it is equally true that when they are badly tinned, wine, vinegar, currant and gooseberry juice, &c. oil, and all greasy substances, cause the formation of verdigris, which, mixing with food, occasion the most fatal accidents. The quantity of verdigris produced, is above all very considerable when the substances of which we speak are imprudently left to cool in copper vessels; it is therefore of the greatest importance, after having been obliged to make use of badly tinned vessels, to pour off whatsoever is cooked in them, while it is still

boiling. It also happens sometimes that people are poisoned after having eaten salad seasoned with the vinegar contained in the little copper casks of vinegar pedlars, and it is because this vinegar contains verdigris. Lastly, certain medicines made and left for some time in copper vessels, have often become poisonous from the same cause.

Counter-poisons for Verdigris and the other Salts of Copper.

23. It results from our experiments that the *white of eggs* is the best counter-poison of verdigris and the other copper salts.

Sugar, which has been regarded as such by several persons, may be useful in cases of poisoning from the preparations of copper, but it is not their counter-poison. The *liver* of *sulphur*, the *alkalies*, *gall-nuts*, *bark*, *charcoal*, &c. also considered as remedies, are useless, often dangerous, and ought consequently to be banished.

Treatment.

24. A person poisoned by verdigris or by any other copper salt, ought to be treated as directed in treating of Corrosive Sublimate.—(See § 17.)

Means of distinguishing the preparations of Copper.

25. The salts of copper dissolved in water, are, in general, of a blue or green colour. The prussiate of potash gives a reddish brown precipitate, *metallic* iron and phosphorus instantly separate the copper. The *artificial verdigris* is not entirely soluble in cold water; boiled in water, it affords a blue liquor and a blackish brown powder. Exposed to a red-heat in a crucible, it is decomposed and yields metallic copper.

Antimonial Preparations.

New Names.	*Old Names.*
Antimoniated Tartrate of Potash	Tartar of Stibia. Tartar emetic. Antimoniated tartar.
Coloride of Antimony . .	Butter of antimony. Muriate of antimony.
Sub-hydro-Sulphate of Antimony	Kermes mineral. Brown hydro-sulphuretted oxide of antimony.
Sulphuretted sub-hydro-Sulphate of Antimony . .	Golden sulphur of antimony. Orange coloured hydro-sulphuretted oxide of antimony.
Hydro-chlorate of Antimony	Muriate of antimony.
Sub-hydro-chlorate of Antimony	Powder of algaroth. Mercury of life. Mercury of death. Sub-muriate of antimony.
Deut-oxide of Antimony (by fire). .	Flowers of antimony.

New Names.	*Old Names.*
White sublimated oxide of Antimony	Snow of antimony.
Deut-oxide of Antimony . (by nitre).	Washed or diaphoretic antimony.
	Pearly matter of Kerkringius.
Deut-oxide of Antimony with potash	Unwashed diaphoretic antimony.
Deut-oxide of Antimony by aqua-regia.	Mineral bezoar.
Oxide of Antimony, more or less sulphuretted, and mixed with silex	Liver of antimony.
	Crocus metallorum.
	Saffron of metals.
	Glass of antimony.
Antimonial wine	

Effects of the Antimonial Preparations.

26. Tartar emetic, kermes, butter of antimony, &c. employed every day by physicians with the greatest success, may become dangerous even in small doses, if they be not vomited. The symptoms to which they give rise have already been described in a general manner, § 14: it is to be remarked however that they occasion more particularly abundant and obstinate vomiting, very copious stools, a great difficulty of respiration, and often such a constriction of the throat, that the patient can swallow nothing; and afterwards very painful cramps, a sort of intoxication, and depression more or less considerable.

Remarks upon the use of the Antimonial Preparations.

27. The preparations of antimony are often administered inconsiderately, because they are not regarded as dangerous; but experience proves that tartar emetic may occasion death in the dose of a few grains, when it is not vomited; an extreme depression and great debility has been observed to succeed the use of even a single grain which had not produced any evacuation. Sometimes, on the contrary, it excites such abundant and painful vomitings, that they are obliged to be suppressed. This is particularly observable in children. Hence it follows that it is very imprudent to make use of this medicine without the advice of a physician.

Mixed with oil or other substances, this substance may occasion death, when applied externally, as an irritant.

The butter of antimony, employed with success against the bites of mad animals, should never be introduced into the stomach, for it would corrode the parts, giving rise to an active inflammation, which would soon terminate in death.

Treatment.

28. Let us suppose that the patient poisoned by an antimonial preparation is affected with abundant vomitings, pains and cramps of the stomach, &c. The vomiting must be promoted by the administration of several glasses of sweetened, or simple water whilst the sugar is melting. If, notwithstanding the use of these means, the vomitings and pains continue or augment, a grain of the extract of opium should be given, dissolved in a glass of sweetened water, and repeated three times, at intervals of a quarter of an hour, if the symptoms be not calmed. In the absence of opium, an ounce of the syrup of poppies dissolved in a glass of water should be given; and if this syrup is not to be procured, the decoction of poppy heads, of which we have given the preparation § 6, should be prescribed.

If the symptoms should still continue or augment, twelve or fifteen leeches should be applied upon the region of the stomach; and if the constriction of the throat should prevent swallowing, the same application should be made to the neck.

Let us suppose, at present, that the individual who has taken an antimonial preparation has not vomited, and presents the symptoms of being poisoned, several glasses of sugared water should be administered. If they do not produce vo-

miting, four or five gall-nuts broken small, or two ounces of bark grossly powdered, should be boiled in two pints of water, for ten minutes: for want of these substances, oak or willow bark may be used; several glasses of this drink should be given.

Experience has convinced us that gall-nuts should be preferred to the other substances. Special care must be taken not to give the patient ipecacuanha, or white or blue vitriol (sulphate of zinc or copper) with the design of exciting vomiting: these remedies would aggravate the disease and augment the irritation.

If, notwithstanding the employment of these remedies, the disease advances, recourse must be had to leeches, and the plan of treatment adopted as laid down in § 4.

Means of detecting the Antimonial preparations.

29. All the preparations of antimony when exposed to a red heat, in a crucible, with potash and charcoal, yield metallic antimony, which is easily recognised; 1st. by its bluish white colour: 2d. by the property which it has, when heated with nitric acid, of giving a white powder, soluble in hydro-chloric acid: this solution gives an orange precipitate with hydro-sulphuric acid, and a white one with water.

Tartar emetic is white: thrown upon burning coals, it becomes black and affords metallic anti-

mony. It is soluble in water; the solution is not made turbid by distilled water; it is precipitated of an orange colour by the hydro-sulphuric acid, of a greyish white by the infusion of galls.

The kermes has a velvet appearance; is of a red brown, and changes to a yellowish white when heated with a solution of potash. The golden sulphur is of an orange colour; treated with the potash, it gives the same phenomena as the kermes.

The butter of antimony is white and melts like grease; mixed with water, it becomes turbid, and gives a white precipitate.

The solutions of the other antimonial salts are precipitated white by water, and orange or red by the hydro-sulphuric acid and hydro-sulphates. The oxides of antimony dissolve in the hydro-chloric (muriatic) acid, and give a salt of antimony, which may be recognised by the means just pointed out.

Preparations of Tin, Bismuth, Gold and Zinc.

New Names.	*Old Names.*
Hydro-chlorate of tin . .	Muriate of tin.
	Chloride of tin.
	Butter of tin.
	Fuming liquor of Libavius.
	Horn tin.
	Salt of tin.
Protoxide and Deut-oxide of	Grey oxide of tin.
tin	Flowers of tin.
Nitrate of bismuth . . .	Pearl white.

New Names.	*Old Names.*
Sub-nitrate of bismuth . .	Oxide of bismuth.
	Magistery of bismuth.
Hydro-chlorate of gold .	Muriate of gold.
	Salt of gold.
Oxide of zinc	Flowers of zinc.
	Pompholix.
	Nihil album.
	Philosophical wool.
Sulphate of zinc	White vitriol.
	White copperas.
	Vitriol of zinc.

Effects of the preparations of Tin, Bismuth, Gold and Zinc.

We have spoken of the effects of these preparations § 14.

Observations on the use of Tin, Bismuth, Gold and Zinc.

30. The preparations of tin are poisonous, and ought not to be confounded with common salt, as has been the case in a colouring factory, where the salt of tin was used as a mordant.

Metallic tin is not hurtful, and may consequently be employed without danger in tinning.

The *Magistery of bismuth* (sub-nitrate of bismuth,) which is often employed to whiten the skin, has the double inconvenience of preventing perspiration by stopping the pores, and of giving rise to chronic diseases, such as rheumatisms, nervous pains, &c.

Zinc is employed with success in the manufacture of boilers and baths; but it should not be employed in the construction of kitchen utensils, for experience proves that water, feeble vegetable acids, butter and some salts, act on and dissolve it, so that food prepared in such vessels may occasion diarrhœa, vomitings, and other bad effects, particularly in delicate persons.

The salts of zinc are all more or less emetic.

Treatment.

31. It has been experimentally ascertained, that *milk* is the best counter-poison for the salts of tin; several glasses of it should therefore be administered; but whilst waiting its arrival, warm or cold water should be given to favour the vomiting: finally, if the symptoms increase, the same means should be adopted as directed § 4, and following.

Cases of poisoning by the salts of bismuth, gold and zinc, should be treated as those produced by arsenic. See § 20.

Methods of discovering the preparations of Tin, Bismuth, Gold and Zinc.

32. The salts of *tin* are not precipitated by distilled water; they are precipitated white by

potash, and yellow or chocolate brown by the hydro-sulphates. The salts of *bismuth* are precipitated white by distilled water, and black by the hydro-sulphates. The salts of *gold* are yellow; they are precipitated black by green vitriol. The salts of *zinc* are precipitated white by potash, and by the hydro-sulphates.

Preparations of Silver.

New Names.	*Old Names.*
Nitrate of silver	Lapis infernalis.
	Lunar caustic.
Ammoniuret of silver . .	Fulminating silver.

Effects of the preparations of Silver.

(See § 14.)

33. The nitrate of silver (lunar caustic,) which perhaps may be used with advantage in epilepsy, is very poisonous when swallowed. Applied, however, upon the skin, or upon wounds, the preparations of silver only inflame and burn them: it is therefore doubtful whether surgery will ever discover a caustic possessed of less inconveniences than the lapis infernalis.

Treatment.

34. It has been shown that common salt is the best antidote against the nitrate of silver:

persons poisoned by this substance should therefore swallow several glasses of salt water, prepared by dissolving a table-spoonful of salt in two pints of water; vomiting will follow, and the symptoms will dimmish. If by chance they continue, recourse should be had to leeches, emollient drinks, fomentations, and all the measures indicated in § 4.

Characters of the Nitrate of Silver.

35. The nitrate of silver or lapis infernalis, may be known by the following characters: 1st. On exposing it to a red heat, the silver will be reduced. 2d. On dissolving it in water, the liquid will give a white precipitate with solution of common salt; a yellow with the phosphate of soda; and a red one with chromate of potash.

Poisoning by Nitre, Sal ammoniac, and the Liver of Sulphur.

New Names.	*Old Names.*
Nitrate or azotate of deut-oxide of potassium or of potash	Nitre. Salt of nitre. Saltpetre.
Hydro-chlorate of ammonia	Sal-ammoniac. Muriate of ammonia.
Sulphuret of potash . . .	Liver of sulphur. Barege baths (or of sulphuretted hydrogen.)

OF NITRE.

Effects of Nitre.

36. Nitre, which many physicians do not regard as a poison, is venomous both to man and animals, even when applied to wounds. It gives rise to obstinate and bloody vomitings, to an active inflammation of the stomach, and consequently to the symptoms attending this inflammation, and which resemble more or less those which have been spoken of § 14. We ought particularly to observe that it affects the nervous system, often occasioning a sort of intoxication, palsy of the limbs, convulsions, and other nervous diseases.

Treatment.

37. The individuals who have been poisoned by nitre should be treated like those who have swallowed arsenic, except that lime water should not be used. See § 20.

Characters of Nitre.

38. It is particularly important to distinguish nitre from Glauber's salt (sulphate of soda) in place of which it has sometimes been given by

mistake. Thrown upon burning coals, nitre crackles and gives a beautiful white flame: on the contrary, Glauber's salt melts, puffs up, and becomes opake. Reduced to a fine powder and mixed with the oil of vitriol, (concentrated sulphuric acid,) nitre gives out white vapours: nothing of the kind is observed with Glauber's salt.

SAL AMMONIAC.

Effects of Sal Ammoniac.

39. Sal ammoniac, though often employed by physicians and surgeons, is poisonous when introduced into the stomach or applied upon wounds in large quantities. It occasions vomitings, convulsive movements, a general stiffness, pains in the belly, alteration of the features, and death.

Treatment.

40. Vomiting should be immediately induced by means of several glasses of water, or, what is better, of sugar and water, by introducing the fingers into the mouth, and by tickling the throat with a feather; the nervous affections should afterwards be calmed by administering the antiphlogistic potion described § 7, for which may be substituted, if necessary, a decoction of poppy heads mentioned in the same section. If the

pain of the belly should continue or augment, twelve or fifteen leeches should be applied, and the same treatment as described § 4.

Characters of Sal Ammoniac.

41. Exposed to heat, sal ammoniac volatilises, producing a white vapour; triturated with quick lime, it diffuses the odour of volatile alkali or hartshorn; dissolved in water and mixed with the nitrate of silver, it occasions a very heavy white precipitate.

LIVER OF SULPHUR (SULPHURETTED HYDROGEN BATHS.)

Effects of the Liver of Sulphur.

42. The liver of sulphur usually employed in the preparation of artificial baths of Bareges, (sulphuretted hydrogen baths), far from being the counter-poison of arsenic, lead, &c. as many physicians still believe, is a violent poison. We had proved this a long time since by experiments upon animals; but unhappily the sad accident which has lately befallen the Countess ***, furnishes us with an irrevocable proof of the destructive powers of this substance. Having swallowed by mistake a part of the liver of sul-

phur intended for the preparation of a bath, this unfortunate lady expired in a few minutes. We think it necessary on this occasion to observe, that two or three ounces of this poison may be employed without danger in the form of a bath; but that the twentieth part of this quantity taken into the stomach, may give rise to the most serious symptoms, and even occasion death.

The effects produced by the liver of sulphur are nearly similar to those from nitre, but much more violent. See § 36.

Treatment.

43. As soon as it is discovered that an individual has swallowed some liver of sulphur, he should drink several glasses of acidulated water, prepared by putting two table-spoonfuls of vinegar or lemon juice into each glass. When, by this means, vomiting has been produced, and the decomposition of the liver of sulphur shall have been effected, twelve or fifteen leeches should be applied to the painful parts of the belly, unless the symptoms be already very much diminished; and afterwards, the rest of the treatment should be conducted as has been directed § 4 and following.

Characters of the Liver of Sulphur.

44. The liver of sulphur is solid, and of a greenish yellow colour: mixed with water and vinegar, it disengages an insupportable odour of rotten eggs.

PREPARATIONS OF BARYTES.

New Names.	*Old Names.*
Protoxide of barium, or barytes	Ponderous earth. Ponderous spar.
Carbonate of barytes . .	Aerated ponderous earth.
Hydro-chlorate of barytes .	Muriate of barytes.

Effects of the preparations of Barytes.

45. These preparations are extremely poisonous when taken into the stomach, or applied upon wounds; they are rapidly absorbed, carried into the circulation, and occasion vomitings, convulsions, palsy of the limbs, pains in the belly, hiccoughs, alteration of the countenance, and death. It is very important that those who employ the muriate of barytes should be informed of the injury it is capable of occasioning when given in too large a dose: it is equally essential that apothecaries or patients should not confound it (as has lately happened in England) with Glauber's salt.

Treatment.

46. The patient who has swallowed a preparation of barytes, should immediately take several glasses of a weak solution of *sulphate of soda* (Glauber's salt), *sulphate of magnesia* (Epsom salt): for example, half an ounce of either of these salts dissolved in a pint of water. Experience has convinced us that there is no better counterpoison for the preparations of barytes. In the absence of the salts of which we speak, well-water, which contains a great deal of sulphate of lime (plaister of Paris or gypsum) may be administered with the greatest advantage. When this treatment shall have promoted vomiting, decomposed the poison which had not yet acted, and calmed the principal symptoms, some sweetened water, or any other emollient drink should be given; and in case the effects instead of diminishing, should increase, the treatment recommended § 4 and following, should be adopted.

Characters of the preparations of Barytes.

47. All the soluble preparations of barytes, mixed with well-water, or with a solution of Glauber's or Epsom salt, give a white precipitate insoluble in water and in nitric acid (aquafortis): it is therefore impossible to confound them with

the sulphate of soda, which does not render any of these liquids turbid. Barytes, dissolved in water, changes the syrup of violets to green.

PHOSPHORUS.

Effects of Phosphorus.

48. Phosphorus introduced into the stomach in small portions is poisonous; but it is much more so when it has been dissolved in oil, æther, &c. It always gives rise to the same symptoms as the mineral acids of which we have already spoken: whence it follows that the effects which it produces should be opposed by the same means.

CANTHARIDES.

Spanish flies.
Tincture of Cantharides.
Emplastrum epispasticum.

Effects of Cantharides.

49. Applied upon the skin or taken into the stomach, cantharides often give rise to very serious symptoms, which may be followed by death. The symptoms they produce when they have been swallowed are these: a nauseous and infectious odour, an acrid and very disagreeable taste, a burning heat in the throat, stomach, and other

parts of the belly; inclination to vomit; frequent vomitings often mixed with blood; copious and more or less bloody stools; excruciating pain in the belly, particularly towards the stomach; obstinate and very painful priapism; heat in the bladder, great difficulty in voiding urine; sometimes the urine is entirely suppressed, and when the patient is able to evacuate a few drops, it is only with the greatest difficulty; it is often mixed with blood; the pulse is frequent and hard; in some circumstances, it is impossible to swallow liquids, they are even rejected with horror: the jaws are fixed: and at last, frightful convulsions, a general stiffness, and delirium manifest themselves, and death soon closes the scene.

This picture of the symptoms occasioned by cantharides, points out the danger incurred by swallowing them in order to stimulate for a moment the organs of generation debilitated by age, by disease, or most frequently by debauchery.

Treatment.

50. The patient should drink a large glass of sweet oil to produce vomiting; or, in the absence of this substance, several glasses of water, or better still of sugar and water, milk, decoction of mallows, or of linseed tea; the subsequent treatment will depend upon the symptoms, as directed

§ 4 and following. Independent of these measures, one or other of the above mentioned emollient liquids should be injected into the bladder, to prevent or cure its inflammation. If notwithstanding the employment of these remedies, the inflammation of the bladder and difficulty of passing urine continue, friction should be applied to the skin of the inner parts of the thighs and legs, with two ounces of oil in which a quarter of an ounce of camphor has been dissolved by heat. Eight or ten grains of camphor rubbed down with the yellow of an egg might also be administered internally.

If the poisoning be produced by the external application of cantharides, vomiting need not be excited: the patient should be placed in a warm bath; and should take every five minutes a glass of sugared water; the frictions which we have just recommended should be employed; and if he complain of an acute pain in the region of the bladder or of the stomach, twelve or fifteen leeches should immediately be applied to the painful part; the application of cloths dipped in a decoction of mallows or linseed, upon all the suffering parts, should also be made.

Characters of Cantharides.

51. The powder of cantharides, even when finely sifted, is of a greenish grey colour, and

offers a number of brilliant points, of a very fine green: it has an acrid and nauseous odour; placed upon burning coals, it disengages a fœtid odour, similar to that of burning horn, leaving a charry residuum.

OF GLASS AND ENAMEL.

52. Glass and enamel finely powdered may be swallowed without any danger; if they are in pointed fragments, they produce the same inconvenience as all other sharp bodies, that of lacerating and inflaming the mucous membrane of the stomach. A person who complains of pains in the stomach, heat and other symptoms, after having swallowed some glass or enamel, should eat large quantities of beans, potatoes, cabbage, bread, or any other usual aliment; by this means, the stomach will be filled and the glass enveloped: two or three grains of tartar emetic should then be given, dissolved in a glass of water; vomiting will thus be excited and the glass evacuated; milk should afterwards be given; emollient clysters; and fomentations of the same kind applied to the belly; the patient should be placed in a bath; and if the inflammation of the stomach continue or become more intense, twelve or fifteen leeches should be applied to the pit of the stomach.

PREPARATIONS OF LEAD.

New Names.	*Old Names.*
Acetate of lead	Sugar of lead. Salt of saturn.
Sub-acetate of lead . . .	Extract of saturn.
Sub-acetate of lead decomposed by water . . .	White water. Goulard's water. Aqua vegeto-mineralis.
Carbonate of lead . . .	White lead.
Protoxide of lead . . .	Litharge. Massicot.
Deut-oxide of lead . . .	Minium. Red oxide of lead.
Litharged wine	Wine sweetened with lead.

I have shown in my General Toxicology that the effects produced by the preparations of lead when introduced in sufficient quantity into the stomach, should not be confounded with those which result from the fumes of lead, and which constitute the colic of painters.

Effects of the preparations of Lead introduced into the Stomach.

53. When a considerable dose of sugar of lead (acetate of lead) or any other preparation of this kind soluble in water, has been swallowed, the patient experiences a sugary, astringent, metallic, disagreeable taste; a constriction of the

throat, pains more or less acute in the region of the stomach, inclination to vomit, obstinate, painful, and often bloody vomitings; in short, all the symptoms which result from an inflammation of the stomach, and which have been described § 14, in speaking of corrosive sublimate. If, instead of taking into the stomach a large dose of lead, water or wine containing very little of this metal be drank, no inconvenience may be felt from it at first; but if the use of these drinks is continued, they ultimately produce a chronic disease, which, in general, resembles the colic of painters, (of which we shall soon speak,) but which, in certain circumstances, is a true palsy.

Considerations on the use of Lead and its compounds.

54. Metallic lead may be swallowed without any inconvenience; but kitchen utensils made with this metal should be banished, because it is attacked by several culinary acids, which dissolve it, producing salts which are poisonous. It is, however, perfectly proved that utensils made with an alloy of equal parts of lead and tin, may be employed without danger. Vinegar and lemon juice do not attack this mixture.

It is very dangerous to drink water which has been kept for a long time in leaden vessels ex-

posed to the air: if the effects of poison do not immediately follow, it is not long before the person experiences disastrous symptoms, which may even terminate in death. It is equally necessary to avoid drinking well water drawn in leaden buckets. And unhappy consequences have been observed in persons who have drank of rain water, that had been conveyed by leaden pipes, or which had fallen upon roofs covered with this metal, and afterwards been retained in vessels.

Wines of a bad quality, which have been left to stand a long time upon litharge, in order to sweeten and render them better tasted, are still more poisonous than water containing lead.

Syrups and brandies clarified with the sugar of lead (acetate of lead) retain a part of this injurious salt, when they have been badly purified; it is therefore imprudent to procure them from the grocers, who may not understand the manner of performing this purification. It will be said, perhaps, that this is practised daily, and that no serious accidents occur. We grant it; but we have thought it our duty to state the fact, because it may be the cause of accidents.

Treatment.

54. We have shown that Glauber's salt, Epsom salt, gypsum, or well water, are the best

counter-poisons for the salts of lead, for the waters charged with this metal, such as the vegetable mineral water, Goulard's water, white water, and for the wines adulterated with litharge: the effects are precisely the same as of the salts of barytes. The patient should therefore be treated as if he had taken a salt of that kind (see § 46). The livers of sulphur recommended by some practitioners, are dangerous, and ought to be forbidden.

Characters of the preparations of Lead.

55. All the preparations of lead, exposed to a red heat, with potash and charcoal, afford a globule of the metal. A *salt* of lead in solution, or *water* containing the metal, may be detected by pouring into it, 1st, some oil of vitriol (sulphuric acid), which will throw down a white precipitate; 2d, some sulphuretted hydrogen, which will produce a black deposite; lastly, the liquor will have a sugary taste. *Wines adulterated with litharge,* being evaporated in a basin, and the residue calcined in a crucible, the metal will be reduced; they also have a sugary taste.

Effects of the Fumes of Lead, or the Colic of Painters.

56. Painters, plumbers, potters, glass and colour makers, and in general all those who work

in lead and its preparations, who handle them, or who inhale their fumes, are subject to a disease known by the name of *colica pictonum*, and which is truly poisoning by *emanation*. Most frequently the patient experiences in the beginning dull colic pains of short duration, which soon return, and then become insupportable; the mouth is dry; inclination to vomit, and vomiting occur, and sometimes continue several days; the matter thrown up is bitter, greenish or blackish; an obstinate constipation exists: the stools are extremely difficult and painful, and the excrements are yellow, hard, rounded, and resembling those of horses or sheep; sometimes on the contrary, laxativeness occurs; the belly sinks, particularly near the navel, and seems to be applied against the back bone: this effect is more remarkable in proportion as the colic pains are more intense. Very often the pains of the belly are diminished by pressing gradually the navel with the hand; fever is scarcely ever observed, and the patient very rarely complains of pains of the head, vertigo, &c. In some circumstances, though very rarely, these symptoms, far from showing themselves in a gradual manner, come on with the greatest rapidity and violence.

Treatment of the Colic of Painters.

57. Experience has proved the great efficacy of the method employed at L'hopital de la Charité of Paris. It consists:

1st Day.

Purgative Clyster.

In the morning, a clyster is given, prepared by boiling for ten minutes four ounces of senna leaves in half a pint of water, and adding to the liquor when strained, half an ounce of Glauber's salt (sulphate of soda) and four ounces of antimonial wine; in the course of the day the following drink should be given:

Purgative Drink.

Boil for a quarter of an hour, two ounces of cassia fistula broken up, in a pint of water, strain, and add an ounce of Epsom salt (sulphate of magnesia) and three grains of tartar emetic. If the disease be very powerful, an ounce of the syrup of buckthorn, and two drachms of the confection of Hamech are to be mixed with this drink.

Anodyne Clyster.

An anodyne clyster is given in the evening, composed of six ounces of sweet oil, and twelve

ounces of red wine, and internally a drachm and a half of treacle, to which is sometimes added a grain and a half of opium.

2d Day.

Emetic.

Early in the morning, six grains of tartar emetic dissolved in a large glass of water, are given in two doses at an hour's interval; and, to facilitate vomiting, the patient should drink freely of warm water sweetened with honey. In the course of the day, after the emetic has ceased operating, he must make use of the following

Sudorific potion.

Boil for an hour, in three half pints of water, an ounce of guaiacum, and as much china root and sarsaparilla; an ounce of sassafras and half an ounce of liquorice are then added; the boiling is gently continued for a few minutes, and the liquor strained.

In the evening, the anodyne clyster, and the treacle with opium are given, as on the first day.

3d Day.

Gently purgative potion.

In the morning of the third day, the following potion is given in four doses, at intervals of

three quarters of an hour: an ounce of the leaves of senna are boiled for some time in a pint of the sudorific potion of the second day, and then strained. The rest of the day, the patient takes of the simple sudorific potion, and in the evening the anodyne clyster, the treacle and opium, as on the first day.

4th Day.

Purgative drink.

In the morning, the following purgative drink is given: half an ounce of Glauber's salt, a drachm of powdered jalap, and an ounce of the syrup of buckthorn, are put into a glass of a decoction of senna, prepared by boiling a quarter of an ounce of senna leaves in a glass and a half of water, until it is reduced to a glass, and then strained. In the course of the day, the patient takes the sudorific potion of the second day. In the evening, the anodyne clyster, as well as the treacle and opium, are given, as on the first day.

5th Day.

In the morning, the gently purgative potion of the third day is administered; at four o'clock, the anodyne clyster of the first day; at eight o'clock, the treacle and opium.

6th Day.

The same treatment as on the fourth. If, notwithstanding all these means, the patient does not evacuate, the following boluses are given:

Purgative Boluses for Painters.

Ten grains of scammony, as much resin of jalap, twelve grains of gamboge, and a drachm and a half of the confection of Hamech, are mixed with a sufficient quantity of syrup of buckthorn: this is made into twelve boluses, one of which is given every two hours; in the intervals the patient should drink of the sudorific potion. It is very rare that a treatment of this kind fails of curing the disease. If the drinks prescribed are vomited, an emetic should be given, prepared by putting a grain of tartar emetic in a pint of water.

Irritating Vegetable Poisons.

Aconitum napellus, or cœruleum, large blue monk's-hood, large blue wolf's bane, wolf-wort, libbard's bane, and anthora.
Anemone pratensis, meadow-anemone, flora's bell, wind-flower, &c.
(Brionia dioïca) bryony, white jalap.
Chelidonium majus, celandine.
Clematitis, climber.

Colchicum autumnale, meadow saffron.
Convolvulus scammonia, scammony, purging bind-weed.
Cucumis colocynthis, coloquintida, bitter-apple.
Daphne gnidium, chymelœa } *spurge-laurel.*
Daphne mezereum, mezereon }
Delphinium staphysagria, staphis-agria, staves-acre, pedunculatia.
Euphorbium officinarum, euphorbium.
Euphorbium lathyris, spurge.
Frittillaria imperialis, crown imperial.
Gratiola officinalis, water-hyssop, hedge-hyssop.
Gutta-gamba, gamboge.
Helleborus niger, black hellebore, christmas flower, bear's foot.
Jatropha curcas, Barbadoes-nut.
Juniperus sabina, savine or sabine.
Momordica Elaterium, wild or squirting cucumber.
Narcissus pseudo-narcissus, meadow-narcissus. daffodil.
Ranunculus acris, crow-foot, herba scelerata.
Ricinus palma christi, palma christi, castor-oil plant.
Rhus radicans, or toxicodendron, poison vine. poison sumach.
Scilla maritima, squill, sea-onion, sea-daffodil.
Sedum acre, jubarb, house-leek, Jupiter's beard. wall-pepper, sengreen, sedum.

Effects of the irritating Vegetable poisons.

58. An acrid, biting, more or less bitter taste, burning heat, and great dryness of the tongue and other parts of the mouth, painful constriction of the throat, inclination to vomit, evacuations by vomiting and by stool, efforts to vomit, even when the stomach is empty, more or less acute pains in the stomach and bowels, pulse strong, frequent, and regular; respiration difficult and accelerated; the gait becomes very often tottering, the patient appears drunken; pupil of the eye dilated; he falls into such a state of depression that one would think him dead; the pulse becomes slow, loses its force, and death ensues. Some of these poisons occasion more or less violent convulsions, stiffness of the limbs and acute pains which cause the most plaintive cries. The poisonous properties of these plants vary much in power; the greater number may even be useful to man in certain diseases, if administered with prudence.

Treatment.

59. The treatment of persons poisoned by the irritating plants, does not differ in many cases, from that of which we have spoken in the article *Corrosive sublimate*, except that there is no advantage in giving the white of

eggs; the same conduct should be observed that is indicated § 17, avoiding scrupulously the administration of tartar emetic, vinegar and other irritating drinks, which would only serve to augment the disease.

It sometimes happens that the poison swallowed does not occasion very great pains of the belly, but induces vomiting, depression, and very remarkable insensibility; in this case, after having promoted vomiting by sugared water, several small cups of coffee are to be given, prepared by pouring a pint of boiling water upon eight ounces of powdered coffee, leaving it to infuse for half an hour, and straining; three or four grains of camphor are given at the same time in the yellow of an egg. If the stomach reject the coffee, it should be given as a clyster, or by friction. It is also necessary to examine whether the belly does not become painful; in which case, twelve or fifteen leeches should be applied. When, instead of great depression, there is excitation, convulsions, delirium, &c. after having caused vomiting by means of sugared water, the opiate of which we have already spoken, or else the decoction of poppy heads, should be given, § 7.

Aconitum napellus. The roots, juice, and leaves of the different species of aconitum, monk's-hood, wolf's-bane, &c. produce serious symptoms when taken into the stomach or applied to wounds. The savages formerly poisoned

their arrows with the monk's-hood (*aconitum cammarum*).

Anemone. The roots, young shoots and several other parts of the different species of anemone, are poisonous, even when applied externally. The acrimony of certain species is such, that there are examples of persons being poisoned, and having their eyes inflamed, from having been engaged merely in powdering them. The inhabitants of Kamtchatka employ the wood anemone to poison their arrows.

Bryony. The root of bryony, sometimes administered as a purgative, inflames the stomach and intestines when given in too large a dose.

Celandine. The celandine occasions an inflammation of the parts which it touches.

Clematitis. Several species of clematitis are poisonous when eaten; applied to the skin they cause excoriations.

Colchicum autumnale. The seeds of meadow-saffron are very dangerous; the bulbs also may, in certain climates, produce accidents.

Cucumus colocinthis. The colocinth, wine of colocinth, and other preparations of this kind, so much employed by quacks, and by means of which they pretend to cure a multitude of diseases, ought to be taken with prudence and by order of a physician; for they may injure, and even occasion death, when introduced into the stomach, given in form of clyster, or applied upon the skin.

Bitter-apple. The elaterium, or wild cucumber, sometimes made use of by physicians, may also occasion death, when given in a large dose, for it inflames the stomach and intestines.

Daphne. The mezereon or spurge-laurel, sometimes employed in surgery as a vesicatory, is a very caustic substance, which may produce death, even when applied upon the skin only.

Delphinium staphysagria. The staves-acre, or louse-plant, is not dangerous when only a small quantity is put upon the head; but if a large quantity be employed, or if, by mistake, it be swallowed, it then occasions acute inflammation.

Euphorbium. The greater number of the euphorbiæ yield an acrid, and very poisonous juice, which by mere friction on certain parts of the body, produces inflammation. Taken internally, either by the mouth, or in the form of clyster, they occasion colics, vomiting, &c. and if the remedies indicated §17 be not employed, terminate in death.

Gratiola officinalis. It is much to be desired that patients would so far consider their own good, as to avoid consulting quacks, who fearlessly undertake to cure the most serious diseases. They do not hesitate to administer clysters and drinks of hedge-hyssop, which inflame the bowels and conduct inevitably to the tomb. Unfortunately, we could cite a great many facts in support of this assertion.

Gamboge. Gamboge inflames the parts it

touches, and consequently may occasion death, when swallowed in sufficient quantity.

Hel'leborus. The roots of white and black hellebore are very poisonous, either when eaten, given in a clyster, or applied to wounds, and sometimes even when rubbed upon the sound skin. They always occasion obstinate vomiting and great debility.

Jatropha curcas. The Barbadoes-nut is a powerful caustic, the use of which is consequently very dangerous.

Juniperus sabina. The savine, too often employed by quacks, is very caustic, and may even cause death.

Ricinus palma christi. The seeds of the castor oil plant are very acrimonious and inflame the stomach.

Ranunculus. The same may be said of almost all the ranunculuses.

Rhus toxicodendron. The *rhus radicans,* or poison vine, exhales, particularly during the night and in the shade, a noxious gas: so that persons who touch or pass near it, experience a smarting, swelling, hardness of the skin, and other more or less disagreeable symptoms. On the contrary it appears that its effects are but trifling in the middle of the day, or when it is exposed to the sun.

The history of several other irritating plants may be found in our general treatise on poisons. We have here confined ourselves to a notice of

the most remarkable. (See General Toxicology. 2d edition.)

SECOND CLASS.

Narcotic Stupifying Poisons.

This class contains the following poisons.

Opium.

Black and white hen-bane.

Hydro-cyanic acid (prussic acid) and all the substances which contain it, such as cherry-laurel, the distilled water, oil and extract of the same plant, and of bitter almonds.

Lactuca virosa.

The Solanums, and principally the Hyoscia-mus or hen-bane.

The yew.

Bitter-vetch.

Effects of the Narcotic Poisons.

60. When any one of these poisons has been introduced into the stomach, or applied upon a wound, the following effects are observed: stupor, numbness, heaviness of the head, inclination to sleep, slight at first, afterwards insurmountable; a kind of drunkenness, stupid look, pupil very much dilated, furious or gay delirium; sometimes pain, slight or strong convulsions in some part of the body, palsy of the legs, pulse variable, but in general full and strong in the beginning of the

disease; respiration sometimes a little accelerated; vomiting, particularly when the poison has been applied to wounds, or given in form of a clyster: soon after the convulsions and depression augment, and if relief be not given, the patient dies.

Treatment.

61. If the poison has been introduced into the stomach,* four or five grains of tartar emetic should be given dissolved in a glass of water; if at the end of a quarter of an hour vomiting be not produced, 24 grains of the sulphate of zinc (*white vitriol*) should be dissolved in a glass of water, and given in two doses, at a quarter of an hour's interval, if the first dose has not produced vomiting. If these means do not succeed, three or four grains of the sulphate of copper (*blue vitriol*) may be given, dissolved in a glass of water, always with the intention of expelling the poison either by vomiting or by stool. The success of this remedy should be promoted by introducing the fingers into the throat, and by tickling it with a feather. The emetic should not be dissolved in a very great quantity of water, and the patient should not drink in abundance either with the intention of mitigating the suffering, or of promoting vomiting: far from being useful, it will only aggravate the disease.

* This treatment does not apply to the prussic acid.

Experience has perfectly convinced us that vinegar, lemon juice, and the other acids so much recommended by physicians, *are very hurtful*, before having expelled the poison by vomiting or by stool. If it be supposed that the narcotic has had time to pass into the intestines, the purgative clyster described page 59 should be given.

62. Let us suppose that the patient has vomited, and that the poison has been entirely or almost entirely evacuated; the disease, although less dangerous, would still be mortal, if abandoned to itself. It is therefore necessary to administer alternatively, every five minutes, a cup of water acidulated with *vinegar, lemon juice,* or *cream of tartar*, and a cup of coffee prepared by pouring a pint of boiling water upon eight ounces of good coffee, and straining the liquor ten minutes after. We should try to dissipate the numbness by rubbing the arms and legs of the patient with a brush or a piece of flannel. The use of the coffee and acidulated water should be continued until the patient is out of danger. Sometimes, when the drowsiness is extreme, when the disease resembles an attack of apoplexy, and when, by the means employed, no relief is obtained, we have recourse to bloodletting, either from the arm, or, which is preferable, from the jugular vein.

63. If the poisoning has been occasioned by the application of a narcotic to a wound, instead

of losing time by giving an emetic, the patient must immediately be put upon the use of coffee, acidulated water, &c. See § 62.

Opium. Opium, liquid laudanum, and poppy heads, though advantageously used in medicine, are more or less poisonous: opium particularly is very energetic.

Hen-bane. The roots of black hen-bane, sometimes confounded with the parsnip, have been put into soup, and occasioned the most terrible accidents. The leaves of this plant are also very poisonous. Trembling and intoxication have been observed to occur only from having prepared a plaster composed in part of this root. The *white and golden hen-bane,* &c. are equally poisonous.

Prussic acid. Amongst the known poisons, the prussic acid is beyond contradiction the most energetic: one or two drops of it applied upon the eye, the tongue, &c. are sufficient to destroy the strongest dogs in the space of one or two minutes. Happily, the difficulty there is in preparing and preserving this dreadful poison, renders it excessively scarce, and consequently difficult of attainment for the purposes of crime. The *cherry-laurel,* the water of the same plant several times distilled, the oil, and extract, are equally poisonous, because they contain prussic acid; it is the same with bitter almonds, which have a strong odour, and a very bitter taste.

Treatment.

64. When poisoning has been occasioned by diluted prussic acid,* or by the plants which contain it, vomiting should be excited as in § 61; afterwards the infusion of coffee, mentioned § 62, is to be administered, and three or four spoonfuls of spirits of turpentine at intervals of half an hour in the infusion of coffee.

Lactuca virosa and *solanum.* The lettuce is far from being (in our climate) as dangerous as has been said, and the same is the case with the greater number of solanums.

THIRD CLASS.

Acrid Narcotic Poisons.

This class contains:

1. The mushrooms.

2. The nux vomica, the upas, false angustura, St. Ignatius' bean, the ticunas or American poison, the woorara, camphor, the coculus indicus, or fisher's berries.

3. Tobacco, the great and little hemlock, belladonna or deadly night-shade, stramonium, foxglove, the rose-bay, rue, darnel or tares, the mancanilla or hippomane, and the aristolochia.

* When the concentrated acid is taken, death takes place so suddenly that there is no time to give the least assistance.

4. Wines, alcohol, ether, all the spirituous liquors, and consequently intoxication.

5. Emanations from flowers.

6. Spurred rye.

We will examine the effects of these poisons in the three following paragraphs.

§ I.

OF POISONOUS MUSHROOMS.

The principal venomous mushrooms are: 1. *Agaricus muscarius,* L.; *Agaricus pseudo-aurantiacus,* Bulliard; 2. *Agaricus bulbosus,* B.; 3. *Agaricus bulbosus vernus,* B.; 4. *Agaricus conicus,* Picco; 5. *Agaricus necator,* B.; 6. *Agaricus acris,* B.; 7. *Agaricus pyrogalus,* B.; 8. *Orange Cross of Malta;* 9. *Fungus minimus tctus niger umbilicatus,* Vaillant; 10. *Amanita fasciculosa pileis rufo fuscis,* Dillen; 11. *Ivory white;* 12. *Fungus parvus piperatus lacteum succum fundens,* Micheli; 13. *Fungus perniciosus intense Aureus,* M.; *Fungus infundibulum referens albus,* Buxbaum; 15. *Grand Moutardier;* and all the acrid, caustic, and styptic agarics.

Effects of the Poisonous Mushrooms.

65. The effects produced by mushrooms vary a little according to the species which occasions them; but, in general, they may be reduced to the

following: griping pains, inclination to vomit, vomiting and stools, heat of the stomach, languor, acute and almost continual pains, cramps, convulsive movements of some part of the body, devouring thirst; pulse small, hard, tense and frequent. In certain circumstances a kind of intoxication is observed, a low delirium and sort of lethargy into which the patients are plunged until the pains or convulsions awaken them; sometimes, far from being drowsy, the unhappy individuals preserve all their intellectual faculties; pains and terrible convulsions, faintings and cold sweats exhaust the strength, and soon terminate in death. In general, the effects of these mushrooms do not manifest themselves until five, seven, twelve, or twenty-four hours after they have been eaten.

Appearances which render Mushrooms suspicious.

66. Mushrooms which grow in the shade and in thick forests, where the sun never penetrates, are in general very poisonous. Their surface is humid, more or less dirty, and their appearance ugly. It is the same with those which are heavy, with a wet surface, a nauseous odour, which issue from an envelope, and which, being cut, present several colours, or often change shades. Those which have been bitten by insects and abandoned, ought to be rejected. The same may be said of

those which grow quickly and rot easily, as well as of those which have soft stems, and to the surface of which morsels of skin are found attached.

Treatment.

67. It has been found by experiment that the most poisonous mushrooms, cut in small slices and left for a long time in *vinegar, strong pickle,* or *ether*, lose their poisonous properties; for the vinegar, the salt water, and the ether dissolve all the active part, and are to be regarded as energetic poisons. It follows therefore that in cases of poisoning by mushrooms, these liquids should not be given *until the mushrooms have been evacuated either by vomiting or by stool;* for they would dissolve the poisonous part in the stomach, and the effects would be still more dangerous.

As soon as the symptoms of poisoning by mushrooms are perceived, three grains of tartar emetic should be given in a glass of water; a quarter of an hour after, a second glass of water, in which are dissolved three grains of tartar emetic, three or four grains of *emetine* (for which may be substituted 24 grains of ipecacuanha) and an ounce of Glauber's salt, is to be given in three doses and at intervals of twenty minutes. After having procured copious vomiting, we should endeavour to evacuate the mushrooms which may have passed into the intestines, by means of purgatives. For

this purpose, a table-spoonful of a potion composed of an ounce of castor oil and an ounce and a half of the syrup of peach blossoms, is to be given every half hour; a purgative clyster is also to be administered, prepared by boiling for a quarter of an hour, two ounces of *cassia* broken, half a drachm of *senna*, and half an ounce of *Epsom* salt (sulphate of magnesia,) in a pint of water. If the evacuation does not take place, the clyster must be repeated two or three times. If, notwithstanding the employment of these means, the mushrooms be not evacuated, and if the disease increases, an ounce of tobacco should be boiled for a quarter of an hour in a pint of water, strained, and the liquor given in the form of a clyster: vomiting always follows the administration of this medicine.

After having evacuated the poison, the patient should take a few spoonfuls of a potion composed of four ounces of orange-flower water, a quarter of an ounce of ether or of Hoffman's anodyne liquor, and two ounces of common syrup, or, which is better, of syrup of orange-peel.

If the disease, instead of subsiding, make new advances, and if the patient complain of acute pains of the belly, sugared water, gum water, linseed or mallows tea, should be prescribed; cloths wetted with one of these liquids should be applied upon the painful part, and the individual placed in a bath. If the pain still continue, ten

or twelve leeches must be applied upon the most sensible part of the belly, and the same conduct pursued that has been directed in speaking of acrid poisons, § 59.

If before the patient has received any assistance there should be much fever, and the belly should be swelled and very painful, the tongue dry and thirst excessive, accompanied with a burning heat of the skin, mouth, and throat, the strong purgatives which we have recommended should be abandoned; in this case the patient should be blooded, leeches should be applied to the belly, and fomentations and clysters of linseed tea should be employed.

§ II.

OF THE NUX VOMICA, THE UPAS TIEUTÉ, ST. IGNATIUS' BEAN, FALSE ANGUSTURA, UPAS ANTIAR, THE AMERICAN POISON, CAMPHOR AND COCULUS INDICUS.

Effects of these Poisons.

68. Introduced into the stomach, or applied to wounds, these poisons are rapidly absorbed, and act upon the brain or spinal marrow near the neck; they occasion a general and convulsive stiffness; the head is drawn back upon the shoulders, the chest scarcely dilates, the respiration ceases or is very irregular, and the patient dies asphixied: death even takes place in the space of a few minutes, if the poison has been

employed in a strong dose. None of these substances inflame the parts which they touch. The effects of some of them are not continual, since they occasion more or less frequent accessions, in the intervals of which the poisoned individual appears little affected.

Nux vomica. The nux vomica, which enters into the composition of the forced meat balls with which dogs are killed in the streets of Paris, is poisonous to man, although the contrary is advanced by some physicians. It should therefore be used with prudence.

Upas Tieuté. The upas tieuté or bohon upas is the juice of a plant of Java, with which the natives poison their arrows in order to render wounds by them mortal. It is difficult to form an idea of the promptitude with which these poisoned arms occasion death.

Upas Antiar. The upas antiar is the juice of a tree which does not grow in Europe, and which the Indians employ to poison their arrows; it is very active when introduced into wounds.

Ticunas. The ticunas, or American poison, is an extract, prepared by the Indians from the juice of certain plants, and particularly of certain species of convolvulus. When dry, it may be respired and put upon the eyes without danger; the vapours which it diffuses when thrown upon burning coals are not poisonous. It is very dangerous when applied to deep wounds, espe-

cially if the part of the arrow which contains it be previously dipped into hot water.

Camphor. Camphor is a salutary remedy in a multitude of circumstances, and few physicians regard it as poisonous; it is however established, that when dissolved in oil or any other substance, and administered in sufficient quantity, it may occasion serious symptoms which are followed by death.

Coculus Indicus. The fisher's berry, and especially the *picrotoxine*, which is the active part, is poisonous to man, fishes, birds of paradise, goats, wild cattle, crocodiles, &c.

Treatment.

69. When a physician is called to attend an individual who has taken internally one or other of these substances, he should give an emetic, (see § 67,) and tickle the throat to encourage vomiting; he should afterwards oppose the asphixia or apathetic state of the system, which is the principal cause of death; for this purpose, air should be blown into the lungs, and the treatment pursued as indicated in the article Asphixia, § 104. He should administer internally, every ten minutes, a spoonful of a potion composed of two ounces of water, a drachm of ether, two drachms of spirit of turpentine, and half an ounce of sugar.

70. If the poison has been applied to a wound, or if it has been introduced by means of an arrow, he must begin by withdrawing these; the wound should then be burnt with an iron heated to a white heat, and the limb strongly tied above the wounded part: if the patient be robust he should lose some blood. He should take the potion of ether and turpentine of which we have just spoken § 69. Finally, the asphyxia must be opposed by blowing air into the lungs (see Asphyxia § 104). Salt water, employed by the Indians and regarded by them as the counter-poison of those poisonous substances, should be rejected.

§ III.

OF TOBACCO, BELLADONNA, STRAMONIUM, FOX-GLOVE, ROSE-BAY, RUE, GREAT AND LITTLE HEMLOCK, DARNEL, MANCANILLA, SPURRED-RYE.

Effects of these Poisons.

71. The poisons of this section, introduced into the stomach or applied to wounds, give rise to the following symptoms; agitation, pain, piercing cries, a kind of delirium more or less gay, convulsive movements of the face, jaws and limbs; the pupil is dilated, the pulse strong, frequent and regular, or small, slow and irregular; retchings,

obstinate vomitings, stools, more or less acute pains of the belly; sometimes instead of great agitation, a kind of intoxication is observed, accompanied with great depression, insensibility, general trembling, and no inclination to vomit.

Treatment.

72. If the poisoned person has not vomited, an emetic should be given, as advised in speaking of opium, § 61. If the poison has been swallowed a long time, the purgatives spoken of in the same paragraph should be administered. If after having had copious evacuations by vomiting and by stool, the patient should appear to be in a profound stupor approaching to apoplexy, blood should be drawn from the arm, or preferably from the jugular vein: acidulated water should then be given as for opium; this remedy would be hurtful before having evacuated the poison. On the contrary, twelve leeches should be applied to the belly. If the pain of this part be acute, the patient should drink sugared water, linseed or mallows tea; in a word, the same conduct should be observed, that has been recommended in speaking of acrid plants, § 59.

Tobacco. It is very important to make known the effects of tobacco, in order to avoid the dangers to which it may give rise. Intoxication and vomiting have been observed in children on

whose heads a liniment composed of powdered tobacco and butter had been applied. The same effects have sometimes arisen, from having washed the parts affected by the itch with a decoction of tobacco. It is even asserted that an individual died from having taken by the nose too great a quantity of snuff. The dangerous effects of this substance, when applied to wounds, are known to every one who has observed them with attention. Introduced into the stomach, tobacco purges, excites vomiting, tremblings, convulsions, and may even occasion death, as is proved by the instance of the celebrated Santeuil.*—*Treatment*, see § 72.

Belladonna. The deadly night-shade is a very energetic poison; its fruit, when ripe, resembles the black grape, for which it has often been taken, producing the most disastrous results. It is distinguished from the grape by being divided into two parts internally, whilst the grape has only one. This poison is one of those which frequently occasion a cheerful delirium accompanied with a simple smile.

Datura Stramonium. The stramonium is very poisonous; a decoction of the fruit or seeds of this plant, taken internally, has been known

* I have seen one instance of death produced by a decoction of a drachm of this substance given in clyster, in a case of strangulated hernia.—*Note by the Translator.*

to produce the most furious delirium, convulsions, palsy, tremblings, and even death.

Purple Fox-glove. The powder of fox-glove, its watery and resinous extracts, and its tincture, are energetic poisons, even when applied to wounds. These preparations give rise to abundant vomitings, which are soon followed by great depression, and death, if the assistance, of which we have spoken § 72, be not administered.

Nerion Oleander. It is perfectly proved that the rose-bay introduced into the stomach, or applied to wounds, is poisonous to man, horses, sheep, dogs, &c. It is even said that an individual died from having been shut up in a chamber to sleep where there were flowers of this plant. This poison occasions vomiting, inflammation of the parts it touches, and stupefaction of the brain.

Rue. Rue, in a considerable dose, occasions agitation, fever, sore throat, and inflammation of the parts upon which it is applied. Its essential oil is much more active.

Great Hemlock. The great hemlock is very poisonous in hot climates; it is even considerably so in temperate countries, provided it be gathered when at perfect maturity. It is easily recognised by its stalk, which is cylindrical, and towards the ground covered with purple brown or blackish spots. It occasions death even when put upon wounds.

The *aquatic* or *virulent hemlock*, is still more energetic than the preceding.—*Treatment*, see § 72.

Little Hemlock. The little hemlock is often confounded with parsley: it may be distinguished by the following characters: 1st, its leaves are of a blackish and shining green above; 2d, they have no odour, when smelled without being bruised: on the contrary, when rubbed between the fingers they impart a nauseous odour. The little hemlock is very poisonous; it occasions vomiting, intoxication, or delirium, numbness in the limbs, &c.

Darnel. Bread, containing a considerable quantity of darnel, gives rise to dangerous illnesses: the person affected experiences general or partial tremblings of the body, a sort of intoxication, almost continual tinkling in the ears, great heaviness of the head, often accompanied with pains of the forehead; and also much difficulty in speaking and swallowing. The respiration is difficult, the stomach painful, with inclination to vomit. These symptoms are soon followed by drowsiness.

Acidulated water, lemonade, or orange-flower water, with honey and vinegar, are to be administered.

Mancanilla. The fruit of the manchineal tree yields a very poisonous juice, which inflames the bowels, and which the natives have made use of

to poison their arrows. The rain which has washed the leaves and branches of this plum produces blisters like boiling water. Negroes have been seen to have the hands and face swelled and burnt in consequence of splitting a small branch of this tree. It is even pretended, (but wants confirmation,) that its shade occasions swelling in those who repose under it.

Intoxication. Wine, spirit of wine, spirituous liquors, ether, &c. if taken immoderately, produce intoxication; it may even be produced by the vapours of alcohol. The symptoms of ebriety, so generally known, almost always dissipate of themselves at the end of ten, twelve, or fifteen hours; but as this may not be the case, and as the disease then presents some danger, we think it our duty to describe the means of opposing it. Two or three grains of tartar emetic dissolved in a glass of water, should first be given, followed by warm water, and the throat is then to be tickled to encourage vomiting: when the patient vomits, he should drink every ten minutes half a glass of water, in which a table-spoonful of vinegar or of lemon juice has been mingled; a purgative injection is administered, prepared as directed § 57; the whole body is to be rubbed with cloths dipped in vinegar. If, notwithstanding this treatment, the drowsiness continue or augment, and if the patient be robust, he should be bled, or, which is better, have a dozen leeches applied to the neck.

ODOURS AND EMANATIONS FROM FLOWERS.

Those persons who live with impunity in apartments filled with odoriferous flowers, will with difficulty be persuaded that it would be impossible for certain individuals to remain even a few minutes in them without experiencing disagreeable symptoms, such as headachs, inclination to vomit, fainting, convulsions, &c.: experience proves, however, that such is the fact. The odour of the rose, the carnation, the honey-suckle, &c. have sometimes occasioned the effects described. The odour which is occasioned by powdering the black hellebore and coloquintida, have produced in some circumstances purgative effects; and historians relate instances of certain great persons having been poisoned by perfumed gloves, or by the vapour exhaled from poisoned torches.

Treatment.

The patient should be taken out of the apartment containing the flowers, and placed in the open air: he should inhale the vapour of vinegar, and drink sugar and water. If he be in a state of asphyxia, he must be treated as we shall direct § 104. If he has convulsions, he must take the antispasmodic potion, described § 6.

OF SPURRED RYE.

Characters.—Rye is subject to a disease which changes its form and composition, and renders it poisonous. It becomes covered with a violet coloured substance, which is curved, and elongated in the form of a spur or horn: the name of spur is given to this, and the rye is said to be spurred. The spurred grains break easily, and snap off short with a slight sound, like that of a dry almond. When they are reduced to powder, they have a disagreeable odour, and an acrid taste, like that of rotten grain. The bread containing spurred rye presents spots or points of a violet colour: and the paste has even sometimes a shade of the same colour.

Effects produced by a small quantity of Spurred Rye.

When bread contains a small quantity of spurred rye, the following effects are remarked:* The disease begins by an uncomfortable pricking sensation of the feet; an acute pain of the

* These effects have been described by J. A. Srine, and were observed in the epidemic disease which devastated the country of Wurtemburg in Bohemia, in 1736.

stomach, with inclination to vomit, soon succeed; it is not long before the hands and head are affected; the fingers are contracted to such a degree, that the strongest man is scarcely able to straighten them, and the joints are as if luxated. The patients utter the most piercing cries, and are tormented by a fiery heat, which burns their feet and hands. After these pains, the head becomes heavy, the patient appears intoxicated, the eyes are covered with a thick cloud, so that some individuals become blind, or see double; the intellectual faculties are so deranged, that mania, melancholy, or drowsiness ensues; the intoxication augments, the body is drawn backwards and forms an arch, of which the convexity is forward; the mouth contains a yellow, greenish, or almost bloody froth; the tongue is often torn by the violence of the convulsions; it sometimes swells to such a degree as to intercept the voice, obstruct the respiration, and produce a profuse salivation. These symptoms are followed by a voracious appetite, and the patient rarely has an aversion to food; sometimes, but more rarely, spots are observed upon several parts of the body.

Effects produced by a great quantity of Spurred Rye.

When the spurred rye has been taken in large quantity, or been made use of for a long

time, the disease commences by a very acute pain, with intolerable heat of the toes. The pain ascends, pervades the foot, and gains the leg. The foot soon becomes cold, pale, and afterwards livid. The coldness ascends the leg, which is very painful, and the foot becomes insensible. The pains are more acute at night than during the day; thirst is experienced, the appetite continues, and the natural functions are performed with regularity. The patient cannot move nor support himself upon his feet. Violet spots, with blisters, soon make their appearance; gangrene shows itself with all its horrors, and ascends as high as the knee. The leg separates at the joint, leaving a healthy vermillion-coloured wound, which readily closes, unless the patient, badly nourished, exposed to cold and humidity, and lying upon a bed infected with gangrenous matter, absorb new putrid miasmata. (Letter from M. François to the editor of the Gazette de Santé.)

Treatment.

If the disease be slight, with only a little fever, confusion of ideas, and some convulsive movements, four or five spoonfuls of the antispasmodic potion, prescribed § 6, should be given, and the patient should drink of water acidulated with vinegar, or lemon juice.

If the pains, and the numbness and cold which

succeed them, announce the approach of dry gangrene, it should be prevented if possible. The patient ought to be placed in a dry warm apartment, and in a very clean bed, the covering of which should be frequently changed.

Several physicians have recommended the administration of tartar emetic when the mouth is bitter, the tongue covered with mucosity, with frequent inclination to vomit. Experience proves, however, that this medicine increases the irritation, and may occasion a diarrhœa, which is always to be dreaded. Nevertheless, as it is sometimes necessary to give an emetic to remove the above-mentioned symptoms, recourse should be had to ipecacuanha; three glasses of boiling water, are poured upon a drachm of ipecacuanha; ten minutes after, the liquor is to be strained. If the first glass occasions abundant vomiting, the others are not to be given. The effects of this vomit are to be encouraged by drinking warm water.

If the patient should complain of numbness and cold of the limbs, he should be placed in a bath of a decoction of aromatic plants, such as lavender, rosemary, and sage, with the addition of vinegar; in quitting the bath, the foot and leg should be rubbed with the hand or with flannel; they should be covered with compresses dipped in an infusion of elder or orange flowers, to which is added fifteen or twenty drops of volatile alkali

to each glass. These compresses might equally well be dipped in common ley, or in the following decoction, of which three glasses a day should be given to the patient internally. Boil for a quarter of an hour four ounces of *powdered bark* (Cinchona) in a pint of water; at the end of this time, half an ounce of *sal ammoniac*, and two pinches of *chamomile* flowers are to be added; the whole is left to cool and strained. A lotion of the infusion of *arnica*, or of Virginia snake-root, sweetened with the syrup of vinegar, or oxymel, may also be given with success.

If the numbness and cold remain, large blisters should be applied near the benumbed parts; finally, if nothing can prevent the gangrene, the following fomentation should be applied several times a day. Boil in a pint of water until reduced to half a pint, four ounces of burnt alum, three ounces of blue vitriol, and one ounce of common salt. If the gangrene make such progress that amputation becomes necessary, we must wait until nature has established a line of separation between the living and dead parts, which indicates the place where the operation should be performed.

Amputation should only be performed either when the gangrene has stopped in the middle of a limb, which it has mutilated in an irregular manner, so that the sound part might become an obstacle to its movements after the cure;

or, when the gangrened parts do not separate with sufficient promptitude, but putrify and infect the patient.

FOURTH CLASS.

Septic or Putrifying Poisons.

This class comprises the following poisons:

1. That of the viper, and of all the venomous animals whose bite or sting is accompanied by more or less serious symptoms.
2. Animals which may become fatal from being eaten.
3. The malignant pustule and madness.

§ I.

VENOMOUS ANIMALS WHOSE BITE OR STING IS ACCOMPANIED WITH MORE OR LESS SERIOUS SYMPTOMS.

These animals are:

The *viper* (*coluber berus.* L.)

The viper *naia* or *cobra de capello* (*coluber naja.* L. *vipera naia.* Daudin.)

The elegant viper of Daudin (*katuka rekula poda of the Indians.*)

The *rodroo pam* of the Indians.

The *gedi paragoodoo* of the Indians.

Rattle snakes.

Several *insects,* such as the *scorpion, spiders,* the *tarantula,* the *honey bee,* the *humble bee,* the *wasp,* the *hornet,* the *gad-fly,* and the *fly.*

Effects produced by the bite of Vipers and Rattle Snakes.

73. When the body is bitten by one or other of these animals, an acute pain is felt in the wounded part, which soon spreads into the whole limb, and afterwards into the interior of the body: the swelling which now appears is at first hard and pale, afterwards reddish, livid, and as if gangrenous; it increases and extends by degrees to the neighbouring parts; faintings, vomitings, and convulsive movements afterwards occur, and are sometimes followed by jaundice; the stomach is so sensible that it scarcely retains any thing; the pulse is frequent, small, tense, and irregular; the respiration difficult; copious cold sweats, derangement of vision, and of the intellectual faculties, ensue. The blood which at first flows from the wound is blackish; some time after a fetid humour issues; but when the swelling is considerable, the small vessels do not admit of the passage of blood. The skin which covers them becomes cold, and the pulse is scarcely sensible. When the symptoms enumerated have acquired greater intensity, inflammation and suppuration manifest themselves in the wounded part, and when the abscess is very considerable, the patient dies.

Fontana has said that the bite of the common viper is never mortal to man; this assertion is

not correct, for the viper of Fontainbleau has often caused death.

Treatment of the bite of Vipers and other Serpents.

74. In the first place a *moderately tight* ligature should be applied immediately above the bite; it should not be of twine or any other substance so fine as to irritate the skin, neither should it be continued too long, as it would augment the lividness, and tend to induce gangrene. The wound should be left to bleed, and even be gently pressed, in order to get rid of the venom. If it be possible, the bitten part should be dipped for some time into warm water; and afterwards gently pressed and wrapped up in a wet cloth.

If the disease be violent, the swelling considerable, the pain very acute, &c. the ligature must not be used, its only object being to retard, by obstructing, the circulation of the blood. We must also carefully avoid making incisions and scarifications, which often aggravate the symptoms. The wound should be cauterised with the *hot iron*, the *lunar* or *common caustic*, the *butter of antimony*, &c.

Caustics.

75. *Hot iron.* A piece of iron larger than the wound should be heated to a white heat, and the part burned with it; the pain will be less and

the success more certain, in proportion to the heat of the iron.

Lunar caustic. This caustic is to be broken up and reduced to powder, and applied upon the whole surface of the wound; it is then to be covered with lint, a tight bandage applied, and at the end of five or six hours the whole is to be removed.

Common caustic. It should be employed in the same way as the preceding.

Butter of antimony. This caustic, which, after the hot iron, is preferable to the others, is applied in the following manner: a pencil or brush made of ravelled lint is tied to the extremity of a small piece of wood; this is to be dipped into the butter of antimony, and applied upon the whole surface of the wound; this operation is to be repeated several times, taking care to press more especially upon the parts to be cauterised the most deeply; a roll of lint is afterwards to be applied upon the wound, surrounded by loose lint and secured by a bandage.

Oil of Vitriol. This caustic is applied in the same manner as the preceding.

The *Ammoniacal caustic* of M. Gondret. Half an ounce of tallow and as much oil of olives or of sweet almonds, are gently heated in an open mouthed bottle, an ounce of volatile alkali is added little by little, and the mixture stirred until it becomes solid. This ointment is then to be

spread upon a bit of linen to the thickness of one or two lines, and applied to the wound; it is to be confined by a bandage, during a quarter or half an hour.

Common ley. It is not only necessary to wash the wound with this ley, but to cover it with lint dipped therein, and secured by means of a bandage; this application should be removed at the end of four or five hours.

Quick lime and soap. Make a paste of an ounce of soft soap, and as much quick lime reduced to powder; this paste is to be applied in the same way as the caustic of Gondret.

Moxa. The moxa is a cylinder of linen filled with cotton, which is to be placed upon the wound, and the upper part lighted by a live coal, and blown until it is entirely consumed.

Boiling oil. The wound may be cauterised with boiling oil; but it must only be applied by means of a funnel forcibly pressed upon the circumference of the wound, in order to prevent the cauterisation of the neighbouring parts.

If, after having used one or other of these caustics, the symptoms should not diminish, the wound should be enlarged with a bistoury, and cauterised anew and more deeply.

External treatment continued.

75.* A mixture of one part of volatile alkali and two parts of oil, is to be applied upon the

swelled parts around the wound. When the chief symptoms are very much diminished, the caustic is to be removed, and a compress soaked in olive oil, to which a few drops of volatile alkali are added, used in its place. Soon after the wound presents no kind of danger, and ought to be cured as a simple wound by the application of lint.

Internal Treatment.

76. The object here is, to favour perspiration and sleep. Immediately after the accident, and whilst the external treatment is in progress, the patient should take a glass of orange-flower or elder water, containing six or eight drops of volatile alkali; this drink should be renewed every two hours. A small glass of Madeira or Sherry wine may also be administered. The patient should be placed in bed and well covered, and if he perspire he should be carefully excluded from the cold. Ipecacuanha or tartar emetic should be administered, as we have directed § 61. If bilious vomiting or jaundice make their appearance, or if gangrene advance, the potion of quinquina or bark, indicated page 88 in speaking of spurred rye, should be given. If on the contrary, the disease diminish, and the patient is near a convalescent state, no solid food should be given for some days; two or three light soups, and in small quantity only, is all that should be permitted.

77. If the bite has only occasioned a slight dis-

ease, as inconsiderable swelling, without inclination either to vomit or fainting, it is only necessary to separate the lips of the wound with caution, and pour in one or two drops of volatile alkali; it is afterwards to be covered with lint dipped in the same alkali, and retained by means of a bandage; the limb should be gently rubbed with warm olive oil, and wrapped up in cloths dipped in it.

78. The patient is to take internally every two hours a glass of orange-leaf water, or of that of elder or chamomile flowers, to which has been added five or six drops of volatile alkali.

Remedy which appears very efficacious.

Several countries of America produce a plant called *guaco,* employed by the Indians as a remedy for the bite of the numerous serpents which infest those countries. They swallow one or two table-spoonfuls of the juice of this plant, and inoculate themselves with it by inserting it into five or six wounds made on purpose upon the sides of the chest and between the fingers. They can then take with impunity the most venomous serpents, and if by chance they be bitten by them, the disease disappears as soon as they have rubbed the wound with the same plant.

Successful use of Arsenic in these cases.

Several experiments and some observations tend to prove that the following potion is extremely useful in these cases. A grain of white arsenic (deut-oxide of arsenic), a grain of potash, and three table-spoonfuls of water, are boiled for a quarter of an hour; the liquor is left to cool; an ounce and a half of peppermint water, ten drops of the tincture of opium, and half an ounce of lemon juice, are then added. This potion is given at one dose, and repeated every half hour during four successive hours, if the disease be violent; a purgative injection, like that mentioned § 57, is administered, and the wounded parts rubbed with the following liniment:

Oil of turpentine . .	half an ounce
Volatile alkali . . .	half an ounce
Olive oil	an ounce and a half.

OF THE SCORPION.

79. The sting of European scorpions is seldom dangerous: it occasions serious accidents only in warm climates, and during the great heat of summer. It produces a red spot of the size of the nail, which increases and becomes black in the centre: the black spot is where the sting entered. The symptoms are, pains, a more

or less considerable inflammation, swelling, and sometimes pustules, chills, fever, numbness, vomiting, hiccough, trembling, &c.

Treatment.

80. The internal treatment is the same as that for the viper. See § 78. Cataplasms should be applied externally, composed of linseed meal and decoction of marsh-mallows, or of bread and milk; these cataplasms should always be sprinkled with ten or twelve drops of volatile alkali.

OF THE HONEY BEE, THE HUMBLE-BEE, THE WASP, THE HORNET, THE GAD-FLY, THE FLY, THE TARANTULA, AND THE MOSQUITO.

81. In general, the sting of these insects in our climate, only occasions a more or less acute pain, with swelling, and a little fever. It is sufficient in this case to rub the part with a mixture, prepared by shaking in a bottle two table-spoonfuls of the oil of sweet almonds and one of volatile alkali. The patient should drink of the potion prescribed in speaking of the viper, § 78. If the insect has eaten of poisonous plants, of animals which have died of pestilential diseases, or of any other purulent matter, or if it belong to a very warm climate, the symptoms may be

much more serious, resembling more or less those of the bite of the viper, (see § 73,) and may occasion death: it is necessary in this case to cauterise the part, and to pursue the same conduct which we have directed in the article Viper.

82. After the sting of the honey or humble-bee, if there be a little tumour with a hard white centre, independent of the treatment recommended in speaking of the viper, we must try to extract the sting, either with the point of a needle or with small forceps: we are sometimes obliged, in order to extract it, to cut off with the scissors all that is outside of the wound. When the sting is withdrawn, the wound is to be washed with cold water, or, what is better, with salt water: the liniment of § 75* is afterwards to be applied and covered with a compress dipped in salt water. Recourse should also be had to this liniment even when the sting is not withdrawn. If the patient has been attacked by a troop of mosquitoes, if the stings are very numerous, accompanied by fever, he should be put to bed, and take every quarter of an hour a cup of the infusion of orange leaves, to which has been added four or five drops of volatile alkali.

83. The *dorade* or *dolphin* (coryphœna hippurus. L.), the *conger-eel* (muræna conger. L.), the *scomber* or *mackarel* (scomber scombrus. L.), the *cailleux-tassard* of the *Antilles* (clupia thrissa, of Bloch.), several other fishes and *muscles* (mytilus edulis. L.), may occasion in certain circumstances, more or less serious accidents; some of them have been known to cause death. If experience prove that these animals are sometimes poisonous, it also demonstrates that they are not always so and to every body. An individual who can eat them with impunity in our climate at all seasons, may be very much incommoded by them in very warm countries, especially in summer. The muscles or limpets, which frequently serve as food to entire colonies, will very much affect one person, whilst they will cause no injury to another.

Effects of poisonous Fishes.

The *Dolphin* has sometimes occasioned a violent pain of the head, inclination to vomit, red spots upon the skin, an insupportable itching, and constriction of the chest.

The *Conger* has produced gripings, vomitings, stools, faintings, convulsive twitchings, and palsy

of the limbs. The patients perceived a coppery taste, and thought that their throats were torn.

The *Cailleux-tassard* has occasioned dreadful convulsions, inflammation of the stomach, and, in less than half an hour, even death.

Effects of Muscles.

Muscles have often produced irregular chills, an acute pain of the stomach and head, with oppression and difficulty of breathing; general inquietude, redness and swelling of the face and eye-lids, very acute itching upon every part of the body, an eruption of pustules resembling those produced by nettles, and which appear especially upon the shoulders, convulsions, and sometimes a sudden stoppage of the nose; the patient seems to have a violent cold of the head. In some cases, though rarely, these symptoms have been followed by death.

Treatment of poisoning by animals which have been eaten.

84. An emetic should first be given, see § 61. If the poison has already been swallowed a long time, a purgative and clyster of the same nature should be given, see § 57. Immediately after the operation of these remedies, some pieces of sugar are to be given containing twenty or five

and twenty drops of *ether;* some spoonfuls of the antispasmodic potion mentioned § 6 are administered, and for habitual drink, water is given containing two spoonfuls of vinegar or lemon juice in each glass. If the pains of the stomach continue and are very acute, accompanied with fever, ten or twelve leeches should be applied to the belly.

OF THE MALIGNANT PUSTULE OR PIMPLE.—OF THE MALIGNANT CARBUNCLE.

Causes.

85. Butchers, tanners, farmers, farriers, shepherds, and all workmen who handle the wool and skins of animals whose death has been caused by the action of a *putrifying* or *septic virus*, are in danger of the *malignant pustule*, if they are not careful to wash immediately, and with particular care, all the parts which may have touched these corrupted matters. Water mixed with vinegar, or common ley, and above all, water in which lime has been mixed, are the liquids to be employed for this purpose.

This disease shows itself principally in warm and humid weather, amongst animals who inhabit low marshy places, and which feed upon pasturage that has been rapidly dried by the sun after having been wet, or upon fodder which has laid for some time in mud and slime, and is

charged with putrid insects. These animals then experience a gangrenous fever, or some other acute disease; their skin becomes covered with carbuncles; their blood and flesh are as if rotten, and cannot, in general, touch man without infecting him, by communicating to him the carbuncle. It must be noted, however, that in certain circumstances, the malignant pustule is not contagious.

Symptoms of the Malignant Pustule.

86. Two varieties of malignant pustules are distinguished, the prominent and the depressed.

*Prominent variety.—First period.** Uncomfortable but slight itching upon a very circumscribed point, without either redness, heat, or tension of the skin; acute but transitory prickings: little by little the epidermis or scarf skin separates and forms a serous pustule of the size of a grain of millet, but which soon grows and becomes brownish; the itching returns from time to time, the patient scratches and tears the pustule; one or two drops of reddish serosity escapes, and the itching ceases for several hours.

Second period. A small, moveable, hard, circumscribed, flat tumour is formed, having usually

* The description of this variety having been given with the greatest precision by Professor Chaussier and M. Enaux, we have thought we could not do better than take it from them.

the form and size of a lentil. The colour of the skin is not yet altered; only, in the centre, and under the first pustule, it is most commonly lemon-coloured, livid, and as if gangrenous; the itchings become very acute and more frequent, and are accompanied with a sensation of heat, erosion and burning: the skin now swells, and its surface becomes tense and shining; the *rete mucosum* thickens, and forms around the central point a sort of circle more or less large and elevated, sometimes pale, sometimes reddish or livid, sometimes orange or shaded with different colours, but always superficial, and covered with little detached pustules which soon unite, and fill with a reddish serosity. The central pimple, which formed the primitive tumour, changes colour, becomes brownish, very hard and insensible: it is a gangrenous point which suddenly acquires new growth. This period, which usually lasts a few hours, is sometimes slower in its progress, and lasts several days.

Third period. The disease is not confined to the skin, it penetrates little by little into the cellular tissue: the progress is now rapid, the centre of the tumour becomes harder, deeper, and entirely black; the gangrene extends by degrees, and the circle of pustules which always surrounds it announces and precedes the progress of the mortification. This circle gradually advances and enlarges; sometimes it is elevated and forms a

kind of collar round the core, which gives it a sunken appearance, and which forms a second compact tumour, yet not so hard as the centre, and still preserving no small degree of sensibility. At the same time a considerable swelling comes on, which often extends to a great distance: it is a kind of elastic tumefaction, occasioning a sensation of constriction and numbness in the part; the gangrene also increases in the cellular tissue. In a strong robust person, who has been early subjected to a methodical treatment, this third period lasts four or five days: then the disease stops, the swelling loses by degrees that state of tension and emphysema or air swelling which characterised the irritation; the circle of pustules assumes a more lively colour, the characters of healthy inflammation are observable, the patient feels a gentle heat and reiterated pulsation in the part; the gangrene becomes circumscribed: a red circle surrounds the tumour; an abundant suppuration is established which clears the cellular tissue, detaches the slough, and thus terminates the disease. But with feeble constitutions, the disease makes rapid progress, and the infection becomes general.

Fourth period. When the disease has attacked successively the *rete mucosum*, the skin and cellular tissue, the pulse becomes small and is more or less frequent and unequal; the skin is dry, the tongue arid and brownish; the heat appears more

moderate, yet the patient feels an internal burning which devours him; he often asks for drink, but nothing quenches his thirst; he is always in a depressed state; experiences swoonings, sickness, and sometimes acute pain of the stomach: in certain cases the respiration is short and interrupted by sobs and sighs; the urine is in small quantity, thick, and of a brick colour; sometimes though rarely diarrhœa, exhausting perspirations, and hemorrhages, succeed. When the disease arrives at its termination, the patient loses his reason and falls into a low delirium; all the local symptoms augment in intensity, the swelling becomes enormous, and he perishes in a gangrenous state, exhaling the most fetid odour. (Enaux and Chaussier, p. 184—192.)

Depressed variety. It begins by an intense itching which lasts several days; the second day a black point is perceived like that of a flea-bite. The third day some circumscribed and regular pustules make their appearance, accompanied with pain, heat, and a sensation of numbness in that part of the belly situated below the eruption; the patient experiences faintings and inclination to vomit; the pulse is concentrated. The pustules break; a reddish serosity escapes; a portion of skin underneath is observed to be black as if burnt, and adhering but little to the adjoining parts; there is little swelling, yet it occurs sometimes. The fifth day the anguish and

swoonings are very frequent. The sixth day delirium comes on; the local swelling and gangrene are strongly marked, and death ensues. This variety has been described by M. Davy le Chevrie: it is more dangerous than the preceding.

Treatment of the Malignant Pustule.

88. In the treatment of the malignant pustule, the object is to circumscribe in the smallest possible space, the little tumour or gangrenous spot, which has the greatest tendency to extend to the neighbouring parts; for this purpose, scarifications and especially caustics are to be employed. Internal remedies are not always necessary.

Scarifications or little incisions made with a lancet or bistoury are not sufficient to cure the disease, but are useful because they favour the action of other remedies. They ought not to be either too superficial or too deep; they should extend through all the mortified part, but not penetrate beyond the dead flesh.

Caustics. The butter of antimony, oil of vitriol, lunar caustic, and the hot iron, are amongst those caustics which should be employed in preference. But as their employment, as well as that of scarifications, should be modified according to circumstances, we will distinguish the different cases that may occur.

First case. If the disease be still in its first

period, (see p. 105,) the pustule should be cut, and the serosity which flows, wiped off; a morsel of lint of the size of a pea is then firmly rolled between the fingers and wetted with the butter of antimony, or oil of vitriol, &c.: this is placed upon the centre of the pustule, and secured by being surrounded with dry lint, and covered with an adhesive plaster and a suitable bandage.

This application is to be removed at the end of five or six hours, and a dry hard eschar or slough is found, upon which a pledget of lint is to be placed covered with a digestive plaster, of which we will give the composition § 89. The next day the dressing is to be renewed with the same digestive, if there be neither hardness, a circle of pustules, nor acute pain; for it is then evident that the caustic has arrested the progress of the disease. This dressing is repeated daily until the slough falls off; when removed, the wound is to be dressed with dry lint dipped in a weak solution of alum or of lime water, &c.

Second case. Recourse must be had to *scarifications,* if, after the application of the caustic, a hard tumour and circle of pustules form around the slough, and if the swelling be considerable: the slough is to be opened with the point of a bistoury, divided into several portions, and the incisions extended a little way beyond into the dead flesh, taking care not to cut the living; some portions of the eschar are removed with a pair of

scissors; the stagnant fluids at the bottom are to be absorbed with lint; lastly, a little roll of linen dipped in a liquid caustic (see § 75) is carried into the bottom and all the circumference of the wound; some little plugs of lint dipped in the same caustic are applied, and the whole covered with dry lint, compressed and bandaged. This application is removed at the end of a few hours, and the wound dressed with the animated digestive (see § 89); the following days the wound is washed with a mixture of a weak solution of common salt and brandy, or with the collyrium of *Lanfranc* (see § 90); it is afterwards dressed with the animated digestive, and compresses dipped in a decoction (see § 91) are to be applied. The dressings are renewed every twelve hours, until a line of separation is perceived between the dead and the living parts: lastly, the internal remedies hereafter described (§ 88) are to be employed, if necessary.

Third case. If aid is not obtained until towards the end of the third period, when the slough which forms the centre of the tumour is hard like leather, and the swelling very considerable, we should divide the whole of the infected part, increase the number of incisions if judged expedient, detach and remove the fragments of slough which might obstruct the action of the caustic, and apply the caustic as just directed. The first dressing consists in placing

upon the slough a pledget dipped in the stimulant digestive, in applying upon this a cloth spread with the camphorated liniment described § 92, and in covering the limb with compresses impregnated with the antiputrescent decoction of § 93. The dressings should be renewed every twelve hours until the slough separates. The wound then becomes simple, and should be dressed with dry lint or with lint dipped in a healing water.

Fourth case. If the malignant pustule be arrived at its fourth period, if the slough be dry and compact, and if every thing announce that the neighbouring parts are affected with a humid gangrene, we should commence by making scarifications, but with caution, for fear of giving rise to an abundant hemorrhage, which would exhaust the patient; caustic is afterwards to be applied, and in preference the hydrochloric acid or concentrated spirit of sea salt, which is employed like the butter of antimony (§ 75) or the lunar caustic. This is applied upon every part of the surface of the wound, pressing principally upon those which have been scarified, and upon the most afflicted parts. A cataplasm is then applied, composed of the powder of bark and camphorated spirits; this is covered with a fine rag spread with the camphorated liniment of § 92, and with compresses dipped in the antiputrescent decoction §93. This cataplasm should be renewed every six hours, until the appearance of the inflammation which an-

nounces the separation of the slough: from this time the dressing should consist of a pledget of lint spread with the stimulant digestive, § 89, or dipped in the collyrium of Lanfranc. If the slough be soft and putrid, it would be better to suppress the camphorated spirits, to continue the application of bark, and to wash with the antiputrescent decoction: the internal treatment hereafter described should also be employed.

If the gangrene should make fresh advances, we should recommence scarifications and cauterisations of the dying flesh with the spirit of salt (hydro-chloric acid), but depend principally upon the employment of internal remedies. If the slough separate, the wound is dressed with lint as if it were a simple ulcer.

Internal Treatment.

88. Diet: vinegar and water, or lemonade, are generally sufficient during the first and second periods of the disease. In the third period, if the pulse be small, hard, tremulous, and accompanied with subsultus tendinum; if the swelling is hard and circumscribed, an opiate is to be given, composed of bark and camphor (see § 94). On the contrary, if the pulse is feeble, the swelling extensive, supple, flabby, and serous, and the slough humid and imperfectly circumscribed, the acidulated decoction of bark (§ 95) should be administered. The patient must observe the most severe

regimen; he should only take rice, barley water, or boiled bread and water; old wine or new beer mixed with an equal quantity of water, and lemonade, are also useful.

Two grains of tartar emetic dissolved in a glass of water, should be administered, if the patient feels an inclination to vomit, if the tongue is white, and covered with a thick slime, yet soft and humid, and if the urine gives a yellowish deposit; the emetic must be carefully avoided if the tongue be dry, arid, and red, or covered with a black and scaly crust, and if the urine be crude. The retchings which the patient experiences in this case, depend upon irritation, and recourse should immediately be had to the antiputrescent and acidulated decoction of § 95.

Preparation of the Remedies to be employed in the cure of the Malignant Pustule.

89. *Stimulant digestive.*

White honey, or better, honey of roses	1 ounce
Verdigris finely powdered - -	2 drachms
Powdered myrrh - - -	1 drachm
The yellow of an egg.	

These substances carefully mixed in a copper mortar, form an ointment which hardens the slough and revives the flesh. Its activity may be increased by augmenting the dose of verdigris; two drachms of the spirit of turpentine are added

when the slough is spongy, and tending towards a putrid dissolution.

90. *Collyrium of Lanfranc.*

White wine - - -	18 ounces
Prepared orpiment -	2 drachms
Verdigris - - -	4 drachms
Myrrh - - - -	48 grains
Aloes - - - -	48 grains.

These substances are reduced to powder in a mortar, and the wine added little by little. We have noticed the cases in which this collyrium is applicable.

91. *Resolutive decoction.*—Boil in a pint of water a few pinches of one or other of the following substances: elder, St. John's wort, or chamomile flowers, the summits of milfoil, the stalks of scordium or mint; add a quarter of a pint of camphorated spirits, two ounces of common salt, or of vitriolated tartar (sulphate of potash): we should avoid the use of sal ammoniac and of tartar.

92. *Camphorated liniment.*

Camphor - - -	1 ounce
The yellow of two eggs.	

These two substances are to be rubbed together in a mortar, and two ounces of white honey are to be added, and carefully mixed.

93. *Antiputrescent decoction.*

Pounded bark - - -	1 ounce
Camphorated spirits -	4 ounces
Common salt - - -	½ an ounce.

Boil the bark in half a pint of water, and add the other two substances.

94. *Opiate.*

Finely powdered bark -	1 ounce
Camphor - - -	1 drachm
Syrup of lemons	
Yellow of an egg.	

The camphor is to be rubbed up with the yellow of the egg, the bark added by degrees, and a sufficient quantity of lemon syrup to make an opiate, which is to be divided into eight equal parts, and one given every three hours.

95. *Acidulated decoction of cinchona or bark.* —An ounce of bruised bark is boiled in a pint and a half of water, until reduced to a pint, and strained: two ounces of lemon syrup and a few drops of sulphuric acid (oil of vitriol) are then added: the acid is added drop by drop, until the liquor has acquired an agreeable acidity. A glass of this drink is to be given every three hours, and even oftener, if the symptoms of putridity are considerable.

BITES OF RABID OR MAD ANIMALS.

96. It is perfectly proved that men, horses, mules, asses, oxen, hogs, and still oftener foxes, wolves, cats, and dogs, become mad without having been bitten. Several circumstances may occasion this dreadful disease; but, in general, it is principally observed in very hot summers and in rigorous winters. Madness is almost always communi-

cated by the bite of an animal affected with it; yet it may be occasioned by the application of the saliva of a mad animal upon the lips or upon wounds.

Signs of Madness in Dogs.

According to Messrs. Enaux and Chaussier, a dog at the commencement of madness is sick, languishing, and more dull than usual; he seeks obscurity, remains in a corner, does not bark, but growls continually at strangers, and without any apparent cause; refuses to eat or drink; his gait is unsteady, nearly resembling that of a man almost asleep. At the end of three or four days he abandons his dwelling, roving continually in every direction; he walks or runs like a drunken man, and often falls. His hair is bristled up, his eyes haggard, fixed, and sparkling; his head hangs down, the mouth is open and full of a frothy slaver, the tongue is out, the tail between the legs; he has a horror of water; this liquid seems even to redouble his sufferings; he experiences from time to time transports of fury, and endeavours to bite every object which presents itself, not even excepting his master. Light and lively colours increase his rage. At the end of thirty or thirty-six hours he dies in convulsions.

It is evident that measures should be taken to kill, or at least to tie and shut up the animal, the moment that symptoms of madness appear.

The dead body putrifies with the greatest rapidity, and exhales an infectious odour; it is important not to leave it exposed to the air, lest other animals should devour it, and become subject to the disease. It ought to be buried very deeply; and the walls and every part of the place where he has been confined, as well as the instruments employed in giving him food, should be washed with water in which quicklime has been suspended. The person who may have touched the dead body, must carefully wash his hands with vinegar.

Treatment of Madness.

97. A person bitten by a mad animal rarely experiences the symptoms of madness before the thirtieth or fortieth day. It is necessary, however, to administer relief immediately after the accident.

1st. The patient should be undressed, and his clothes put into water, in order to prevent contagion, in case they should have touched the saliva. 2d. If the wound be recent, it should be left to bleed, and pressed in every direction in order to facilitate the flow of blood: it is then to be washed with water, or better, with water holding some salt or soap in solution. If the bite be small and deep, it should be enlarged with a bistoury and pressed: this operation will be neces-

sary, if the scarf-skin or epidermis only has been removed. It must be recollected that the wounds often appear superficial, although the venom may have penetrated deeply. 3d. The wound is to be washed with a rather rough cloth or sponge, in order to irritate and occasion it to bleed; it would even be useful for this purpose, to apply a cupping glass. 4th. The wounds, and even the excoriations, must be cauterised with one or other of the caustics mentioned § 75: but the hot iron at a white heat, the butter of antimony, or the oil of vitriol, are to be preferred. The cauterisation must be perfect and deep; if it be too slight, it will not prevent madness; and we have nothing to fear from cauterising too much. If the wounds be numerous, they must be cauterised successively a few at a time, at intervals of a day; and commencing with those of the head and face. 5th. Six or seven hours after having cauterised, a large blister, prepared as indicated § 100, should be applied upon the slough, left twelve hours, removed, the skin cut with a pair of scissors, and dressed twice a day, with beet or cabbage leaves, spread with butter or simple cerate (see § 101). 7th. When the slough has fallen, which takes place between the fifth and the eighth day, the wound should be healed, if we perceive that the cauterisation has extended deeper than the tooth of the animal: if not, we should cauterise again, and when

the second slough has fallen, keep up the suppuration for forty or fifty days: for this purpose a pea, a bean, or what is preferable, a piece of the root of iris, of birth-wort, or of gentian, should be put into the wound, which is then dressed with the blistering pomatum of §100.*

Precautions to be taken.

98. If the wound be on the head, all the hair should be shaved off so as to be able to see and cauterise every part that may be bitten. If swelling and inflammation of the head succeed the cauterisation, emollient and resolutive fomentations should be employed, and the wound dressed as if it were simple.

The bites of the lips, cheeks, and eyelids, should be burnt deeply, and the suppuration kept up for a long time. The cauterisation of the eyelids requires much care: they should be raised up so as not to touch the eye, and the edges of the bite burnt by means of a little pencil dipped in a caustic. If the saliva of the rabid animal has touched the globe of the eye, the pencil dipped in caustic must be passed over it lightly; there will be no other inconvenience than that of giving rise to a slight inflammation, and a more or less considerable flow of tears: in this case the eye should be washed with a decoction of linseed, or of mallows root, or with a solution of

gum arabic, to which a few drops of liquid laudanum has been added. If there be a wound in the mouth, it should be washed with vinegar and water, and the bite afterwards cauterised with the hot iron: the liquid caustics would have the inconvenience of mixing with the saliva, and of extending their action upon more or less important sound parts.

When the bite is near an artery, and, in this case, more or less considerable pulsation is seen, or felt by applying the extremity of the finger upon the wound, the surface should only be lightly touched with a pencil dipped in the butter of antimony: by this means we avoid opening the artery, and consequently do not dread a hemorrhage, which, without this precaution, would take place at the separation of the slough. There would be danger in cauterising the bite as has been directed, if the artery, instead of being covered by flesh, or by the cellular tissue, were naked; in this case we should content ourselves with applying upon the wound a small quantity of the powder of cantharides, or of some acrid ointment.

If the bite be old, the wound cicatrised, and if it be certain that the animal was mad, the *wound must be opened without delay by means of a bistoury, burnt, and a suppuration afterwards kept up for some time.* (Enaux and Chaussier.)

Use of Chlorine.

M. Brugnatelli has reported several facts which tend to prove that chlorine (oxygenated muriatic acid) applied to the wounds made by rabid animals, prevents madness; and long before, Cluzel had announced that the same remedy, taken internally, had saved several persons bitten by a mad wolf. Until experience pronounces upon the advantages of this remedy, it is of the highest importance to continue to burn the wounds, as we have just recommended.

Internal Treatment of Persons bitten by Rabid Animals.

99. During the first days, perspiration is kept up by means of the drink prescribed §76, in speaking of the viper; it is only when the wound is very much inflamed and painful, that this drink is replaced by a decoction of mallows or of linseed, or by Dover's powder, §101.* If the pulse he hard, blood should be drawn. Tartar emetic and purgatives are to be administered if the stomach be loaded, the tongue covered with a yellow coat, and the mouth clammy. Mild food of easy digestion, and moderate exercise, are prescribed. If the patient has fever, the regimen is more severe.

Advantages of the Water-plantain.

It is asserted that several persons affected with madness have been cured by the use of the root of the *water-plantain* (*alisma plantago*) washed, dried in the shade, and mixed with bread and butter. Two cows attacked by this disease were treated with this plant; one perished, the other, which had eaten a much greater quantity of plantain, was entirely restored. These facts, however surprising they appear, may be correctly stated: experience only can decide; in the mean time, we think it our duty to recommend to give to persons affected with madness, immediately after having cauterised them, (see § 98,) two doses, at an interval of two hours, of 20 to 24 grains of the root of this plant: this dose of the remedy is without danger, and perhaps it might be of some utility.

Formula of the Remedies to be employed in the Treatment of Madness.

100. *Blistering Plaster.*

Melt on a slow fire:

Yellow wax - -	4 ounces
Turpentine - -	6 drachms
Olive oil - - -	1 ounce 2 drachms.

The mass is to be taken off the fire, and when it begins to cool, add of

Cantharides well powdered -	3 ounces
Mastich - - - -	2 drachms.

This plaster may be replaced by the following: 1. Mix 3 drachms of cantharides with an ounce of *diachylon* plaster. 2. Mix 6 drachms of finely powdered cantharides with crumbs of bread and very strong vinegar into a thick paste: spread it upon a small piece of linen.

100.* *Blistering Pomatum.*

Mix:

Finely-powdered cantharides - -	½ drachm
Cerate, basilicon, or some other ointment	1 ounce.

101. *Simple Cerate.*

Melt over a slow fire:

White wax - -	1 ounce
Olive oil - - -	2 ounces
Spermaceti - -	2 ounces.

101.* *Dover's Powder.*

Reduce into a fine powder:

Ipecacuanha - -	½ drachm
Extract of opium -	½ drachm
Sulphate of potash -	1½ drachm.

Mix intimately.

From 12 to 24 grains, are to be given every evening in honey.

Treatment of Cattle.

Oxen, calves, sheep, and horses, bitten by a mad animal, experience nearly the same symptoms as man, but with much greater rapidity.

If the bite has been inflicted on the tail or ear, these parts must be cut off, and the bleeding wound cauterised with the hot iron; it should afterwards be dressed with the digestive turpentine ointment.

If the bites have taken place upon a part which cannot be removed, the hair should be cut off, the wounds washed, enlarged with a bistoury, deeply cauterised, and dressed with the same digestive turpentine ointment. They should from time to time be irritated with the powder of cantharides or with caustic potash, and not allowed to close for several weeks. The animal should be separated from the others, and the persons who dress him should wash their hands with soap or vinegar and water. Care should also be taken not to skin the animal, if he should die of the disease.

Digestive Turpentine Ointment.

Mix:

Turpentine - - -	2 ounces
Olive oil - - -	2 ounces
The yellow of two eggs;	

and when it is desirable to increase the suppuration, half a drachm of powdered caustic potash is to be added.

ASPHYXIA, OR APPARENT DEATH.

We think it advisable to treat of the following cases of apparent death.

1. From the vapour of charcoal.
2. From the vapour of lime-kilns, vintage-tubs, of wines, or other liquors in fermentation, from morasses and coal pits.
3. From privies, drains, and common sewers.
4. From want of respirable air.
5. From submersion, or *drowning*.
6. From strangulation, or *hanging*.
7. From cold.
8. From heat.
9. The asphyxia or inanimate state of new-born infants.

Of Aphyxia from the Vapour of Charcoal.

102. *Signs.* Persons suffering from the vapour of charcoal, experience a great heaviness of the head, distressing tinklings in the ears, a great disposition to sleep, diminution and inevitable loss of strength. To these symptoms are joined a troubled vision, excruciating pains of the head, great difficulty of respiration, violent palpitations of the heart, which are soon followed by suspension of the respiration and circula-

tion; the senses no longer perform their functions, sensibility appears extinguished, and depression is so extreme, that the individual is motionless and appears dead; the limbs are sometimes flexible, sometimes stiff and distorted; the heat of the body is natural, the face is sometimes red or violet, at others pale and very leaden; in certain circumstances the excrements are passed involuntarily. It sometimes happens that only some of the symptoms we have enumerated are observed.

Treatment of Asphyxia from the Vapour of Charcoal.

103.—1. In the first place, the person should be exposed to the open air, without fearing the cold, which can never be hurtful: he should be undressed and laid upon the back, with the head and chest rather more elevated than the rest of the body, in order to facilitate respiration.

2. Carefully avoid placing the patient in a warm bed, and administering fumigations of tobacco.

3. Vinegar diluted with three parts of water, or lemon juice diluted with water, should be administered, and at the same time cold vinegar and water should be thrown upon the whole of the body, and particularly upon the face and

chest; the body should be rubbed with cloths dipped in the same liquor, in camphorated spirits, Cologne water, or in any other spirituous liquid. In three or four minutes the wetted parts are to be wiped with warm towels, and two or three minutes after the aspersions and frictions with cold vinegar and water are to be repeated. These means should be perseveringly employed.

4. The soles of the feet, the palms of the hands, and the whole course of the back bone should be irritated with a strong hair brush.

5. An injection of cold water mixed with a third of vinegar, should be administered: a few minutes after, another is to be given consisting of cold water, two or three ounces of common, and an ounce of Epsom salt.

6. Well sulphured matches should be lighted and carried backwards and forwards under the nose, to irritate the interior of that organ, or else volatile alkali,* or Hungary water should be held to it: the nose might also be irritated by introducing gently into the nostrils a little roll of paper or a feather.

7. Air should be blown into the lungs by means of a process described § 104.

8. If, notwithstanding the employment of these means, the patient continue to be plunged in a

* Great care should be taken not to leave the bottle containing concentrated volatile alkali a long while under the nose. (See §11.)

state of great lethargy, if the natural heat be preserved, if the face be red, the lips swelled, and the eyes prominent, he should be bled in the foot, or better still, in the jugular vein. This is preferable to the emetic which has sometimes been employed in similar circumstances, and which is rather hurtful than useful.

9. When the patient is entirely recalled to life, he should be placed in a warm bed, in an airy room, with the windows open, and care should be taken to exclude all *useless* persons. He should now take a few spoonfuls of generous wine, such as Malaga, Alicant, Rota, Madeira, or Sherry; or else some warm sugared wine, or a few spoonfuls of the antispasmodic potion, § 7.

10. Tartar emetic can only be administered when the patient, after having recovered his senses, is troubled with retchings, a weight at the stomach, &c. and even in this case it is infinitely better to have recourse to purgatives and irritating clysters, prepared with common salt, and the sulphate of magnesia, (Epsom salt).

11. The treatment we now direct must be administered with the greatest promptitude, and continued for a long time, even though the patient should appear dead. Five or six hours have sometimes elapsed before the patient has been roused from the state of *apparent* death in which he has been plunged. Blowing air into the lungs must be particularly insisted upon.

Process for introducing Air into the Lungs.

104. The necessity to which physicians have often been subject, of introducing air into the lungs to resuscitate asphyxied persons, has induced them to invent several methods of effecting this object: we will endeavour to describe them, commencing with those which merit the preference.

1. After having depressed the root of the tongue with the index finger of the left hand, the smaller extremity of the laryngien tube, invented by professor Chaussier,* is introduced into the larynx; taking care to press gently in order to place the piece of buffalo skin or agaric upon the opening of the larynx; the operator takes the other extremity in his mouth, and by inspiring himself, removes the mucus which may be contained in the bronchial vessels; a little

* The laryngien tube is conical, from seven to eight inches long, and resembles considerably a surgeon's sound; it is made of silver or copper: the larger extremity is sufficiently capacious to receive the nozzle of a pair of bellows, the orifice of a bladder, or to be put into the mouth; the lesser extremity, or that which should enter the larynx, is flattened and pierced with two oblong holes. At the distance of about fifteen lines from the extremity, the instrument presents a rounded curve, a ring or collar here surrounds it which is pierced with several holes, to which a plate of agaric or a morsel of buffalo skin may be fastened: by this means the opening of the larynx is completely shut, and the air thrown in must necessarily dilate the chest.

pair of bellows is then adapted to this extremity, or a bladder filled with air, or even the mouth, and the air is forced in little by little, so as to imitate the natural respiration; at the same time friction should be applied upon the belly and chest, with a piece of woollen stuff.

2. In the absence of this instrument, air may be blown into the lungs by introducing the nozzle of a pair of bellows into one of the nostrils, and blowing whilst the other nostril is kept shut. It would be still better if a surgeon's sound could be had, to pass one of its extremities into the larynx, introducing it by one of the nostrils, and adapting the bellows to the other.

3. If it is impossible to introduce air by the process which we have just described, the operator should apply his mouth upon that of the patient and blow.

4. We should avoid making, as has been recommended, incisions into the wind-pipe, for experience proves that the air introduced by this means issues by the opening of the larynx, without having dilated the lungs.

Of Asphyxia from the Vapour of Lime-kilns, Vintage-tubs, Wine-tubs, or from other Liquors in fermentation, and from Morasses and Coal-pits.

105. The signs of these species of asphyxia, and the means to be put in practice for curing them, are the same as those of which we have spoken in treating of the effects of the vapour of charcoal. See § 102 and 103.

Of Asphyxia from Privies, Drains, and Common Sewers.

106. The asphyxia, which makes the subject of this article, is principally *owing* to *hydro-sulphuric acid gas* (sulphuretted hydrogen): this gas, even when mixed with a large quantity of air, is a very energetic poison.

Signs. When the disease is slight, the patient experiences uneasiness, inclination to vomit, convulsive movements of every part of the body, and principally of the muscles of the chest and jaws; the skin is cold, the respiration free but irregular, the pulse very much embarrassed.

107. When the disease is more serious, the patient is deprived of sensation, consciousness, and motion; the body is cold, the lips and face violet; a bloody froth escapes from the mouth,

the eyes are shut and without brilliancy, the pupil dilated and motionless, the pulse small and frequent, the palpitation of the heart irregular and tumultuous; the respiration is short, difficult, and convulsive; the limbs are relaxed. To this state sometimes succeeds a more or less violent agitation.

When the disease is still more dangerous, the muscles are affected with violent contractions of short duration, which are succeeded by convulsive movements, with a curvature of the body backwards. The patient appears to experience acute pains, and utters sounds like the bellowing of a bull; the skin, the respiration, the palpitations of the heart, the face, the lips, the mouth, and the pupil of the eye, are as has been described § 107.

Treatment.

1. Exposure of the patient to the open air, aspersions with cold vinegar and water, friction with a strong hair brush; these form the first assistance to be given to persons affected by privies. In speaking of asphyxia from the vapour of charcoal, we have detailed the manner in which these aids should be administered. See § 103.

2. If some chlorine (oxigenated muriatic acid gas) can be procured,* the bottle containing it

* Chlorine may be readily formed for this purpose by mixing together strong nitric and muriatic acids. T.

should be passed backwards and forwards under the nose; but it should not be left beneath it a long time, for fear of irritating the lungs. This remedy appears particularly useful when recourse can be had to it promptly.

3. If, as often happens, the patient has swallowed some of the water contained in the privy, vomiting should be immediately excited by giving a glass of oil, or, better still, two grains of tartar emetic or 24 grains of ipecacuanha, as is directed § 61.

4. If these means should prove insufficient, and the palpitations of the heart be irregular or tumultuous, blood should be drawn from the arm, and in quantity proportioned to the strength of the individual. This operation may be repeated some time after, without hesitation, if the first has produced a good effect.

5. We should endeavour to calm the nervous disorders, the spasms and convulsions, by cold baths, and by the use of a few spoonfuls of the antispasmodic potion described § 6. After taking a bath, the patient should be placed in a warm bed, and frictions continued upon the spine.

6. Lastly, stimulants and blisters should be applied to the feet, if, notwithstanding the employment of these remedies, the individual still remains deprived of sensation, consciousness, and motion.

Of Asphyxia from deficiency of respirable Air.

108. When a number of persons remain for a long time in an apartment, a theatre, or any other place where the air is not changed, symptoms of asphyxia appear, not only because all the parts of the air capable of supporting respiration have been consumed, but also because, during the respiration, some carbonic acid gas has been formed, which remains in the place, and acts as an energetic poison.

Signs. The patient experiences an abundant and continual sweat, accompanied with insupportable thirst, and followed by acute pains in the chest, difficulty of breathing, suffocation, and an intense fever; he loses strength, falls into a state of deep lethargy, which, if assistance be not procured immediately, soon terminates in death.

Treatment.

The treatment of this disorder does not differ in any respect from that which has been described § 103, in speaking of asphyxia from the vapour of charcoal.

Of Asphyxia from Submersion, or by Drowning.

109. As it is very uncertain what length of time a person can remain under water without perishing, it is of the utmost importance to administer with the *least possible delay* the aid about to be described, even though his state should appear desperate. It would be dangerous to lose a moment: and M. Portal recommends the commencement of regular treatment even in the boat into which the drowned person has been received, upon the bank, or in a neighbouring commodious place. The patient should be conveyed in a hand-barrow, or some sort of carriage, upon straw or a mattrass; he should be laid upon his side, the head uncovered and a little raised. If there should be no means of conveying him in this way, two persons may take him upon their arms, or support him sitting upon their joined hands.

Treatment.

1. Care should be taken not to suspend the drowned person by the feet; this practice, formerly employed with the intention of getting rid of the water which may be in the stomach and chest, is useless and dangerous. Violent agitation, in order to recall life, should also be avoided: this practice has often proved fatal.

2. Whilst a person cuts off the wet clothes of a drowned person, he should be placed upon his right side, in a low bed, with the head rather more raised than the feet, and in a chamber where there is a fire: the patient's head should be supported by the hand placed under the forehead, and gently inclined, and the water contained in the mouth and nose evacuated by opening the jaws.

3. Every part of the body should be examined, to discover whether some mortal wound may have been received; in this case, all assistance would be useless; but we should not abandon him unless the existence of such a wound be perfectly ascertained.

4. Some well sulphured matches should be lighted and passed backwards and forwards under the nose to irritate the internal part of that organ, or he should be made to smell of volatile alkali or Hungary water, see page 129. Whilst these remedies are administering, another person should endeavour to restore warmth to the patient. *The body should be warmed very gradually:* a bladder filled with warm water should be placed upon the belly; warm bricks applied to the feet; a bag filled with hot ashes, a heated iron, or a warming pan should be passed backwards and forwards upon the surface of the body; general frictions should also be made with a dry brush, with hot flannel, or even with the

hand; and afterwards with flannel dipped in camphorated spirit, vinegar, &c.

5. The interior of the lips and nose should be tickled with a feather or some other light substance.

6. Air is to be blown into the lungs by the processes described § 104.

7. A clyster is to be given, consisting of water in which four ounces of common salt have been dissolved, or with three parts of water and one of vinegar.

8. *We must carefully avoid giving tobacco injections, or introducing the smoke of this plant into the fundament,* as several authors have prescribed; these remedies are useless, offer no advantage over those which we propose, and may augment the danger.

9. If the patient do not recover, small pieces of agaric or German tinder, of cork or of paper, should be burned upon the pit of the stomach, the thighs and the arms.

10. If his state improves, and it be possible to make him drink, a table-spoonful of camphorated spirit, or of Cologne water diluted with two parts of water, should be given him every five minutes. *But he must not be forced to drink as long as there is much difficulty in swallowing.*

11. If, instead of recovering, the patient remain insensible, with the face red, violet or black, and the limbs flexible and warm, some blood should

be drawn from the foot, or still better, from the jugular vein; but if the body be cold and the limbs stiff, we should carefully avoid having recourse to this remedy.

12. If the drinks which have been given occasion sickness, with retchings, if the tongue be furred and the mouth clammy, two or three grains of tartar emetic (§ 61) should be given, particularly if the accident has occurred a short time after having eaten. On the contrary, some spoonfuls of warm wine are to be given if the medicines have operated by stool.

13. The drowned person must not be abandoned until there is a certainty of his being dead. We shall explain further on, by what means *real* may be distinguished from *apparent death* (see §116). It should be remembered that *eight* or *ten hours* are very often scarcely sufficient to re-establish the healthy action of the vital functions.

Of Asphyxia from Strangulation, or by Hanging.

110. The same means should be employed for re-establishing the health of persons who have been hanged, that we have just directed in speaking of the drowned. It must, however, be observed:

1. That it is not necessary to warm the body, unless it has been exposed a long while to the open air, and in a cold place.

2. That the cord must be cut and the knot untied.

3. That drawing blood from the foot, and especially from the jugular vein, is much more frequently necessary than for the drowned.

Of Asphyxia from Heat.

111. It sometimes happens that persons are made ill from having been for a long time in a hot place.

In this case, it is necessary:

1. To remove the patient into the fresh air.

2. To undress him, unless it be very cold, for then it will be sufficient to loosen the clothes; and to cut all the bands which might obstruct the free circulation of the blood.

3. To administer a mixture of equal parts of water and vinegar, or of lemonade.

4. To give an injection of salt water. See page 129.

5. To apply six, eight, or ten leeches to the temple, if the state becomes worse or does not improve.

6. To draw blood from the foot, or, in preference, from the jugular vein, if the respiration and beating of the heart are suspended.

7. To follow the directions which have been given in speaking of asphyxia from the vapour of charcoal.

Asphyxia from Cold.

112. When a person has been exposed for a long time to the action of cold, he experiences a general numbness; a sort of intoxication; soon falls asleep, loses all consciousness, and appears dead. It sometimes happens that he comes to himself again without any kind of assistance; but most frequently he perishes. In such cases it is important,

1. If the patient be distant from a place where he can be taken care of, to convey him there immediately, wrapping the body in a blanket, and leaving the head uncovered.

2. To take off his clothes and plunge him into *snow;* to rub him gently with it, directing the frictions from the body towards the extremities; to employ, a few minutes after, frictions with cloths dipped in ice-water, or water at the temperature of melting ice, afterwards with water from which the chill has just been taken off, lastly with warm water; and care should be taken *to warm the body not suddenly by placing it before a hot fire, but slowly and by degrees.*

3. If neither snow nor ice can be procured, the patient should be plunged into a bath of cold water, which is then gently heated by adding little by little, at first water from which the chill has just been taken off, afterwards water less

cold, lastly warm: he should be rubbed in the same way as directed in the preceding paragraph, and have water thrown upon the face.

4. The lips and insides of the nostrils should be tickled with a feather, or some other light substance.

5. Air should be blown into the lungs. See § 104.

6. He should be made to inhale volatile alkali, and the other stimulants of which we have spoken page 129.

7. When the body begins to warm, and when the limbs are no longer stiff, the patient should be put into a dry bed *not warmed*, and friction with a dry brush applied.

8. Irritating clysters are to be given, as directed page 129.

9. As soon as he can swallow, he should drink some vinegar and water, infusion of mint, broth, and wine and water.

10. The use of solid food should not be allowed until several hours after perfect recovery.

Frozen Limbs.

113. Persons whose limbs have been frozen, or nearly frozen, should be treated like those who have been affected by cold, except that it is necessary only to plunge into the bath the parts which have been injured; and the frictions should be made upon these parts. Some orange-

flower water, containing six or seven drops of volatile alkali to the cup, may be administered internally.

Assistance to be given to Children who are born in a state of apparent death.

114. Children who are born without giving any signs of life, may be in a state of asphyxia, or apoplectic: it is very important to distinguish between these two states, since the treatment which is proper for the one is injurious in the other.

Of the Asphyxia of new-born Children.

Causes. Asphyxia of infants may be owing to a protracted labour, with considerable hemorrhage; to the delicacy of the infant, and, as is most frequent, to the compression of the umbilical cord, or navel-string; it is accordingly observed to be much more frequent when the child is presented by the feet.

Signs. The child, which, according to the expression of Baudeloque, may be regarded as *having no blood at all,* is pale, colourless, or violet; its flesh is flabby, the limbs supple and motionless; it is impossible to feel the beating of the heart or of the navel-string, respiration ceases, and it appears dead.

Treatment.

However desperate the situation of a new-born child may be, the following assistance must be given it immediately. It should not be abandoned until the signs of putrefaction are very evident.

1. Carefully avoid cutting the navel-string, particularly if there be no hemorrhage, if the after-birth (*placenta*) has not yet begun to separate, and if the string offers some slight pulsations.

2. Place the child upon its side, taking care to raise the head and to expose the face to the air: the other parts of the body should be wrapped in flannel. Avoid dragging the navel-string.

3. Examine the mouth and nostrils to see if there be not some mucosity or clots of blood which prevent the air from entering the lungs: in this case, introduce the finger, a feather, or a morsel of lint dipped in salt water, into the mouth, and apply it gently, but constantly, in the same direction, in order to detach every thing which might obstruct the admission of air.

4. Proceed to the introduction of air, as directed § 104.

5. Frictions with a soft brush should be made upon the back, and upon the soles of the feet; the other parts of the body should be rubbed

with warm cloths dipped in wine; the navel-string, the chest, and belly, must be pressed very gently, and alternately.

6. Administer a small injection composed of warm water and a little vinegar, or a few grains of salt.

7. If by these means the infant does not revive, plunge it up to the arm-pits in a bath of warm water, to which a little wine has been added.

8. Pinching of the skin, sucking of the breasts, and the application of cupping-glasses, may also be employed, but with much care.

9. Avoid making use of too powerful stimulants, such as the volatile alkali, radical or concentrated vinegar, &c.

10. The use of these means should be persevered in for a long time, but with some intervals, and varying them in every possible way.

If the *after-birth* or *placenta* be detached, if the navel-string offer no longer any pulsations, it should be cut, the child removed from the mother, and the treatment just described should be adopted.

Of the Apoplexy of new-born Children.

115. The *causes* which may occasion apoplexy in new-born infants, are, a hard labour, compression of the head by the pelvis or forceps, and that of the neck by some turns of the navel-string about it.

Signs. The infant gives no signs of life, but is insensible and motionless: the face is black, livid and swelled; the skin discoloured; the chest filled with blood as if by extravasation. Sometimes a soft tumour is observable upon the head, of a variable size, filled with blood or serosity.

Treatment.

1. The navel-string should be cut immediately, to allow the blood to flow; and the bleeding should be encouraged by frictions with warm cloths, upon the chest and belly, and by holding up the head.

2. If by cutting the cord, the bleeding should not be copious, one or two leeches should be applied behind the ears. When no leeches can be procured, one of the veins of the head or neck should be opened with a lancet. If there be a tumour on the head, it should be opened with a bistoury, and when it has subsided, the flow of blood should be encouraged by the application of compresses dipped in warm water.

3. Plunge the infant into a bath of warm water mixed with some stimulating liquor, as wine, brandy, or vinegar. Whilst in the bath, the back should be rubbed with warm cloths.

4. The stimulants mentioned in speaking of the asphyxia of new-born children may also be employed. See pages 145, 146.

Of the Signs of real death, and of the means by which the living may be distinguished from the dead.

116. It is well known that persons who have been supposed dead, have returned to life at the time they were about to be opened or interred, and sometimes when they have been already in the coffin or even in the tomb; and it may be safely asserted, that many have died only from having been interred with too much precipitation. These fatal mistakes arise from the difficulty there is, under certain circumstances, in distinguishing real from apparent death; it becomes therefore highly important to examine with care the appearances which have been regarded as sufficient to establish the distinction.

1. We fancy that one of the most certain signs of death is, *the stiffness of the dead body;* but as it sometimes happens that this sign exists during life, it becomes necessary to point out the difference between the stiffness of death and that which occurs during life, in certain diseases.

A. Stiffness may be very considerable in a person who has been frozen, who is not yet dead, and who may even be recalled to life. This stiffness cannot be confounded with that which is the inevitable result of death, because it is known that the body has been exposed to the action of severe cold, and above all because it is

very general: in fact, the skin, the breasts, the belly, and all the organs, may possess the same rigidity as the muscles, a circumstance not observable in cadaverous stiffness, in which only the muscles present a great degree of resistance. Besides, when the skin of a frozen person is depressed by pressing forcibly upon it with the finger, a hollow is produced which is a long while in disappearing. When the position of a frozen limb is changed, a little noise is heard, caused by the rupture of small particles of ice contained in the displaced part.

B. The stiffness to which the late M. Nysten has given the name of *convulsive*, and which sometimes manifests itself in violent nervous diseases, may be easily distinguished from cadaverous stiffness. When a limb is stiff in consequence of tetanus, or spasms, convulsions, &c. the greatest difficulty is experienced in changing its direction, and when left, it immediately resumes its former position. It is not the same in stiffness from death; the limb, the direction of which has been changed, does not return to its former position.

C. The stiffness which occurs in certain *syncopes*, or *swoonings*, cannot be confounded with *cadaverous* stiffness; for, in the syncope, the *stiffness* takes place immediately after the commencement of the disease, and the trunk preserves a degree of warmth; whilst the *cadaverous* stiffness

is not observed until some time after death, and when the heat of the body is no longer evident to the senses.

D. The stiffness which is sometimes remarked in persons suffering under asphyxia, may be easily distinguished from *cadaverous* stiffness. Imagine a person in a state of asphyxia for ten or fifteen minutes, and whose limbs are stiff, it is impossible that this stiffness should be the result of death, since the dead bodies of persons in this state, who happen to die in the space of a few minutes, do not become stiff until the expiration of several hours.* If the body of a person suffocated by a non-respirable gas, or by strangulation, be cold, we may be certain that more than twelve hours have elapsed since the manifestation of the asphyxia (for in these diseases the heat of the body is preserved for at least twelve hours): there is then no doubt but that the stiffness is *cadaverous*, since it is impossible that persons in a state of asphyxia should live twelve hours.

2. If, from a cause which it is not always possible to foresee, the individual who has been thought dead for a long time, be cold and flexible, instead of offering a certain degree of stiffness, he should not be buried hastily. Before deciding that he is no more, one of the muscles of the arm or the thigh must be exposed, and electrified by

* The more sudden death has been, the longer is cadaverous stiffness in taking place.

means of the voltaic pile. If it give no sign of contraction, life is extinguished: in the contrary case, the individual is not dead, and we must endeavour to reanimate the movements of the heart and lungs by the methods directed in the article asphyxia. (See § 103).

3. The most certain sign of death, is *distinct putrefaction;* but is it prudent to wait until it is well developed before the interment? This practice is dangerous to attendants, and ought to be forbidden. It has been thought that a commencement of putrefaction was sufficient to prove that the individual was dead, and that the interment should take place immediately after this sign. We join in this opinion; but at the same time, *we must insist that it does not belong to the vulgar to decide whether there is or is not a commencement of putrefaction; a physician only can ascertain this fact.* How many times have we seen persons who were thought dead, exhaling a bad odour, exhibiting several violet spots upon the skin, and other signs of putrefaction, recover in the space of a few hours by means of appropriate relief! In some cases, these phenomena were occasioned by the mortification of a limb.

4. The cadaverous state of the face, of which Hippocrates has given the following description, has been regarded as a sign of real death: the forehead wrinkled and dry, the eyes sunken, the nose pointed, and bordered with a violet or black

circle; the temples sunken, hollow, and retired; the ears sticking up, the lips hanging down, the cheeks sunken, the chin wrinkled and hard, the colour of the skin leaden or violet, the hairs of the nose and eye-lashes sprinkled with a kind of yellowish white dust. Taken separately, this sign is of no value, since it is sometimes observed in patients twenty-four or forty-eight hours before death, and on the other hand, it is often absent in cases of sudden death.

5. The softness, flaccidity, and dimness of the eyes, have been considered by some celebrated physicians, as a certain sign of real death. If it be true that in general the eyes become dull and sink after death, it is equally true that this effect is not always observed, that it sometimes occurs during life, and that, consequently, it is not sufficient to establish the reality of death, when taken alone.

6. The absence of the circulation, the impossibility of feeling the pulsations of the heart and arteries, have been regarded as infallible means of deciding whether the individual is dead; but it is perfectly proved that a person may live several hours without its being possible to perceive the slightest movement in the parts just mentioned: this sign is therefore one of those which has the least value. It even sometimes happens that it is very difficult to decide whether the pulse and heart beat or not, either because the

pulsations are very feeble, or because the arteries and the heart are displaced.

7. It has been thought right to admit that an individual was dead when he *no longer respired;* and to ascertain the exercise of this function, several means have been imagined: some have presented the flame of a candle or a bit of carded wool to the mouth and nostrils, and have concluded that the persons no longer respired when these substances were not agitated; others have drawn the same conclusion when a looking-glass placed before the mouth was not tarnished; lastly, others have recommended to put a glass filled with water a little above the pit of the stomach (the patient lying upon the back) being persuaded that if the water were agitated, the respiration still existed. Experience proves that none of these signs are sufficient to establish the reality of death.

8. It has been thought that an individual was dead when he was cold, and that he still lived if the warmth of the body was preserved. There is, perhaps, no sign of so little value: in fact, the drowned who may be recalled to life, and several other individuals still living, are usually very cold; whilst in asphyxia, &c. a certain degree of warmth is preserved even for a long time after death.

9. Incisions, burning, blistering, and cupping glasses, sometimes employed to ascertain whether a person be dead or not, ought to be considered

as secondary means, since experience proves that in certain diseases, the sensibility is diminished to such a degree, that the patients do not experience any pain, even three or four days after their application. These processes should only be considered as valuable when they furnish positive results, that is to say, when the persons who have been thought dead experience pains, and consequently give signs of life: in the contrary case, we should avoid affirming that the individual is dead.

Conclusion.

It results from what has been said:

1st. That no one of the enumerated signs, taken separately (except well characterised putrefaction), is sufficient to prove that a person is dead.

2d. That death ought to be regarded as real in an individual who presents the whole of these signs.

OF BURNS.

Of superficial Burns of small extent.

117. When we are called to attend an individual who has just been burned, we should plunge the part into very cold water, containing some extract of saturn (sub-acetate of lead) and quicklime: this mixture is prepared by suspending a

drachm of quick-lime in a pint of water, and adding two table-spoonfuls of the extract. This liquid should be renewed as soon as it becomes warm, and the burned part kept in it several hours together. When, by this means, the pain is nearly removed, the diseased part is to be removed from the bath and wrapped in bandages dipped in the same liquid, with which they should be sprinkled from time to time. If the extract of saturn cannot be procured, lime water, cold simple water, and even ice, should be employed.

If, in consequence of the form of the burned part, it be impossible to place it in a local bath, we must bathe it by means of a sponge, with the same liquid. Experience daily confirms the efficacy of this remedy; it further proves that it may be employed with the greatest success a quarter or half an hour after the accident, even when blisters are formed.

When the irritation is diminished, and the pain subsided, and after several days have elapsed, the blisters, if any exist, should be opened: for this purpose, one or two small punctures are made with a needle at the most depending part, and the serosity left to flow. There would be an inconvenience in not piercing these blisters, or in doing it too soon: in the former case, the accumulated serosity might occasion ulcers; in the latter, the air would irritate too powerfully the surface of the wound and augment the pain.

All the parts deprived of the scarf skin or epidermis, and those which correspond to the blisters, should be covered with a soft rag or with fine blotting paper, spread with simple cerate; this should be covered with compresses dipped in a solution of the extract of saturn in water.

The simple cerate might be replaced with the greatest success by Goulard's cerate, if the sensibility of the part is destroyed: if not, it would be hurtful, because it would augment the suffering.

When the pain is so acute, that the weight of the cloths is insupportable to the patient, a liniment should be prepared with equal parts of lime-water and linseed or olive oil, and, by the aid of a hair pencil or feather, a thin layer of it applied upon the naked part: suppuration is soon established; the wound is to be dressed twice a day, the dressings to consist of soft linen rags impregnated with cerate; it is important that these dressings should be pierced in several places, in order to give issue to the pus.

118. If, notwithstanding the employment of the extract of saturn, inflammation should occur in the burned part, it must be covered with a cataplasm, prepared by boiling the roots of marsh-mallows and two or three poppy heads, adding as much linseed meal or crumbs of bread as may be necessary to give it a proper consistence.

Of very extensive superficial Burns.

119. When the burn is superficial, yet occupying a large surface, the disease is dangerous, and may even become mortal. The pains are excruciating, the inflammation considerable, and the fever very violent. It is then necessary to bleed once or twice, to forbid every sort of food, without even excepting broth, and to administer a decoction of linseed, or mallows root, or simply sugar and water. A spoonful of the antispasmodic potion, described § 6, should be given every half hour.

Independent of these internal means, all the burned parts should be covered with blotting paper spread with simple cerate, or, better still, with Goulard's cerate, if the patient can support it: if, however, the pain should be very acute, emollient and relaxing applications must be employed, such as the decoction of linseed, of mallows root, &c.

If the burn has been produced by gunpowder, the grains of powder should first be removed with the point of a needle.

Of deep Burns.

120. If the burn be deep, and if there be sloughs, or parts reduced as it were to charcoal, and surrounded by a more or less red inflamma-

tory circle, we should apply the emollient cataplasms, of which we have spoken § 118, as well as the simple cerate, and wait until the slough separates. When portions of this slough are ready to fall, they should be cut off with a pair of scissors.

The wound which results from the separation of the gangrened parts, should be treated as a simple ulcer; it must be dressed once or twice a day with lint, abandoning the use of ointments, which the ancient surgeons esteemed so highly; it is only towards the termination, when the cicatrisation is nearly completed, that it is expedient to surround the edges with a strip of linen rag spread with cerate: by this means their adherence to the lint is prevented, as well as too great irritation of the wound, which would hinder the cicatrisation.

ADULTERATED WINES.

121. Wines may be adulterated by a number of substances. The object of the fraud is to hide some of their defects, and to give them colour, odour, or strength.

Amongst the substances employed by merchants, there are some which are not dangerous; others, on the contrary, are more or less injurious, and cannot be swallowed without giving rise to symptoms, which may even sometimes be

followed by death. This consideration induces us to describe the means by which it may be ascertained that wines have been adulterated.

Of Wines adulterated with Lead.

In order to correct the acidity and sharpness of certain wines, they are sometimes mixed with the acetate of lead, (salt of saturn,) ceruss or white lead, and still oftener with litharge (protoxide of lead). These preparations give to the wine a sweet taste. Of all the frauds this is the most dangerous. The persons who drink of liquors adulterated by these preparations, experience all the symptoms of which we have spoken in the article lead, § 53.

White wines. White wines adulterated with lead, independent of an astringent sweet taste, possess several properties by which they may be recognised.

1st. They scarcely redden the tincture of turnsole, because the acid, which they naturally contain, is saturated by the oxide of lead.

2d. Sulphuric acid, (oil of vitriol,) or the sulphates dissolved in water, such as Glauber's or Epsom's salt, &c. render them turbid, and produce a white precipitate, which soon falls to the bottom of the vessel in which the experiment is made. The deposit does not disappear by the addition of water.

3d. The hydro-chloric acid (muriatic) or the

hydro-chlorates in solution, such as salt water, also produce a white heavy precipitate, which is soluble in twenty-five or thirty times its weight of water.

4th. The sub-carbonates of potash, soda, and ammonia, act in the same manner. The white precipitate which they occasion, is insoluble in water, but dissolves readily in pure nitric acid (aquafortis).

5th. Chromic acid and the chromate of potash, throw down a precipitate of a very fine canary yellow.

6th. Sulphuretted hydrogen, (hydro-sulphuric acid,) the hydro sulphates, or the liver of sulphur, dissolved in water, and poured into white wines adulterated with lead, blacken them, and throw down a black deposit at the end of a few minutes.

7th. If the precipitates obtained by these processes be collected upon filters, and after having been dried, be mixed with powdered charcoal and caustic potash, and heated to redness in a crucible for half an hour, metallic lead is obtained, which is easily recognised, 1st, by its deep blue colour; 2d, by the facility with which it is furrowed by the nail; 3d, the promptitude with which it is dissolved in aquafortis, giving rise to a liquid salt of a sweetish taste, which is precipitated white by the sulphates, the hydrochlorates, and the carbonates.

8th. White wines adulterated with lead, are

precipitated white by the solutions of potash and soda, and by the volatile alkali.

9th. Evaporated in a capsule at the temperature of boiling water, they yield a mass, which being calcined to redness with powdered charcoal, furnishes, at the end of thirty or forty minutes, a button of metallic lead. This character is sufficient to establish the existence of lead in wines.

Red wines. Red wines adulterated with the preparations of lead, never present so deep a colour as they possessed before adulteration; they are of a pale red.

The presence of lead may be shown by means of the same agents which serve to discover this metal in white wines. It is only necessary to note:

1st. That the hydro-sulphates may lead into error if we content ourselves with examining their action superficially. In fact, red wines give with these agents a black precipitate; but the greater number of red wines, which do not contain lead, exhibit nearly the same phenomenon; they become black, and finish by depositing flakes of a blackish violet colour. It is therefore necessary, when we wish to take advantage of the character furnished by the hydro-sulphates, to add, that the blackish precipitate which they form in the red wines indicates the presence of lead, if, after having been collected upon a filter and calcined with potash and charcoal, it affords metallic lead.

Of Wines adulterated with Alum.

The object of the sophistication of wines by alum, is to render them redder and less changeable, and to give them an astringent taste. The dangers of this fraud are generally known; the digestion becomes painful, and is followed by vomitings, obstructions, hemorrhage, &c.

The following characters, which belong to alum, have been thought capable of showing the presence of this substance in wines.

1st. Their taste is acid, slightly sweet, and astringent.

2d. They redden turnsole paper very powerfully; because, independent of their proper acid, they contain the uncombined sulphuric acid of the alum.

3d. They give a white or coloured precipitate by ammonia (volatile alkali), which is not dissolved by an excess of alkali.

4th. They are also rendered turbid by caustic potash dissolved in water, but the precipitate disappears in an excess of potash.

5th. The sub-carbonate of potash precipitates them, and does not re-dissolve the deposit.

6th. The acetate, nitrate, and hydro-chlorate (muriate) of barytes, throw down an abundant precipitate, insoluble in water and in pure nitric acid (aquafortis).

If it be true that, in certain circumstances,

wines containing alum exhibit the characters which have been just described, it is equally true that certain wines which do not contain an atom of this substance, present some of those characters, and more especially, that there are others in which, notwithstanding the presence of alum, it is impossible to verify all those characters, because they contain some other substances besides alum: whence we must conclude that they are not of as much value as has been pretended, and that they should be regarded at most as secondary characters.

7th. Of all the means proposed for detecting alum in wines, the following appears to us to merit the preference. Several pints of wine being evaporated in a capsule, a reddish mass is obtained, composed of alum, colouring matter, and tartar, which made a part of the wine. This mass is dissolved in a large quantity of water, and boiled with powdered charcoal of the tillia or linden tree; by these means an almost colourless liquor is obtained, which is filtered, poured into a capsule, and evaporated by a gentle heat; when a pellicle forms, it is removed from the fire and put in a cool place: the tartar crystallises, and the alum is contained in the supernatant liquor.

This liquor should have an astringent sugary taste; it should give a white precipitate with the volatile alkali and caustic potash; that which is formed by the latter substance should be soluble

in an excess of potash. The solution of barytes, the acetate or hydro-chlorate of barytes, ought to render it turbid, and cause the deposit of a white precipitate, which is insoluble in water and in nitric acid.

Of Wines adulterated with Chalk.

Chalk has been added to white or red wines that were disagreeably acid, in order to saturate the acetic and tartaric acids, and to destroy the sharp taste by their combination with the lime of the chalk. Wines treated by this substance are actually sweeter; but they may occasion disagreeable symptoms if they contain too great a quantity of the acetate of lime.

The fraud may be recognised by the following characters:

1st. Several pints should be boiled in a capsule, or in closed vessels, if we wish to collect the alcohol; when the liquor is reduced almost to the consistence of syrup, it should be mixed with five or six ounces of distilled water, then shaken for the space of ten or twelve minutes, and the liquor filtered, which will be found to contain the acetate of lime, formed from the acetic acid of the wine and the lime which entered into the composition of the chalk: the tartar contained in the wine, not being dissolved, will remain upon the filter.

2d. Some oxalate of ammonia should be

poured into this liquor, which will cause a white or coloured precipitate of oxalate of lime, if the wine really contained lime: this precipitate, collected, washed, and dried upon a filter, will yield quick-lime when calcined in a crucible.

3d. The quick-lime will be recognised by its property of dissolving in water, of changing into green the blue colour of the syrup of violets, of being precipitated white by the carbonic acid, and of not being rendered turbid by the sulphuric acid.

Of Wines adulterated with Brandy.

It sometimes happens that poor wines are corrected by the addition of brandy. It is also true that wine is fabricated by mixing together cyder or any other spirituous liquor, brandy, and saunders or sandal-wood, log-wood, or any other colouring matter. These falsifications have no other inconvenience than that of occasioning intoxication more readily; they also frequently occasion headachs.

It may be known that wine has been strengthened by the addition of brandy by the following characters:

1st. It will have a much more penetrating odour of brandy than that of pure wine: in fact, the latter contains only the spirit which has been developed during the fermentation, and which is

intimately combined with the other parts of the liquid; whilst, in the brandied wine, the liquor added is in some sort free, and renders itself evident to the sense of smell.

2d. For the same reason, the taste of wine adulterated with brandy, is much hotter than that of pure wine.

3d. According to M. Remer, when wine containing brandy is distilled over a very slow fire, and the recipient often changed, the brandy passes first into the recipient, even before ebullition: some time after, water is obtained, and afterwards alcohol. Wines which contain no brandy, submitted to the same experiment, give, on the contrary, at first water, afterwards alcohol, and lastly water. This character does not appear to us correct.

Methods employed to give colour to Wines.

Old wines being, in general, more coloured than new, it may be readily conceived that dealers in wine have endeavoured to give more colour to the latter.

White wines.—1st. Pale wines are sometimes exposed to the air; their colour becomes deeper: it is then said *that they rust:* this mode is without danger.

2d. The same thing may be said of that which consists in colouring wines by means of burnt sugar.

3d. A yellowish tint may be given to these liquids by means of sulphureous acid gas: for this purpose they are poured into a cask in which sulphur has been burned: this fraud is dangerous, if the acid be in considerable quantity. Wine adulterated in this way has an odour similar to that of burning sulphur, which it loses after being boiled for a quarter of an hour.

4th. Pale wines have sometimes been coloured with whortle berries, (*vaccinium myrtillus,*) with campeachy or log wood, &c. substances which have also the property of rendering them more astringent. This fraud, which is not accompanied with any danger, may be recognised by the difficulty of removing the stains made by these wines upon the table linen, &c.

Of Wines adulterated with sweet and astringent substances.

1. Sugar, box-raisins, or sweeter wines, are sometimes added to wines: this addition is without danger.

2. In certain circumstances, in order to render the wine more astringent, some extract of oak, or willow bark, &c. is added: this practice is not accompanied with any inconvenience.

Of Wines adulterated with some other substances.

Wines may sometimes contain arsenious acid, copper, antimony, &c. and give rise to the most fatal symptoms. We do not believe that such adulteration has ever been attempted by merchants; but as these poisonous substances may *accidentally* be found in wines, it becomes indispensable to make known the proper means of detecting them.

Of Wines containing Arsenious Acid (White Arsenic of commerce).

1. A mixture composed of 10 parts of red wine and one part of dissolved arsenious acid, is precipitated of a deep yellow by the *hydro-sulphurie* acid (sulphuretted hydrogen), blackish blue by the ammoniated sulphate of copper, and white by the nitrate of silver.

2. A mixture composed of 10 parts of red wine and seven of arsenious acid, is precipitated golden yellow by the hydro-sulphuric acid, green by the ammoniated sulphate of copper, and white by the nitrate of silver.

3. The best means of ascertaining the presence of arsenious acid, consists in collecting upon a filter the yellow precipitate formed by the hydro-sulphuric acid, and in heating it in

a narrow and long tube of glass, with equal parts of caustic potash and of charcoal: a few minutes exposure to a red heat is sufficient to volatilize the metallic arsenic which attaches itself to the sides of the upper part of the tube, glittering like steel, and which being thrown upon burning coals, diffuses an odour of garlic.

Of Wines containing a Salt of Antimony.

1. Antimoniated wine evaporated in a porcelain capsule, and calcined in a crucible, together with charcoal and potash, gives metallic antimony, the characters of which have been described page 36.

2. It is not precipitated by water.

3. With the hydro-sulphate of potash, it gives a deep red precipitate, unless a large quantity of hydro-sulphate be employed: in this case the precipitate is black.

4. The sulphuric acid (oil of vitriol) gives rise to a deep yellow deposit, inclining slightly towards grey.

5. The alcoholic infusion of galls precipitates it of a dirty white.

It sometimes happens that red wines containing tartar emetic, are precipitated reddish yellow or green by the hydro-sulphate of potash, deep violet by the sulphuric acid, and clear violet by the infusion of galls; whence we think it may be concluded to be necessary, in order to ascertain

the existence of an antimonial preparation in wine, to calcine it with charcoal and potash, and separate the metallic antimony.

Of Wines containing a Salt of Copper.

1. A mixture of ten parts of red wine and one part of a concentrated solution of verdigris, is precipitated black by the hydro-sulphate of potash, of soda or ammonia, chesnut-brown by the prussiate of potash, and very deep grey by ammonia. This last precipitate is not entirely dissolved by an excess of alkali, and the supernatant liquor is never blue.

2. The same quantity of wine united to seven parts of a solution of verdigris, gives analagous precipitates, with the exception of that by ammonia which is of a black colour.

3. The best method of ascertaining the existence of a salt of copper in wine, consists in evaporating it, and calcining the mass thus obtained with charcoal and potash. After being exposed to a red heat for half an hour, the copper is obtained, and easily known by its colour.

FINIS.

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