

Considerations on the use and abuse of antimonial medicines in fevers, and other disorders; containing a chemical examination of all the antimonial preparations in the several dispensatories; and a special enquiry into the nature, properties, and effects, of febrifuge medicines, particularly emetic tartar, Dr. James's and the Edinburgh powder.

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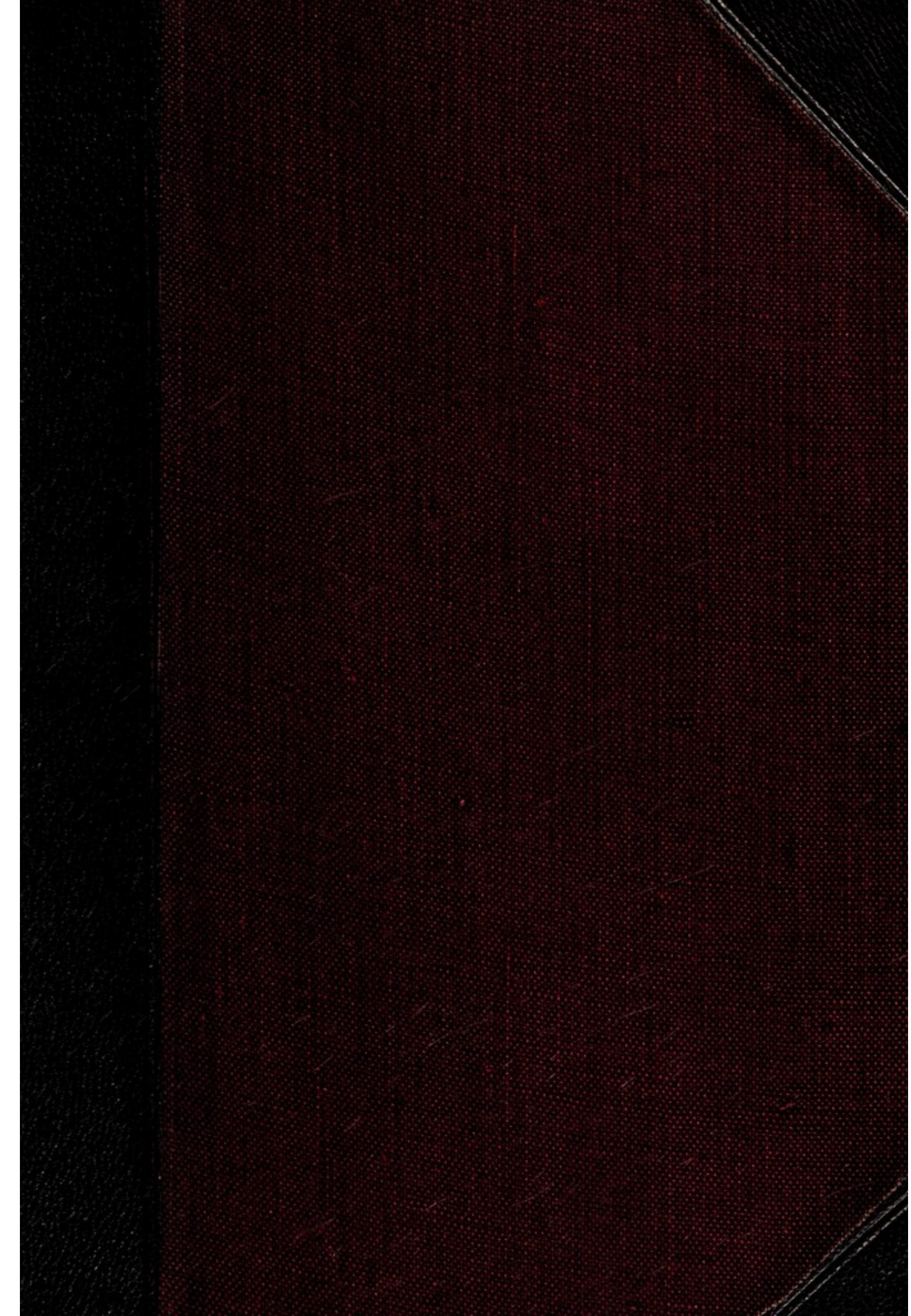
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CONSIDERATIONS ...



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FRANKLIN
MEDICAL SOCIETY



XVII 3

CONSIDERATIONS
ON
THE USE AND ABUSE
OF
ANTIMONIAL MEDICINES, &c.

[Price One Shilling.]

COLLEGE OF AGRICULTURE

NO. 2

THE UNIVERSITY OF CALIFORNIA

BERKELEY, CALIF.

1910

CONSIDERATIONS

ON

THE USE AND ABUSE

OF

ANTIMONIAL MEDICINES

IN

FEVERS, AND OTHER DISORDERS;

CONTAINING

A CHEMICAL EXAMINATION
OF ALL THE ANTIMONIAL PREPARATIONS
IN THE SEVERAL DISPENSATORIES;

AND

A SPECIAL ENQUIRY
INTO THE NATURE, PROPERTIES, AND EFFECTS,
OF FEBRIFUGE MEDICINES,

PARTICULARLY

EMETIC TARTAR,
Dr. JAMES'S AND THE EDINBURGH POWDER,

READ IN A SOCIETY OF PHYSICIANS,

AND PUBLISHED BY ORDER OF
THE PRESIDENT AND COUNCIL.

L O N D O N,

PRINTED FOR JOHN MURRAY, BOOKSELLER,
NO. 32, FLEET-STREET.

MDCCLXXIII.

CONSIDERATIONS

ON

THE USE AND ABUSE

OF

ANTIMONIAL MEDICINES

IN

SCURVY AND OTHER DISORDERS

CONTAINING

A CHEMICAL EXAMINATION

OF ALL THE ANTIMONIAL PREPARATIONS

IN THE SEVERAL DISPENSATORIES

AND

A SPECIAL ENQUIRY

INTO THE NATURE, PROPERTIES, AND EFFECTS

OF THESE SEVERAL

PREPARATIONS

EMETIC TARTAR

BY JAMES W. BUCHANAN, ESQ.

READ IN A SOCIETY OF PHYSICIANS

AND PUBLISHED BY ORDER OF

THE PRESIDENT AND COUNCIL

LONDON

PRINTED FOR W. B. MOORE, BOOKSELLER,

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P R E F A C E.

THE Author of the following Paper claims the indulgence of his Medical readers for any inaccuracy or negligence of style which may occur; he having determined to print the whole, scrupulously, from the identical copy which he had the honour to read in the Society, without any correction or alteration whatsoever. The paper was written, or rather copied from loose notes, at a time when he had no leisure for revival. The Experiments, however, which produced the Antimonial Salt, were made with all that attention, accuracy, and

and perseverance, which chemical enthusiasm alone can inspire and support.

Whether he was justifiable in persuading the Society to permit the Powder to be publicly sold under their sanction, the world must determine; but he knew no other method to render it of universal utility.---So much for himself.

As to the Society, if any apology be required, let it be remembered, that, though every individual was convinced, as soon as the process was explained, that a perfectly *soluble* and *invariable* Antimonial was produced, nevertheless they did not recommend it to the public, until every Member separately had,
by

by repeated trials during several months, convinced himself of its certainty and power.

In short, after mature deliberation, and frequent discussion of the matter, the Society were unanimously agreed, that there is no possible means of securing to the public a Medicine of Importance (especially one that requires care, expence, and honesty, in the preparation) but by having it made under the inspection of a Society of Physicians, whose reputation depends on the efficacy of the medicines they prescribe.

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Considerations, &c.

BEFORE I proceed to investigate the subject which the Society hath thought fit to allot to my particular consideration, namely, *The use and abuse of Antimonial preparations in Fevers and other diseases*, let me first express my gratitude for the honor done me in supposing my capacity equal to so difficult a task. I acknowledge, my vanity was such, that when I heard the subject proposed, I foresaw no obstacle sufficient to obstruct my progress, little apprehensive that, having reached the summit of one mountain, still new Alps would arise more tremendous than the last. Be it as it may, I have nothing to impute to negligence; nor have I any other excuse to alledge in extenuation, save what may be allowed to

a want of that leisure which so important a subject requires.

To enter into a minute discussion of that disease of the body which we denominate Fever, were, in this society, impertinent ; nevertheless, the subject with which I am intrusted, seems to demand some previous remarks on Fevers in general.

A fever is a very common disease. Even our nurses know it so well, that they seldom mistake it for any other disorder. And yet, when we are asked what are the symptoms that constitute a fever, we are puzzled with the question, and our several definitions are found to vary considerably from each other.

In a body in perfect health, the pulse moves regularly at the rate of about sixty to eighty strokes in a minute ; but after a full meal, or a few glasses of wine extraordinary, it generally exceeds ninety, without any apparent inconveniency. Violent exercise or passions of the mind will frequently increase the number of pulsations to a hundred, without producing any one symptom of disease. A quick pulse therefore does not constitute a fever.

Exercise

Exercise of the body will not only accelerate the pulse, but will add considerably to its magnitude or fullness, and the degree of heat will be proportionably augmented; nevertheless the functions are unmolested, and no disease succeeds. A quick and full pulse, together with unusual heat of body, therefore, do not necessarily constitute a fever, so long as the natural and animal functions continue unimpaired.

A quick pulse, and heat above the natural standard, are also often the consequence of topical inflammation, the animal functions still retaining their usual vigor.

From these previous considerations, I humbly conceive the essential symptoms of a fever to be, an increased velocity of pulse, total loss of appetite, general debility of body, and heat above the natural temperament. These, I think, are the constant symptoms of an acute fever. I say, an Acute fever; the disease commonly called a Slow or Nervous fever being no part of the object of my present consideration.

Acute fevers are variously subdivided. But before I speak of these subdivisions, it

is necessary that I should exclude Inter-mittents of every kind, because antimonial medicines are in these cases ineffectual, or at least unnecessary, since we are provided with another almost infallible remedy.

I have great veneration for the ancients ; I allow them all the merit they deserve, and confess myself much beholden to them : nevertheless, after mature reflexion, I conceive that acute fevers are most rationally and usefully divided into *Inflammatory* and *Putrid* only, because every subdivision of each requires the same treatment.

But when I say that every species, or rather variety, of inflammatory and putrid fevers requires, respectively, the same treatment, I do not speak absolutely : I mean only to assert, that every acute fever is either inflammatory or putrid ; and that, the general treatment of every subdivision of each being the same, farther distinctions are unnecessary.

There is not a member of this society who does not know, that, since the first introduction of antimonial medicines into practice, they have often been attended with considerable success. What mischief
they

they have done, we cannot tell, because mankind in general want honesty. There is an axiom in physic, which says, that all good medicines are dangerous: like instruments of surgery, the better they are, the more easily will they destroy the patient, in the hands of an unskilful operator.

Antimony is undoubtedly the most active substance in nature (at least that we are acquainted with) when taken into the stomach of the human body. I am talking to gentlemen well versed in chemistry; therefore it is unnecessary to say, that, in speaking of the virulent activity of Antimony, I do not mean the crude mineral commonly so called, but the *Regulus* separated from its sulphur.

Various means have been devised to render this very extraordinary substance less violent in its operation, and consequently more manageable: but the misfortune has been, that when antimony was first introduced as a medicine, chemistry was very little understood; and, to add to the misfortune, the practice of physic was at that time founded on very irrational principles. Hence it follows, that, in the exhibition

hibition of antimonial medicines, a great deal was left to chance; the preparations were uncertain, and they were often improperly administered.

These disadvantages notwithstanding, antimonial medicines have frequently been given, in fevers, with astonishing success, even by the most ignorant people; which can only be ascribed to favorable accidents both in the preparation and application of the medicine. Hence the universal temporary fame of various antimonials; but hence also the reluctance of rational physicians in prescribing medicines of such precarious effect.

From what I have said, and from what you all certainly know, I believe I may reasonably conclude, that there is a febrifuge virtue in Antimony, which does not exist in any other substance of the *materia medica*; and that the first desideratum is a *safe, effectual, and invariable* preparation of that semi-metal. I say the *first* desideratum, because there is a *second* of equal importance, namely, the *time* of exhibition. If my enquiries have enabled me to fix these hitherto variable points, with any tolerable precision,

precision, I flatter myself, I shall have contributed something towards the improvement of a very important branch of our profession.

I shall now proceed to examine the several preparations of antimony, with which I am acquainted; but, lest I should seem immethodical, I shall beg leave to say something concerning its natural history and general properties.

The ore of antimony, as it comes from the mine, consists of a semi-metal, called *Regulus of antimony*, sulphur, earth, stones, &c. It is found in some parts of England, but is generally imported from Hungary, or from France.

The different species of antimonial ore are,

1. *Striated ore*, of a bluish-grey colour, shining, and scaly.
2. *Crystallised ore*, striated within, but externally crystalline.
3. *Red antimonial ore*, mineralised with sulphur and arsenic. This resembles some kinds of iron ore, or blend; melts in the flame of a candle.

Antimony is also sometimes found in plumose silver ore, and in what is called Stibiated Lead Ore.

Wallerius tells us, that the pure semi-metal hath been found native in Sweden.

Being taken from the mine, in order to separate the ore from the earth and stones, it is generally fused in a crucible with holes in the bottom, through which it passes into a conic receiver: this gives it the form in which it is brought to us. This antimony consists of the regulus combined with sulphur in various proportions.

Crude antimony is, in general, not violent, but very uncertain in its operation, owing to the indeterminate proportion of the sulphur; therefore it is very improperly used in medicine. It is frequently given in large doses to horses: the farriers are of opinion, that it gives the animal what is called a fine coat.

The general properties of this semi-metal are as follow.—It is white, fibrous, and brittle. Its specific gravity to water is as 7,500 to 1000. Volatile in the fire. Soluble in the muriatic acid, and in *aqua regia*, from which it may be precipitated
by

by water. Vegetable acids dissolve it in very small proportion; yet this solution is violent in its operation. The nitrous and vitriolic acids corrode it into a powder, reducible by water or fire into a mere calx. These two acids also expel it from the marine acid, and thus reduce it to a calx. If previously melted with lime, it will amalgamate with mercury. United with sulphur, or partly calcined with nitre, its virulent activity in the primæ viæ is much abated. When entirely deprived of its phlogiston by calcination, it becomes quite inert, acquiring additional weight. It is soluble in *hepar sulphuris*.

Its affinity, or attraction, to other metals, stands thus; iron, copper, tin, lead, silver, gold:—to acids, thus; vitriolic, nitrous, muriatic, vegetable.

Such are the general properties of this extraordinary semi-metal, from which the phænomena observable in the following chemical processes are deduced. But Sulphur, with which this regulus is combined in its crude state, being also a considerable chemical agent, it may not be amiss to recollect its nature and properties likewise.

Sulphur consists of vitriolic acid, combined with a very small proportion of phlogiston. It is fusible in a very moderate degree of heat, and is totally volatile in the fire. It is not soluble in water, nor ardent spirit, nor in any acid; but it is soluble in oil. It combines with fixed alkali, forming hepar sulphuris. It is soluble in volatile alkali. It promotes the fusion of metals. Its affinities are in the following order; namely, alkalies, quick-lime, iron, copper, lead, tin, regulus of antimony; from which last therefore it may be separated by any of the preceding.

It is also necessary, before we proceed, to observe, that acids in general have a stronger attraction to phlogiston, and to alkalies, than to metallic substances.

Let us likewise remember, that metals in general have a greater affinity with acids than with sulphur.

Crude antimony, I have said, is a combination of the semi-metal called Regulus of Antimony, and sulphur; but various as to the proportions, and consequently various in its operation; for sulphur, thus combined with the regulus of antimony, destroys

it destroys its activity in proportion to its quantity. For medical, and other purposes, they are separated by the following means.

Let crude antimony be roasted, so as to reduce it to an imperfect calx; then fuse it with black flux, or with soap.

Sulphur, being volatile in the fire, is, in the first operation, gradually dissipated; but the metal is also at the same time deprived of a considerable part of its phlogiston, which the second operation effectually restores. The regulus subsides to the bottom of the crucible, and may be separated from the scoria by the stroke of a hammer.

The black flux employed in this operation is made by detonating two parts of tartar with one part of nitre. This proportion of nitre not being sufficient to consume all the inflammable principle of the tartar, the remaining alkali retains a sufficient quantity of phlogiston to restore the regulus.

But this previous roasting of crude antimony is tedious. The following method is more expeditious.

Crude antimony, four parts.

Tartar, three.

Nitre, two and a half.

These being mixed and pulverised, throw them gradually into a red-hot crucible, and increase the fire till the fusion is complete. The regulus will be found at bottom, and the scoria at top, which may be separated from each other by the stroke of a hammer.

In this process, the pure regulus is obtained by a single operation. The nitre and tartar form the black flux above mentioned, which prevents the calcination of the metal. The regulus, from its gravity, falls to the bottom. The scoria consists, *first*, of an alkaline salt, from the nitre and tartar; *secondly*, of an hepar sulphuris, from the sulphur, and part of the alkali; *thirdly*, of a part of the regulus dissolved by the hepar sulphuris; and, *fourthly*, of some vitriolated tartar, formed by the acid of the sulphur uniting with the fixed alkali.

Or the regulus may be obtained thus :

Antimony, two parts.

Alkaline salt, one part.

Mix and fuse them in a crucible, as above directed.

Or thus :

Antimony,

Nitre,

Crude tartar, of each equal parts.

[This was formerly a preparation of the Edinburgh Pharmacopœia. But it is evident, that here the quantity of hepar sulphuris is so great as to dissolve too great a proportion of the regulus, which thus mixes with the scoria. Some were of opinion, that, though the quantity of regulus was less, it was of a superior quality; but certainly without foundation.]

Or thus :

Horse-shoe nails, one part.

Antimony, two.

Throw the nails into a crucible, and make them white-hot ; then throw in the antimony, and increase the heat till the whole is in perfect fusion.

This process requires great heat ; therefore, to accelerate the fusion, it is common to add two parts of nitre, which being alkalised forms an hepar sulphuris : this dissolves a part of the regulus, and renders the scoria more fluid.

The French chemists order the fusion to be thrice repeated, with the same quantity of nitre each time, in order to obtain the regulus more pure, or with an intention to procure what is called Stellated Regulus: but the stellated appearance depends chiefly, after perfect fusion, on its cooling slowly. The separation of the regulus of antimony from its sulphur by means of iron, is founded on sulphur having a stronger attraction to iron than to antimony. The regulus therefore subsides, and the iron and sulphur combine in the form of scoria. The regulus thus obtained is called Martial regulus. Horse-shoe nails are in this process preferred, because they are always made of soft iron, which is easily fused. As to the stellated appearance, it is of no peculiar importance either in arts or medicine.

Others, to obtain the martial regulus, have taken

Horse-nails, two pounds and a half.

Antimony, one pound.

Nitre, four ounces.

Tartar, two ounces.

Here the proportion of iron is manifestly too great; an equal weight with the antimony being sufficient.

Or thus :

Antimony,

Nitre,

Tartar, each one pound.

Iron, half a pound.

This was in a former edition of the Edinburgh Pharmacopœia. Here the proportion of nitre and tartar is much too great.

Or thus :

Antimony,

Iron nails, each one pound.

Sal enixus, half a pound.

Salt of tartar, two ounces.

This sal enixus is the caput mortuum remaining after the distillation of Glauber's spirit of nitre. This is the process said to be used by the pewterers for obtaining the martial regulus.

Notwithstanding the difference in the preceding operations, both in the nature and proportion of the materials, the intention
of

of the chemist was only to produce a pure regulus of antimony, which, by whatever means obtained, is always the same: therefore the terms *Martial* regulus, or *Stellated* regulus, as terms of distinction, are ridiculous. But, with regard to medicine, the regulus of antimony is much too violent in its operation. Formerly indeed cups were formed of it, for making antimonial wine; also pills, which were called Perpetual. They are long since exploded.

I now proceed to the preparations of antimony, which are intended for medical purposes only.

SULPHUR ANTIMONII PRÆCIPITATUM.

Antimony, sixteen ounces.

Tartar, twelve.

Nitre, six.

Fuse these together in a crucible; separate the scoria from the regulus with a hammer; dissolve the scoria in water; filter the solution, and precipitate the sulphur, by dropping into it some spirit of sea salt; wash the sulphur from the salts, and dry it for use.

This

This is from the London Dispensatory, taken originally from Lemery. The scoria, used in this process, consists chiefly of regulus of antimony, dissolved in hepar sulphuris, which is soluble in water. On dropping into it the spirit of sea salt, the sulphur and the regulus precipitate, because the alkali unites with the muriatic acid, in preference to the sulphur with which it was combined; for, though sulphur has a stronger attraction to alkalies than to any other substance, yet alkalies prefer acids to sulphur.

Or,

SULPHUR AURATUM ANTIMONII.

Powder the scoria obtained by the foregoing process, and boil it for a considerable time in thrice its weight of water; filter, and drop into it spirit of vitriol quantum sufficit; wash, and dry the precipitate as above.

This was formerly in the Edinburgh Dispensatory; but, in the last edition, the following hath been substituted.

Soap lyes, four pints.

Water, three.

Antimony powdered, two pounds.

Boil them three hours, adding more water occasionally; filter the solution, whilst hot, through flannel; drop spirit of nitre, mixed with equal quantity of water, q. s. then wash the precipitated sulphur with hot water.

Or,

Antimony,

Pearl ashes, equal parts.

Powder and mix them well; fuse them in a crucible; separate the scoria; boil it in water; filter, and drop in spirit of salt, as above.

The precipitate obtained by the four preceding operations, is, as to its constituent parts, evidently the same; for, whether we use the scoria as in the two first, or soap lyes or pearl ashes as in the two last, the result of the first part of the process is a solution of the regulus of antimony in hepar sulphuris: nor does it make the least alteration in the medicine, whether we precipi-

tate

tate with vitriolic, muriatic, or nitrous acid: they all equally unite with the alkali of the hepar sulphuris, and the sulphur with the regulus falls to the bottom.

These precipitates of antimony are violently emetic in small doses; but they are very uncertain in their operation, because the quantity of regulus depends on circumstances incapable of being ascertained in the preparation.

CROCUS ANTIMONII. Pharm. Lond.

Antimony,

Nitre, equal parts.

Fuse in a white-hot crucible, and separate the crocus from the scoria with a hammer.

Or,

CROCUS METALLORUM. Pharm. Edinb.

Made in the same manner as the last, with the addition only of ordering it to be several times washed.

Or, by trading chemists, thus.

Antimony, sixteen pounds.

Nitre, fourteen pounds.

Sea salt, one pound.

Put the ingredients into an iron pot ; set fire to them with a red-hot iron rod, and let them burn out.

The result of these three operations is a *crocus* (as it is foolishly called) of antimony, retaining so much of its phlogiston, as to render it violently emetic. It is seldom used, except for horses.

CROCUS ANTIMONII LOTUS. P. Lond.

Boil the crocus, and wash it several times in warm water.

This boiling and washing does no more than free it from the salts. It is intended for the preparation of tartar emetic.

CROCUS ANTIMONII MITIOR. Lewis.

Antimony, two parts.

Nitre, one.

Deflagrate in a crucible.

This is milder, because less of the sulphur is consumed.

REGULUS ANTIMONII MEDICINALIS.

Lewis.

Antimony, eight parts.

Nitre, one.

Deflagrate, and powder the whole.

Evidently milder than any of the foregoing ; but equally uncertain.

EMETICUM MITE.

Antimony, one part.

Nitre, two.

Deflagrate.

From Boerhaave.—Here not only all the sulphur, but much of the phlogiston of the regulus is consumed ; therefore it is mild.

CALX ANTIMONII. P. Lond.

Antimony, one part.

Nitre, three.

Deflagrate, and wash.

This is perfectly inert. The calx is quite white, and insoluble.

ANTIMONIUM DIAPHORETICUM NITRATUM. P. Edinb.

Antimony, one part.

Nitre, three.

Deflagrate, and reduce to powder.

This is evidently a mixture of a perfect calx of antimony, fixed alkali, vitriolated tartar,

tartar, and some nitre, owing to the superabundance of nitre used.

ANTIMONIUM DIAPHORETICUM LOTUM.
Edinb.

The same as the calx antimonii of the London Dispensatory.

NITRUM STIBIATUM. P. Edinb.

Made by crystallising the washings of diaphoretic antimony. The salt thus obtained is a mixture of fixed alkali, vitriolated tartar, and nitre.

Concerning many of the preceding operations, in which tartar and nitre are used, I reason thus. Tartar is a vegetable acid, convertible by fire into a fixed alkali, that is, nearly two thirds of the whole. Nitre is a neutral salt, composed of nitrous acid and fixed alkali: it is easily fusible, and capable of being alkalised by heat alone; that is, by heat sufficient to dissipate its acid. But the phlogiston remaining in the tartar accelerates the alkalisation of the nitre, because acids have with phlogiston a greater affinity than with alkali. The
acid,

acid, therefore, and phlogiston, unite and burn together, leaving the alkali to form a *bepar sulphuris*, which dissolves a proportion of the antimony employed.

TARTARUM EMETICUM. P. Lond.

*Crocus of antimony, washed,
Crystals of tartar, of each half a pound.
Water, three pints.*

Boil them for half an hour, filter and crystallise.

Crocus of antimony is the regulus deprived of about half its phlogiston. Tartar is a vegetable acid. This tartar emetic, therefore, is a semi-metallic salt; or an antimonial soluble tartar. Half an hour boiling is by no means sufficient.

TARTARUM EMETICUM. P. Edinb.

Cream of tartar, four ounces.

Glass of antimony, powdered, two ounces.

Boil them in two quarts of water, ten hours, adding more water occasionally; evaporate to dryness, or crystallise.

The glass of antimony is certainly preferable to the crocus, because it is more soluble;

soluble; but the proportions are egregiously wrong, if they meant to produce a neutral salt, which I suppose was their intention. The glass of antimony is more violent than the crocus; therefore this last preparation is stronger than that of the London Pharmacopœia. The glass ought to be porphorised, and the vessel, in which it is boiled, either glass or silver. In iron vessels it will be partly converted into a tartarised tincture of mars. Copper vessels ought, by all means, to be avoided. It ought certainly to crySTALLISE, though it will afterwards fall to a white powder.

Nevertheless tartar emetic, thus prepared, must be of different strength, according to the degree of calcination of the glass; and that precise degree, in which it is most, or least, emetic (which soever may be most desirable) cannot possibly be ascertained. Accordingly, I find on examination, that tartar emetic procured from different shops in this metropolis, differs inconceivably in the proportion of regulus it contains. In the Memoirs of the Academy of Sciences for the year 1754, we learn that Monsieur Geoffroy found the
different

different proportions of regulus in an ounce of tartar emetic to be from 30 grains to 154.

The author of a Chemical Dictionary lately published in France, proposes, in making tartar emetic, to substitute *mercurius vitæ* for glass of antimony. Now this *mercurius vitæ*, as it is ignorantly called, is an imperfect calx of antimony, calcined, not by fire, but by the muriatic acid. Surely it required much less chemistry than the author of that dictionary seems possessed of, to perceive, with half an eye, that the objections to the glass of antimony (and they are well founded) are equally applicable to this *mercurius vitæ*.

CAUSTICUM ANTIMONIALE. P. Lond.

Antimony, one pound.

Corrosive sublimate, two pounds.

Having powdered them separately, mix, and distill in a wide-necked retort, with a gentle sand-heat. What remains in the neck is the caustic required, called by the Edinburgh college, Butter of Antimony. What remains at the bottom is ordered to

*be sublimed, having changed the receiver,
by increasing the fire; and the result is*

CINNABARIS ANTIMONII. P. Lond. &
Edinb.

Crude antimony consists of regulus of antimony and common sulphur. The component parts of corrosive sublimate are mercury and spirit of salt. Now spirit of salt prefers regulus of antimony to mercury; therefore it sublimes in the butter, and the mercury is left to unite with the sulphur. This cinnabar therefore differs not in the least from that which is made with mercury and sulphur alone, or from native cinnabar. It is, in fact, an artificial ore of mercury, mineralised by sulphur. Probably it is entirely inert, being absolutely insoluble. In this instance, however, these two learned colleges keep each other in countenance.

REGULUS ANTIMONII MEDICINALIS.

Antimony, five ounces.

Sea salt, four.

Salt of tartar, one.

*Deflagrate, and separate the scoria from the
regulus.*

This

This regulus reduced to powder is a celebrated fever-powder in foreign dispensaries. Being thus deprived but of a small proportion of its sulphur, it is a mild, though uncertain preparation. The common salt is of no use, being unalterable in the fire.

VITRUM ANTIMONII. P. Edinb.

Calcine the antimony over a gentle fire to a grey calx, which melt in a crucible in a stronger heat.

If the heat be intense, it will succeed in about an hour; but it must be continued till, by dipping an iron rod, the matter will draw like glass, and is become transparent. The success of the operation depends chiefly on the calcination of the antimony. This glass is more soluble than the regulus. It is violently emetic.

VITRUM ANTIMONII CERATUM.

P. Edinb.

Yellow wax, one drachm.

Glass of antimony powdered, one ounce.

Melt them during half an hour, and, when cold, reduce them to a powder.

E 2 Here

Here the wax, by restoring some phlogiston, converts the glass into a kind of liver of antimony, milder than the glass; but its virus must necessarily be precarious.

KERMES MINERAL.

Antimony, sixteen ounces.

Fixed alkali, four.

Water, one quart.

Boil them two hours, and filter whilst hot.

As it cools, the kermes will precipitate.

Pour off the water, and add three ounces of fresh alkali, and a pint of water; in this boil the remaining antimony, as before; repeat this a third time, adding only two ounces of alkali; filter as before, and collect the powder, and wash it till the water has no taste; then burn upon it four ounces of spirit of wine; dry the powder, and keep it for use.

The author of The Elaboratory laid open says, this is the same as sulphur auratum antimonii. He is certainly mistaken. Kermes mineral was originally invented by Glauber. It was called Carthusian powder, because it was, for some time, prepared
only

only by a certain apothecary belonging to one of their convents. At length the Duke of Orleans purchased the secret of one La Legerie, a surgeon, who obtained it from a scholar of Glauber. It was called Kermes from its resemblance to certain excrescences of the scarlet oak, so called. Seventy-two grains of kermes contain about seventeen grains of regulus, fourteen of alkali, and forty of sulphur. After repeated washing, but little alkali remains, yet always some.

PANACEA ANTIMONII.

Antimony, six ounces.

Nitre, two.

Common salt, one and a half.

Charcoal, one.

Deflagrate in a crucible.

At the bottom is the regulus; in the middle, crocus or liver of antimony; and a spongy substance at top. The last of these is supposed to be the basis of Lockyer's pills. The addition of common salt is absurd, for reasons above mentioned. The charcoal does no more than accelerate the alkalisation of the nitre, the acid of which
has

has a greater affinity with phlogiston than with its alkali.

ANTIMONIUM CATHARTICUM.

Glass of antimony, four ounces.

Oil of vitriol, twelve.

Distill in a sand-heat; then wash the powder remaining in the retort, till the water becomes inspid; dry the powder, and grind it with Glauber's salt, and double the quantity of vitriolated nitre; fuse the whole one quarter of an hour; then reduce it to a fine powder, and wash.

Glauber's salt consists of vitriolic acid and fossile alkali; vitriolated nitre, of the same acid and vegetable alkali: ergo they are, in the crucible, one and the same neutral salt. But vitriolic acid calcines metallic substances by means of its affinity with phlogiston; therefore the glass is reduced to a calx. If it retained any thing of a saline quality, it would be dissolved in the washing. Now Glauber's salt cannot be decomposed but by phlogiston, except in very particular circumstances, which do not here occur. Hence there remains only a calx

calx of antimony, mixed with Glauber's salt, and, after the washing, the calx only, which perhaps, not being perfectly calcined by the vitriolic acid, may retain a part of its phlogiston. This was a notable invention of Wilson, who says it is a certain antimonial purge.

BEZOAR MINERAL.

Dissolve butter of antimony in nitrous acid, and evaporate to dryness, in a sand-heat. Add more nitrous acid, and evaporate as before; repeat the operation a third time.

Now butter of antimony is a solution of the regulus in the marine acid. On the addition of nitrous acid, an aqua regia is formed, which perfectly dissolves this semi-metal. But by repeating the operation, the muriatic acid is entirely expelled, and there remains a solution of antimony in spirit of nitre, which certainly might have been obtained by a much easier process. This bezoar however, after all, if the calcination be complete, is, like diaphoretic antimony, absolutely inert.

VINUM ANTIMONIALE. Pharm. Lond.

Crocus of antimony, washed, one ounce.

White wine, three pints.

Macerate without heat, and filter.

Here a small proportion of the regulus is dissolved by the vegetable acid in the wine; sufficient however to render the medicine violently emetic. But the college have not determined what wine should be used, nor the time of maceration. At any rate, wines differ so extremely in the quantity of acid they contain, that it must always be one of the least uniform of antimonial preparations.

VINUM EMETICUM. P. Edinb.

Crocus of metals, one ounce.

Spanish white wine, one pint.

Shake the bottle well; let it stand till the wine is clear, and then pour it off.

This differs very little from the last.

WARD'S PILL.

Glass of antimony, levigated to an impalpable powder, four ounces.

Dragon's blood, one ounce.

Sack

Sack or mountain wine, as much as is necessary to make into a mass for pills of a grain and a half each.

WARD'S DROP.

*Glass of antimony, powdered, half an ounce.
Malaga wine, sack, or mountain, one quart.
Let them stand two or three days.*

These are both much too violent for regular practice.

JAMES'S POWDER.

Take crude antimony, and calcine it with animal oil for two hours; then put it into nitre melted in a crucible, and let it continue there for some time; and afterwards take out the matter, and wash the salts from it, and dry it.

Take also quicksilver; distill it three times from crude antimony; then dissolve it in spirit of nitre; and having evaporated the fluid, calcine the dry mass in a crucible, till it turn yellow.

If we may believe the Doctor on his oath (and who shall doubt his veracity?) this is the famous powder that has so long continued

to perform such miracles. But if we consider the prescription independent of its author, we shall be apt to suppose it the invention of some ignorant old woman, literally transcribed from a receipt of her own writing. Calcining antimony with animal oil is amazingly absurd. In the first part of the operation, with or without animal oil, the antimony will be reduced to a grey calx; which being fused with nitre, and thus perfectly calcined, becomes a white calx of antimony, quite inert. But James's powder is not inert; therefore, either the calcination is incomplete, or continued so as to vitrify it in some degree; in which case it must be one of the most uncertain of all the antimonial preparations. With regard to the triple distillation of quicksilver from antimony, it were totally unnecessary, in this Society, to point out its absurdity, the result being evidently nothing more than the common red precipitate, imperfectly calcined. Upon the whole, we may venture to affirm, that, of all the antimonials which I have examined, this antimonio-mercurial is the
 most

most irrational and most improper for internal use.

Having thus examined all the preparations of antimony that are used in medicine, it seems necessary to take a short retrospective view of the whole. If we consider these several preparations attentively, we shall find, that, except emetic tartar, they are none of them soluble in water; but that acids of all kinds will dissolve any of them in some degree. Their operation therefore in the *primæ viæ* must necessarily depend on the acid they may meet with in the stomach and intestines: their effects therefore must be precarious; and whosoever has attended to the operation of these medicines, will find this observation verified by experience.

Tartar emetic is an antimonial salt, soluble in water, and therefore preferable to the rest; but, unfortunately for the prescriber, as well as the patient, we have seen, that it is even more variable, in point of strength, than any of those that are not soluble in water: the reason is obvious. But suppose it were even possible to obtain emetic tartar of a positive, determined, degree of

power, the smallness of the dose, as a febrifuge, is a dangerous inconveniency.

The grand desideratum then seems to be, a preparation of antimony, which shall be *perfectly soluble in water, invariably of the same strength, and the dose such, that the difference of a grain or two shall be attended with no danger or disappointment.*

I shall now proceed to lay before the Society the entire process by which I have produced the Febrifuge Powder, which now lies on the table.

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If the principles on which the process is founded be just (which does not even admit the shadow of a doubt) this powder, which is the result, must incontrovertibly possess the *qualities* above required.

And now, Gentlemen, having, to the best of my abilities, obeyed your commands, I must beg your indulgence one moment longer, whilst I make, what may possibly be thought, a very extraordinary and improper proposal. But how extraordinary soever, and improper, it may at first appear,

pear, probably a little sober reflexion may
 reconcile it to our delicacy. I humbly move
 then, that the process for making this
 powder be carefully concealed from the
 public. My reason for it is, that the
 public are not honest enough to be trusted
 with a medicine of such importance. I
 am sure I need not inform this Society,
 that almost all the chemical medicines
 we use are adulterated. Chemists, alas!
 are no honeste than their neighbours,
 though the articles in which they trade are
 of so much more consequence to society.
 In the process, which I have so circum-
 stantially described, you have seen, that
 not only the utmost attention, scrupulous
 honesty, and somewhat more than common
 knowledge of improved chemistry, are re-
 quired, but also genuine ingredients, and
 expensive utensils. These circumstances
 must indispensibly combine, or the me-
 dicine will be no better than many of the
 antimonials now in use. This being the
 case, suppose the process were made public,
 what probability is there, that you would
 ever meet with the powder in question, in
 any chemist's or apothecary's shop, pre-
 pared in the manner which I have de-
 scribed?

described? I will venture to affirm, you never would. Excuse me, Gentlemen, perhaps I am rather too warm in my manner of expression: but the subject appears to me of infinite importance to mankind. The medicine, I am convinced, will exceed your most sanguine expectations; but I am no less certain, that it can only be rendered universally useful, by deviating a little from scrupulous regularity in the mode of publication.

What I have to propose is briefly this. Let the medicine be prepared in your own laboratory, by your own servant, under the inspection of two of our members, from time to time appointed, in rotation, for that purpose. But that the medicine may not be confined to our own private practice, let some one creditable person in Edinburgh and London be appointed to vend the powder for the general use of the three kingdoms. —The proposal hurts you; I see it does: but there is no alternative. The evil, on the contrary side of the question, is infinitely greater. But, in order to avoid the appearance of a medicine imposed on the public for lucrative purposes, I have no objection
to

to your fixing the price so low, as merely to defray the expence of ingredients and preparations: or, if you think it more advisable to gain something to the Society, let the surplus be appropriated to any useful purpose, such as purchasing books towards forming a medical library. In short, be your determination what it may, my principal design in this matter is to furnish physicians in all countries with a safe, effectual, and uniform Febrifuge, which, I am confident, hath hitherto never existed.

Gentlemen, I have trespassed long, very long, on your patience; nevertheless, I must solicit your indulgence one moment longer, whilst I add a few words concerning the time and mode of exhibition of this Powder, which I have found by experience to answer best.

If the patient has an Inflammatory Fever, if the physician be sent for in the beginning, on the second or third day, he will necessarily bleed, in proportion to the age, strength, and symptoms of the patient. During this period, namely, to the third evening, or fourth morning, he ought to give no internal medicine whatsoever, except

cept diluting drinks, such as barley water, and clysters, if requisite. On the fourth morning, he must begin with a dose of the powder, and repeat it every four or six hours, according to the urgency and continuance of the symptoms.

But in Putrid or Malignant fevers, I find it best to begin with the powder as soon as the symptoms have determined the disease; that is, on the second or third evening, having previously bled the patient, if necessary.

I mention these particulars, because in your trial of this powder it is necessary we should all proceed upon the same general plan, lest our several reports to the Society should want that uniformity which alone must give the stamp of truth to the object of our enquiry.

I have prepared a sufficient quantity of the powder to furnish each member with as much as he will want, in order to try it in all diseases, where antimonials are indicated. The disorders, in which I myself have given this powder with astonishing success, are, (besides Acute Fevers) principally, Rheumatism of every species; Hypochon-
dri-

driacal complaints, generally owing to obstruction; and, in short, every disease, of which obstruction is the cause, especially the Jaundice, in the cure of which I have never once been disappointed. I have also found it not only an admirable medicine in the Natural Small Pox, but likewise the best preparative for Inoculation that can possibly be contrived.

There is another disease which has hitherto baffled the utmost efforts of physic, but which I have all the reason in the world to believe may be effectually cured by this powder, taken in small doses, and continued for some time: I mean the Gout. I have not made sufficient experiments to speak with certainty; I mention it therefore only as an object worth your attention. You will, in the course of your practice, have frequent opportunities of recommending it to your gouty patients; and I shall be glad to learn the result.

The dose which I have generally prescribed to adults in acute disorders, is one scruple; and the vehicle, a saline draught, or any simple aqueous liquor. If the

patient does not sweat at the time of exhibition, I often give the powder in half a pint of cold water, which I find to be a more immediate stimulus than any volatile or spirituous medicine whatsoever.

Read at the Society June 2, 1772.



Copied

Copied from the Minutes of the Society.

R*esolved*, That a Safe, Effectual, and Invariable Preparation of Antimony, is a valuable acquisition to physic; and that the Powder exhibited by ——— on the 2d of June, 1772, possesses these qualities in an eminent degree.

Ordered, That the two senior members do superintend the servant of the Society, as often as shall be necessary, during the chief process in preparing the powder according to ———'s directions, for the space of one month only, then to be relieved by the two next in succession.

That Mr. John Murray, bookseller, in Fleet Street, London, be, from time to time, supplied with the powder aforesaid from the Laboratory of this Society, and empowered to vend the same, under the name and title of the *Edinburgh Powder*; and, if any other person or persons what-

soever (except by appointment of the said Mr. Murray) do presume to vend the aforesaid powder, or any other medicine bearing the same title, that he, she, or they, be prosecuted as the law directs.

That, to prevent mistakes, the following Directions for the use of the Edinburgh Powder be printed and inclosed in each packet thereof.



DIRECTIONS FOR THE USE
OF THE
EDINBURGH POWDER.

FEVERS, *Inflammatory or Putrid.* After bleeding (if bleeding be indicated) give one paper every six hours in half a pint of water, a little, very little, warmed; but if the patient be weak, and his pulse low, though quick, let the water be quite cold. The best common drink in fevers, whether inflammatory or putrid, is whey made with vinegar, which, if no more vinegar be used than is necessary to turn the milk, is perfectly sweet and palatable: barley-water may be drank by way of change. If your patient be very bad, give him the first dose immediately after bleeding; but if the symptoms are moderate, defer it till the day after, and continue it every six hours till the danger is over. If from a natural irritability

irritability of stomach, the second dose should make the patient very sick, lessen the next, until he bear it easily. Each paper contains one scruple, or twenty grains, which is a proper dose for persons twenty years old or upwards; and, for those that are under that age, as many grains as they are years old; that is to say, five years old, five grains, or one quarter of a paper; ten years old, ten grains, or half a paper; and so of the rest. Follow these directions, and you will have few patients die of fevers. If there be any objections to common water, the powder may be conveniently taken in any simple water, or in whey.

PLEURISY and PERIPNEUMONY; that is, an inflammation of the membrane that lines the chest, with or without a violent pain in the side, often attended with a cough and great pain and difficulty in breathing.—Bleed; give a dose of the powder immediately after, and proceed, if necessary, as directed for fevers. If the pain in the side continue obstinate, clap a blister on the part.

SMALL POX, *Natural*. On the third evening after the patient sickens, give him as many grains as he is years old. As soon as the eruption is complete, repeat the dose; and again as soon as you perceive the pock has *turned*, as it is generally termed.

SMALL POX, *Inoculated*. Abstain from flesh meat and spirituous liquors for a fortnight before the operation; during which time, take three half-doses of the powder, with nearly equal intervals between each; that is, at the rate of one grain for every two years of the patient's age. If the arm inflame slowly, give another dose on the fourth day, otherwise not till the eruption is complete, and once again when the pock begins to decline.

MEASLES. As soon as the common symptoms of the measles appear, the patient should be bled in the morning, and at night take half a dose of the powder, according to his age, repeating it every second night till the fever is gone.

RHEUMATISM, *Inflammatory, Acute*. After bleeding, take one dose of the powder every six hours, diminishing the dose according

