A third dissertation on fever. : Part II. Containing an inquiry into the effects of the remedies, which have been employed with a view to carry off a regular continued fever, without leaving it to pursue its ordinary course / By George Fordyce, M.D. F.R.S.

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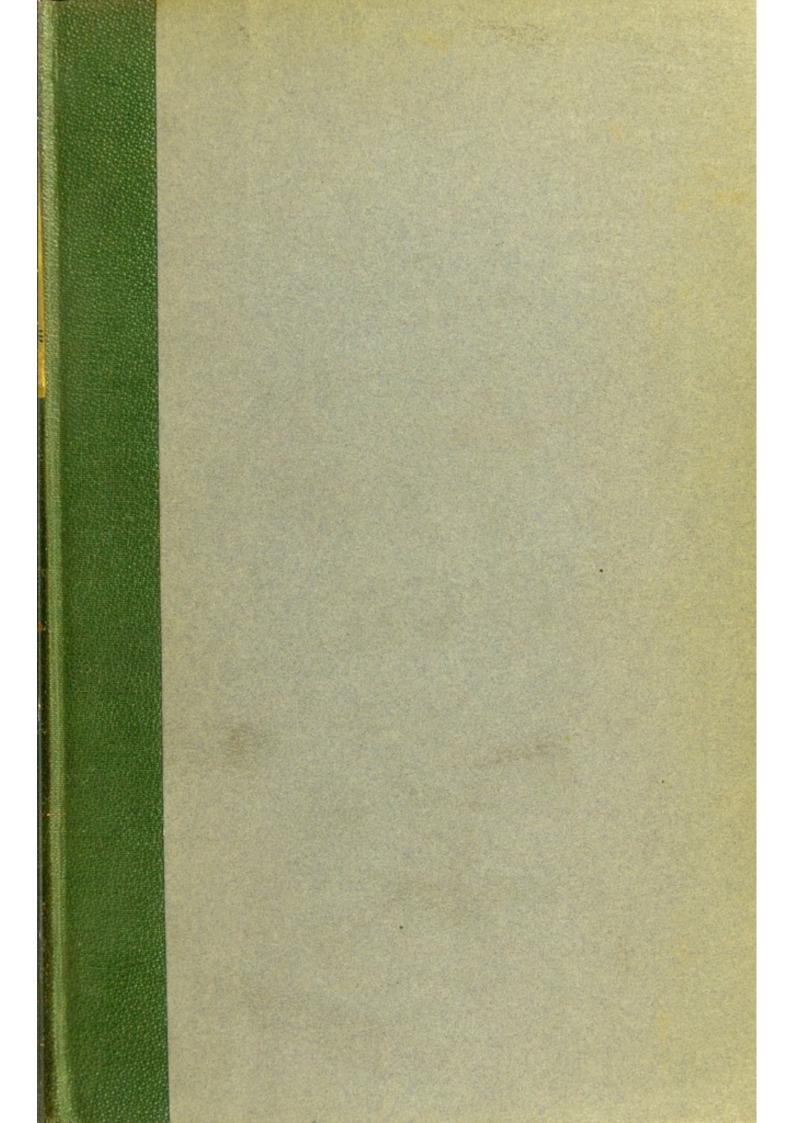London School of Hygiene and Tropical Medicine

A

THIRD DISSERTATION

ON

FEVER.

PART II.

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CONTAINING AN

INQUIRY INTO THE EFFECTS

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REMEDIES,

WHICH HAVE BEEN EMPLOYED WITH A VIEW TO CARRY OFF

A

REGULAR CONTINUED FEVER,

WITHOUT LEAVING IT TO PURSUE ITS ORDINARY
COURSE.

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Medicina igitur adhuc taliter comparata est, ut fuerit magis ostenta, quam elabora-
ta; etiam magis elaborata quam amplificata.

BACON AUG. Sc. Lib. ii. Cap. i.

Solent autem homines naturam tanquam ex præalta turri et e longo despicere, et
circa generalia nimium occupari; quando si descendere placuerit et ad particu-
laria accedere, resque ipsas attentius et diligentius inspicere, magis vera et utilis
fieret comprehensio.—IBID.

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Dr. FORDYCE's LECTURES commence
the first MONDAY in OCTOBER
and FEBRUARY.

A

THIRD DISSERTATION, &c.

PART SECOND.

HAVING, in the firſt part of this diſ-
fertation, pointed out the history of a re-
gular continued fever, the accidents that
take place in it, and the manner of avoiding
theſe accidents, if it ſhould be left to
purſue its ordinary courſe; excepting one
accident, to wit, putrefaction, which ariſes
but ſeldom; the author in the next place
is to take into conſideration the remedies by
which the fever may be carried off, ſo as to
leave the patient in health in a ſhorter time,
or to conduct him through with leſs danger,
than if the fever had been left to purſue its
ordinary courſe.

Since,

Since, as has been already obferved, the effence of fever, or the ftate in which the fyftem in fever differs from the healthy ftate, is altogether unknown, the effects of medicines in removing that ftate can only be known by obfervation or experiment ; there being no remedy that has any property, either chemical or mechanical, or any operation, when given to a man in health, that can point out any ground for employing it to carry off this difeafe.

The author now, therefore, comes to fhew what remedies have been employed by practitioners to carry off regular continued fevers, whether they have been employed in confequence of fome hypothefis, or have been found out by mere accident.

The firft remedy to be confidered is opening a vein in the arm, or indifcriminately in any other part of the body, and letting a quantity of blood flow out.

Authors and practitioners have confounded fever, fuch as the author has defined,

fined it, with many other difeafes, particularly with all fuch difeafes in which the pulfe is frequent to a certain degree.

Many difeafes, in which the pulfe is frequent to a certain degree, differ from one another in almoft every other refpect. The pulfe is frequent to upwards of an hundred ftrokes in a minute in a pleurify; it is often frequent to above an hundred ftrokes in a minute in gangrene and mortification; but pleurify, and gangrene, and mortification, are very different difeafes, and require treatments totally different from each other. In pleurify, taking away large quantities of blood is one of the moft powerful remedies for carrying off the difeafe; in gangrene and mortification, taking away large quantities of blood would be the moft effectual means of deftroying the patient. In gangrene and mortification, the beft mode of putting a ftop to the difeafe, is to exhibit the bark of the cinchona, in large quantities, with wine and fpices; in the pleurify, exhibiting large quantities of the bark of cinchona with wine and fpices would be

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the fureſt way of increaſing the pleuriſy, and rendering it fatal.

Certainly, therefore, diſeaſes in which the pulſe is frequent may differ from each other in all things, excepting mere frequency of the pulſe, which Dr. Boerhaave makes a ſpecific mark of fever. It is to be obſerved, that he had not at the time he gave this definition ever ſeen a fever, having ſtudied theology, and not medicine.

It has already been ſhewn that the pulſe in fever is by no means always frequent, and that therefore frequency of the pulſe can by no means be conſidered as a pathognomonic ſymptom of fever.

If all diſeaſes, in which the pulſe is frequent, be confounded together, and called fever, it certainly cannot be ſaid that taking away blood never cures the diſeaſe; but if the diſeaſe, which the author has endeavoured to define as fever, be only meant, the taking blood from a large vein, in any part of the body indiſcriminately, never diminiſhed,

nifhed, fhortened, nor carried off a fever in any cafe he has feen, nor has he found any upon record in which it had this effect.

It is true that an accident, fuch as general inflammation, may happen in an irregular fever, which may deftroy the patient, which accident may be counteracted and prevented from doing mifchief by taking blood from the arm, or any other part indifcriminately, as will be defcribed when fuch irregularity is treated of. The accident being removed, the fever may afterwards continue its courfe, may terminate by a crisis, or wear itfelf out, juft in the fame manner as if no fuch accident had taken place.

The author having affirmed that taking away blood from the arm, or from any large vein, neither increafes nor diminifhes a fever, nor alters its courfe, as far as he has feen, he next comes to confider what might be expected from taking away a quantity of blood indifcriminately from any blood-veffel during a fever.

B 3   A quantity

A quantity of blood flowing out of the body, whether it be taken on purpofe, or by any accident, occafions weaknefs. If the blood continues to flow, the weaknefs will encreafe fo as to render the body incapable of performing any function or action whatever, and in confequence to kill. If it does not continue to flow, it weakens a man, and the weaknefs continues until the blood is reproduced by the digeftion of food of proper nourifhment, or perhaps by the converfion of expreffed oil, or other fubftances depofited in the body, into new blood. This weaknefs, with the accidents that arife from it, are the only effects of the lofs of blood, which are perceivable.

As fever takes place equally in a ftrong and a weak man, it is alfo equally violent, as far as regards the fever itfelf, in a weak man as in a ftrong man, and it is apter, or at leaft as apt to run out to a great length in a weak man, as in a ftrong man.

It is not, therefore, *a priori*, at all probable, that weakening a man fhould diminifh or fhorten a fever.

It

It comes then to be enquired into, why taking away blood indifcriminately from any large vein has been fo often practifed in fevers, even by practitioners of the firft rank in medicine?

The author can only refer this practice to the impatience with which mankind bear any evil, and that fuperftition which predominates in them. If any violent difeafe takes place, men immediately recur to fome violent remedy. Their recurring through impatience to fome very violent remedy is no proof, that fuch remedy is ufeful to give them relief from the malady. If a man who has gone upon a journey fhould return, and without previous notice find his houfe burnt down, his whole family and property deftroyed, and all his friends ruined, he would be apt to ftamp upon the ground, beat his breaft and tear his hair; but ftamping upon the ground would not rebuild his houfe, nor would beating his breaft reftore his family and property, nor tearing his hair retrieve his friends. It is mere impatience that makes

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him

him have recourfe to thefe violences, fo mere impatience makes mankind have re-courfe to violent remedies in difeafes, al-though no experience has fhewn that they are of any ufe in the difeafe for which they have been employed. To this argument the au-thor will have occafion to recur, when he comes to treat of irregular intermittents in a future differtation.

So in like manner it is often from fuper-ftition that fuch violent remedies, and efpe-cially blood-letting, have been employed.

Mankind are exceedingly apt to believe, that refraining from fome gratification is agreeable to the Almighty, or the gods their imaginations have created ; even if they enjoy that gratification, without any injury to their own health or conftitu-tion, or without injury to their fellow crea-tures, or any animal whatever, or without hurt to their moral character.

Some pretended teachers of religion have even gone fo far as to refufe to their difci-

ples,

ples, dying of fo diftreffing a difeafe as pulmonary confumption, the gratification of enjoying the cheerful warmth of the funfhine.

Under this, or fome very fimilar idea, men have thought that their gods would be content with one part of the body to fave the whole. Hence we fee among many rude nations, that a finger or toe is cut off, or a tooth or two knocked out, in order that the reft of the body may be left fafe.

Blood, by its intenfe red colour, has attracted the attention of mankind. It has alfo attracted their attention becaufe the lofs of it, as has already been faid, in a certain quantity, is fatal; the lofing, therefore, a quantity of blood, has become the object of their fuperftition. Lofing blood has been looked upon as the greateft oblation that could be made in the moft folemn ceremonies; as the mark of the greateft bond of fecrecy and fteadinefs, men have figned contracts with their blood. Taking away, therefore, a quantity of blood has

been

been thought a facrifice the moft powerful for carrying off a difeafe, and for carrying off fever as one of the moft violent and fatal of difeafes.

The author does not mean to fay that every practitioner, who bleeds conftantly at the beginning of a regular continued fever, has this idea in his mind. The greateft number of practitioners follow the practice of thofe who went before them, without examining from whence that practice has arifen, or upon what ground it is founded.

From this view of the fubject it may, perhaps appear why blood-letting has come into practice in the beginning of all regular continued fevers.

Practitioners alfo have not compared cafes of fevers in which it has been prac-tifed, and of fevers treated otherwife in the fame manner in which it has not been prac-tifed.

The author has faid, that taking away a quantity of blood from any large vein in-difcriminately,

difcriminately, in any part of the body, neither increafes, diminifhes, nor fhortens a regular continued fever. The next enquiry is, whether any mifchief may arife in a regular continued fever from taking away a quantity of blood.

The author has already fhewn that a patient afflicted with regular continued fever cannot digeft his ordinary quantity of food; therefore the fluids which are conftantly wafting cannot be recruited, and that the fyftem muft be weakened.

That in a regular continued fever there are conftant exertions which likewife debilitate.

That the reft which takes place in fleep is neceffary to reftore the living power, but fleep being prevented in fever it is not recruited.

That in confequence of all thefe caufes of weaknefs, the patient is actually fo debilitated as to be deftroyed in many inftances.

ftances. The further debility arifing from emptying the veffels by taking away a quantity of blood, is often fuch as to deftroy the patient in the remaining part of the difeafe. Patients in confequence have very often been cut off, when blood has been taken indifcriminately from any large vein at the beginning of the difeafe, as the author has feen in a great many cafes. In the firft part of the author's practice, the Boerhaavian doctrine prevailed ; this induced practitioners to take blood from the patient in all cafes of fever, fo that the author has had occafion frequently to fee the effects of this practice.

The author having faid that the effence of the difeafe not being at all known, it cannot be faid, *a priori*, whether any particular remedy will be of ufe in fhortening or entirely carrying off fever.

Taking away blood from the veffels of the head has, in fome cafes, immediately carried off fever ; it has alfo tended to diminifh delirium accompanied with fulnefs

of

of the veffels of the head, even when it does not fhorten the difeafe.

The firft of thefe effects will be confidered in a differtation on the irregularities of fever, and the fecond in a future part of this differtation.

Many practitioners have fuppofed that fever arifes from fome peculiar kind of matter that has got into the body; that fever is an effort produced in the body to induce fome operation by which fuch matter might be deftroyed. Sydenham judicioufly fuppofes, that a fermentation takes place which alters the qualities of the matter, or converts it into another fpecies of matter which has not the property of producing or keeping up this difeafe.

If it were really true that any particular fpecies of matter produced and kept up a fever, it would follow that until fuch matter was deftroyed by a fermentation, or fome other procefs that might take place in the body, or was evacuated, the fever would continue.

continue. In that cafe, it would become a queftion whether fome other means than that which takes place in the body of itfelf, might be employed to take this matter out of the body, or deftroy it, fo that it might no longer keep up the difeafe.

Some practitioners have fuppofed that this might be done by evacuation.

If a blood-veffel is opened, the whole circulating fluids are equally evacuated, every one, good or bad, noxious or innoxious, thofe that are commonly in the body, and thofe that are there only by accident; no particular matter would be taken out more than another, and therefore it is not to be fuppofed that the matter occafioning a fever would be removed by making this evacuation.

If the fubftances evacuated out of the body by the various excretions be examined flightly, they appear to be more different than when they are examined more minutely, but ftill upon minute examination they differ very much.

It

It might happen that some secretory organ is disposed to throw some particular noxious matter out of the system, and that therefore, by increasing some secretion, (since an encrease of any secretion, to a certain degree, occasions the secreted matter to be thrown out of the body) might make the matter producing and keeping up fever be evacuated, so that the fever should cease. But it may also happen on the other hand, as has already been taken notice of, that a fever may arise without any noxious matter being applied to any part of the body, or generated in the body; and in this case there being no noxious matter to evacuate, neither the operation of purgatives, or any other evacuant would carry off the matter, and so remove the disease.

It has also been shewn that noxious matter does sometimes produce fever when applied to the body, and that after the fever is produced, it is really contained in the body, as in the case of fever arising from the application of variolous matter; but then it has been shewn, that in such cases the noxious

matter produces the difeafe at once, and what is contained in the fyftem after the fever had taken place, has no effect upon the difeafe; it neither increafes it, nor does its abfence diminifh it, and the fever often goes off when there is the largeft quantity of noxious matter in the body. In fuch cafes it would not furely be conceived, if we could evacuate fuch matter, that the difeafe would be carried off; in fuch cafes, therefore purgatives would be of no ufe.

Hitherto the argument has been purfued *a priori*; but neither the effence of fever, nor the operations of the human body, are fufficiently known, as the author has before obferved, to determine the efficacy of any medicine to carry off fever; experience muft therefore be had recourfe to, to determine whether purgatives or any other medicine producing evacuation from any gland may be employed to carry off the difeafe.

If the matter be referred to the experience of the moft judicious authors, all thofe who have conceived fever to depend upon

<div align="right">matter</div>

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matter of a peculiar kind contained in the fyftem, have agreed that it muft be con-cocted before it can be evacuated ; that is, that it muft undergo fome procefs before it is prepared for evacuation ; otherwife that evacuation, by purging, or increafed fecre-tion from any of the glands, will have no effect in carrying off the difeafe. They are agreed at leaft that evacuation before concoc-tion muft only be made at the beginning of the difeafe to be efficacious ; after the difeafe has continued a day or two, they have no more expectation that evacuating the matter will carry off the difeafe. The author, there-fore, would be warranted by authority to fay, that evacuation by purging, or any other increafed fecretion from glands, would have no power of carrying off fever, ex-cepting the evacuant fhould be employed in the firft twenty-four hours ; or at the end of the difeafe, after the matter is concocted, or has undergone fuch an alteration as to render it fit for evacuation.

It is further to be obferved, that when any matter is applied to the body, fo

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as to produce fever, not immediately, but at the interval of feveral days, fuch as the matter of the fmall pox, or the meafles, or putrid or infectious vapour; if purgatives are employed during the interval between the application of fuch matter, and the taking place of the firft paroxyfm of fever, the fever has never been prevented from taking place in any cafe which the author has feen; or in any cafe which has been recorded with almoft any evidence. This is equally to be obferved in thofe cafes in which the application of the caufe has produced fome immediate appearance of the firft ftage of fever without producing a perfect paroxyfm; when thefe appearances have continued until a complete paroxyfm has taken place.

In thofe cafes where the application of the matter to the body, which occafioned the fever, produced no appearance of the difeafe on its application, but the patient felt himfelf in perfect health until the complete attack of the fever came on, neither purgatives nor any other medicine increafing fecretion, have prevented the difeafe.

If

If the evacuation by purging or increafed fecretion from any of the glands, does not carry off the matter from the body before it has produced the difeafe, there feems to be little reafon to hope that fuch evacuation will carry off the matter occafioning the fever, and the fever itfelf after it has actually taken place.

The author has already obferved, that feculent matters remaining in the inteftines, which they are apt to do when a fever takes place, tend to increafe the difeafe. Though their removal prevents the mifchief they would produce, yet, as far as the author has been enabled to judge from the attention he has paid to fuch cafes, their evacuation has in no cafe done more than merely obviate the mifchief which would have taken place in confequence of their retention. Such evacuation has never, in any degree, removed the fever, or prevented it from purfuing its ordinary courfe.

Thofe practitioners who have believed that fever depends upon fome noxious mat-

ter

ter contained in the body ; that that noxious matter is concocted ; that is, goes through fome operation by which it is prepared for evacuation, have alfo fuppofed that when a crifis took place, the matter was evacuated after it is concocted, and that fo the fever was carried off. They have thought that if it was not completely evacuated, it is neceffary to employ purgatives to evacuate what might remain of the matter in the body, and re-produce the difeafe. They have alfo thought that when no marked crifis took place in the difeafe, but it gradually fubfided, that it fubfided more flowly on account of the noxious matter not being all at once evacuated, and therefore have employed purgatives to make it be evacuated more fpeedily, fo that the difeafe fhould fooner fubfide.

The author, from his own practice, is obliged to be of a contrary opinion, fince he has feen relapfes much more frequently take place when purgatives have been employed after a marked crifis, or after the difeafe has gradually fubfided, than when purgatives have not been employed.

Upon

Upon the whole, then, the author believes it to be perfectly neceſſary at all times, during the progreſs of a regular continued fever, to keep the inteſtinal canal free of feculent matter; yet that making further evacuation by purging or increaſing the ſecretion from any of the glands, ſo as to occaſion evacuation, is of no uſe in carrying off the fever, but rather tends to prevent the fever from being carried off, and, if it is carried off, to produce relapſes.

Moreover the author has already ſhewn, that it required the whole force of the ſyſtem to ſupport the patient through the ordinary courſe of a regular continued fever. He has alſo ſhewn that the force of the ſyſtem is reduced by evacuation; he muſt therefore conclude, that ſimple evacuation by purging, excepting in as far as it is neceſſary to keep the *primæ viæ* clear of feculent matter, is detrimental inſtead of being uſeful; and that ſimple evacuation from any of the glands, as tending alſo to weaken, is detrimental inſtead of being uſeful.

It

It does not appear with any degree of certainty that antimony, a medicine which has been employed to carry off fever within this century or two, was at all known to the Greek philofophers, phyficians, or artifts.

There was a fubftance which they named ftibium, which was employed to give a blacknefs to the eyes, but the effects which were produced from it either among the Greeks and Romans, or among the modern inhabitants of Afia, fhew that this fub-ftance was more probably a kind of lead ore than an ore of antimony.

Antimony, or as it is more commonly called crude antimony, is the ore of a metal which exifts in many parts of the earth. It is a compound of fulphur and a metal, in which the fulphur bears a much greater proportion to the metal than can be com-bined with it chemically. More properly, it is a compound of fulphur and the metal, diffufed through a fuperfluous quantity of fulphur, fo that part of the fulphur retains

fome

fome of its properties, which it has when not combined with the metal. The fulphur fo covers the metal or is fo combined with it, as to prevent it from producing its medicinal effects. This ore of the metal is folid in the heat of the atmofphere. It requires a little lefs than that degree of heat which renders fubftances luminous to melt it, fomewhere probably between five and fix hundred degrees of Fahrenheit's thermometer. Its melting point has not been exactly afcertained in as far as the author knows. It is of a dark blue colour, and is generally found in a kind of cryftalization, fometimes in complete cryftals, which are prifms terminated by pyramids at one end, and at the other generally attached to each other; otherwife is a mafs without form. More commonly thefe cryftals are united together fo as to form a ftriated mafs, efpecially when they are unmixed with any other fubftance.

The metal has lately been found alfo combined with fome fubftance, fo as to

C 4   form

form the fame kind of cryſtals or ſtriated
maſs, only of a dark red colour, ſhining,
however, with metallic luſtre. It has been
conjectured, rather than confirmed by ex-
periment, that theſe cryſtals or this ſtriated
ore contain arſenic, beſides ſulphur and the
metal of antimony. This conjecture is
rendered probable, becauſe this red ore of
antimony has been almoſt always found
with regulus of arſenic; that is, the metal
of arſenic pure; and therefore experi-
ments made to verify the exiſtence of ar-
ſenic in this red ore, ſhould be made in
ſuch parts of it as are perfectly clear from
the particles of the metal of the arſenic in
which it is found.

The metal has alſo been found but very
rarely, certainly however ſometimes un-
combined with any other ſubſtance, but ſo
rarely hitherto as not to be employed for
any medicinal purpoſe.

Upon the whole, all the antimony which
has been employed in medicine has been
procured

procured from that ore of antimony, confifting of antimony and fulphur.

This ore, when dug from the mine, is laid upon an inclined plane, formed from a mixture of clay and fand burnt in the fire. The inclined plane is heated red hot ; the ore of the antimony being laid upon it melts, and runs off from the other fub-ftances with which it is mixed, and is received into a large and deep earthen veffel, in which, when it has ftood to cool, it concretes into a folid mafs.

If this folid mafs concretes fo as when broken to exhibit long ftriated fhining fpi-culæ, it is a pure compound of antimony and fulphur, and fit to be employed for me-dicinal purpofes.

A vaft number of chemical proceffes have been employed to give antimony medicinal effects ; more than two or three thoufand. Of the product of all thefe there are only three preparations at prefent much in ufe.

One

One is made by boiling the antimonial ore
or crude antimony in a folution of pure or
prepared kali in water. The decoction,
after it has been ftrained, is diluted with a
confiderable quantity of water, at leaft ten
times its weight. The diluted folution is
placed in a fhallow veffel, the furface ex-
pofed to the air, until a powder falls to
the bottom of the veffel, which, taken out
and dried, is called kermes mineral.

The fecond procefs is performed by mix-
ing the ore of antimony or crude antimony,
finely powdered, with an equal weight of
the fhavings of the horn of any animal.
This mixture is to be put into an iron pot,
which is to be heated red hot, and the mix-
ture is to be ftirred, the pot being kept red
hot, until it ceafes to fmoke. The mixture is
afterwards to be allowed to ftand until it cools.
It is then to be put into a crucible, which
is to be covered with another crucible,
whofe mouth is to be turned down into that
crucible which contains the materials. The
crucibles with the materials are expofed to a
white heat for two hours; part of the mat-

ter

ter remains of a white colour in the under crucible, which is to be ufed ; part fublimes into the upper crucible, which is to be thrown away.

The third preparation is made by combining the metal of antimony with tartar, an acid produced in the fermentation of various wines, which is found adhering to the fides of the veffels in which the wine has ftood for a year or more after the active fermentation has ceafed.

When two fubftances, which unite with one another only in one proportion, are combined together chemically, and the compound purified, the fubftance is undoubtedly the fame in all its properties. It happens, neverthelefs, with refpect to the chemical combination of two fubftances which unite with each other in one proportion only, that when they are combined together by different proceffes, there are often different imperfections in the combination or fome want of purity in the compound. This, though not fenfible to any chemical teft,

teft, makes a very confiderable difference in
their actions as medicines. In the prefent in-
ftance of the compound of tartar and the metal
of antimony, or, perhaps, if ftrict adhe-
rence was to be had to chemical accuracy, we
fhould fay compound of tartar and calx of
antimony, this difference is confpicuous.
Of the feveral methods of forming this
compound, the following is the beft for me-
dicinal purpofes : Take an equal weight of
the ore of antimony feparated from extra-
neous fubftances by fufion, as has been
above defcribed, and of kali nitratum.
Powder them together, and throw the mix-
ture into a crucible, heated fo as to be juft
luminous, by very fmall portions, about
twenty grains at a time, until a deflagration
takes place ; wait till the deflagration is
over ; throw in a little more of the mixture ;
wait again till the deflagration is over.
Proceed in this manner until the whole
is deflagrated. Cover the crucible, and
expofe it to an heat juft fufficient to melt
the whole mafs. Pour the melted mafs
into an iron veffel of a conical form, the
point of the cone being downwards ; the
<div align="right">whole</div>

whole will be found, when it is cold and folid, divided into two fubftances, one of a reddifh brown colour and heavier, which has fallen to the bottom; the other, of a grey colour, which is found at the top, and is fpecifically lighter. The heavier part, which is found at the bottom, is a compound of fulphur and the metallic part of the antimony. A portion of the fulphur which was united with the antimony in its ore, more than was neceffary to combine with the metal of the antimony, is converted into vitriolic acid by uniting with the air of the nitrous acid. This vitriolic acid is found in the upper greyifh mafs, combined with the kali of the kali nitratum, and forms kali vitriolatum.

The antimonium fulphuratum, found at the bottom, is to be powdered and mixed with one third more than its weight of purified tartar, and boiled in fix times its weight of water for a quarter of an hour; the folution is to be filtrated and the water evaporated, and the compound of the tartar and the metal of the antimony cryftallized.

This

This falt for chemical purpofes may be purified, by diffolving it again in water and re-cryftallizing it ; but it is a queftion whether it would not lofe fome portion of its medical powers by this purification.

The metal of the antimony may be feparated from the fulphur with which it is found combined in its ore, by mixing the ore with five times its weight of kali preparatum ; that is, with kali combined with gas, which gas has been called alfo fixed air and carbonic acid. The mixture of the kali preparatum and ore of the antimony is to be melted together by a heat juft fufficient to render them perfectly fluid. The crucible being taken from the fire is to be left till it is quite cold ; on breaking it, the metal of the antimony will be found at the bottom, and the compound of kali and fulphur at the top.

This is not the moft economical mode of obtaining the metal of antimony ; but provided we take the ore feparated from the other fubftances with which it is found
mixed

mixed in the mine, as has above been de-
fcribed, the metal by this procefs is obtain-
ed the pureft for medicinal purpofes.

If the metal thus obtained is powdered
finely, and boiled with pure tartar in
water, a compound of the tartar and anti-
mony will be obtained, which, if purified
by re-cryftallization, will be exactly the fame
with that obtained by the procefs above de-
fcribed, in all its chemical properties.

Another mode of obtaining this com-
pound is—Take the ore of antimony puri-
fied, as has been already defcribed, powder
it, and put the powder into a flat veffel;
heat it till it begins to fmoke; keep up the
heat, but take care not to render it fo great
as to melt the mafs, until it no longer fmokes
in any heat not fufficient to melt it. The
remaining mafs, which is the metal of an-
timony calcined (probably combined with
pure air) if expofed to a greater degree of
heat, will melt into a glafs. If this glafs
be powdered, and boiled with pure tartar in
water, a compound of antimony and tartar
will alfo be procured; this purified by re-

peated

peated folutions in water and cryftallization will, in all its chemical properties, be the fame as when the falt is procured by the two proceffes already defcribed, but if not cryftallized a fecond time, will not agree exactly in its medicinal effects.

The metal of antimony may be combined with muriatic acid, by feveral proceffes. One of thefe, for inftance, is. Mix the ore of antimony with that compound of muriatic acid and mercury which has been called corrofive fublimate. Perform a diftillation, or rather a fublimation, and expofe the matter fublimed to the air of the atmofphere, until it has attracted water enough to render it fluid ; pour this folution of antinium muriatum in water, or any other made by this or any other procefs in which the water is faturated with the antimonium muriatum, into eight or ten times its weight of diftilled water. A calx of antimony will fall down in a white powder, which has been called powder of algorath ; this being boiled with pure tartar in water will combine with it, and form antimonium tartarifatum,

which,

which, if purified by re-cryftallization, will be the fame to all chemical and medical purpofes as the antimonium tartarifatum produced by the three foregoing proceffes, but not exactly in its medical effects unlefs purified by recryftallization.

Although the antimonium tartarifatum obtained by any of thefe proceffes, when pu-rified by re-diffolution in water and re-cryf-tallization, may perhaps be the fame for me-dicinal as well as chemical purpofes, which however has not been proved by experiment, yet when it has only fimply been formed by thefe four different proceffes, without re-diffolution in water and re-cryftallization, there is a difference in its operations as a medicine.

When the London College of Phyficians reviewed their pharmacopeia for its refor-mation and republication in the year 1786, it became a queftion which of the four pro-ceffes they fhould adopt.

Whenever any queftion of a chemical or pharmaceutical kind occurred, it

was

was referred to a committee confifting of fome members of the College and the Company of Apothecaries, and the proceffes were actually performed in the laboratory of the Company of Apothecaries, that fo the beft mode of performing the operation might be verified by experiment.

A queftion having arifen with regard to tartarifed antimony, it was prepared by all thefe proceffes.

The tartarifed antimony produced by thefe proceffes was given to the Phyficians of St. Bartholomew's and St. Thomas's Hofpitals. In St. Thomas's Hofpital they were given to more than an hundred patients, fo as to give each of them to one and the fame patient in fmall dofes.

The tartarifed antimony prepared with the crocus metallorum and tartar was found to be capable of being exhibited in a larger dofe than any of the others without producing ficknefs, and to act more powerfully as a fudorific, and therefore was preferred, whe-

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ther properly or not, will be argued afterwards.

At the time the science of medicine was revived with the other sciences first in Italy, there does not seem to have been any medicine recommended to put an end to fever immediately by Galen or Celsus, or any of the Greek or Roman writers upon the subject, excepting cold water drunk in a large quanties at once. It was not supposed that a fever might otherwise be cured immediately so as to prevent any future appearance of the disease, either by preventing the returns of the paroxysms, or carrying off the disease instantaneously, or by producing an immediate crisis. The doctrine then was to attend to the disease while it pursued its ordinary course, only taking care of the accidents which might happen during that course, that is, taking fever according to that idea of it which the author has been endeavouring to lay down.

There arose in Europe some time afterwards a number of alchemists who made

many

many proceffes with a view to convert metals into gold. Having formed many fubftances by proceffes which did not make gold, but which produced many things which they were not able to turn to any profit, they tried to apply them to the cure of difeafes. All fuch chemifts muft be confidered as empiricks, and the greater part of the fubftances which they produced were in fact of no ufe. Antimony, however, gained a reputation for carrying off fome difeafes without their going through their ordinary courfe if otherwife left to themfelves; it is probable it was employed for this purpofe in fever as foon as the time of Van Helmont.

Thefe chemifts did not ftudy medicine, nor did they diftinguifh difeafes, but only aimed at making fome profit of the refult of their proceffes. They called every difeafe fever in which there was great fenfe of heat in the patient, and greater frequency of the pulfe than in health, fo that they not only employed preparations of antimony in fever, but in internal inflammations and various other difeafes.

Practitioners,

Practitioners, who were educated in the regular practice of medicine, studied principally the writings of the ancient Greek and Roman Physicians. These used for the most part vegetable substances for remedies in diseases; the modern practitioners, therefore, reprobated all the substances which were the result of chemical operations; they considered them only as the boast of ignorant empiricks. This opinion went so far, that even so late as the time of Boerhaave, mercury was rejected by regular practitioners in the venereal disease.

Some practitioners, as there always will be men who balance between two different doctrines, employed indeed preparations of antimony, but such as had little or no effect; such as antimony calcined, by deflagrating it with three times its weight of nitre, and various others equally inefficacious. They of course did not find any advantage arise from preparations of antimony; they therefore reprobated the use of all antimonial medicines in fever. Hence it happened that they were not much employed before the time of the late Dr. James with efficacy

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in Great Britain : he was a Phyfician of re-
gular education, having ftudied at the Uni-
verfity of Cambridge, but was confidered
in fome degree as an empiric in confequence
of employing fome preparation of anti-
mony, which he kept a fecret.

The preparation he made ufe of confifted
principally of antimony calcined, by mix-
ing it with fhavings of harts-horn, and ex-
pofing the whole to a great degree of heat.
Upon analyfing it, which was done long
before his death, it was found to confift of
a calx of antimony, mixed with bone
afhes. It is extremely probable, that he
mixed along with it a proportion of tartar-
ifed antimony; the author knows that he
purchafed confiderable quantities of tartar-
ifed antimony, two pounds at a time, from
an eminent druggift. This might eafily
efcape the fcrutiny of a chemical analyfis,
fince the quantity contained in one dofe did
not certainly exceed a quarter of a grain.
From the very eafy decompofition of tar-
tarifed antimony, when diffolved in a large
proportion of water, fo fmall a quantity
might not be obferved.

Dr.

Dr. Cullen was the firſt eminent teacher of medicine who recommended the uſe of preparations of antimony to carry off fevers directly. As moſt of the principal practitioners of the preſent day, in this iſland of Great Britain, have been pupils of Dr. Cullen, its uſe has lately very much prevailed. If this had not been the caſe, it would have been a queſtion whether it would not have funk into oblivion, like any other empiric remedy whoſe preparation was kept ſecret.

Dr. Cullen conceived, that the effect of preparations of antimony aroſe from their producing ſickneſs. Tartariſed antimony is much more certain of producing ſickneſs, than any other preparation that was known to him; it was therefore preferred by him, and of courſe that preparation of antimony which produced ſickneſs in the ſmalleſt doſe he conſidered as beſt.

The author is of a different opinion; to wit, that it is not the ſickneſs produced by the preparations of antimony, that has the

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effect of carrying off fever immediately, but fome other operation of the medicine.

First, becaufe there are many other remedies which produce ficknefs to as great a degree as any preparation of antimony; yet thefe have no power whatever of making fever terminate fooner than it would if it was left to purfue its own courfe. The root of the fquill, for inftance, often produces ficknefs to a much more fevere degree than any preparation of antimony, yet it has never been alleged, that it has the power of carrying off fever fooner than it would go off, fuppofing that it was allowed to purfue its ordinary progrefs. Moreover, the author has frequently exhibited the root of the fquill as an emetic, and likewife in fuch dofes as to produce naufea without vomiting; alfo in fuch dofes as juft not to produce naufea, without ever producing any thing fimilar to the appearances which take place in a crifis of fever, or without ever once occafioning a fever to terminate fooner than it would have done if left to purfue its own courfe. In fo far, therefore, the author muft conclude, that the ficknefs oc-

cafioned

cafioned by the exhibition of a preparation of antimony is not the caufe of its carrying off fever.

Secondly, the ftomachs of different men, though they are otherwife in the fame fitua-tion, are affected differently by the fame quantity of any particular medicine: the ftomach of different perfons, or of the fame perfon at a different time, being able to bear a larger dofe without its producing ficknefs or vomiting.

Almoft every medicine given in a certain dofe will produce ficknefs and vomiting; even opium, if given in a certain dofe, that is, to the quantity of two or three grains, will fometimes produce ficknefs and vomit-ing, and fometimes purging.

When a medicine is given in fuch a dofe as to produce vomiting, it often lofes its pe-culiar effect. The bark of the cinchona, when given in fuch a dofe as to produce vo-miting, either from the difpofition of the fto-mach of the patient not to bear fo large a quantity as the ftomachs of men will gene-rally bear, or from its being exhibited in a

larger

larger dofe than common, will often fail in putting a ftop to the progrefs of an intermittent fever. It may be faid indeed, firft, that the peruvian bark, by producing ficknefs and vomiting, will be thrown out of the ftomach before it has time to be abforbed and carried into the blood-veffels. But the author has fhewn in his Differtation on a regular tertian, that it does not put a ftop to the progrefs of an intermittent fever by being carried into the inteftines and abforbed, but by the impreffion it makes on the ftomach and inteftines. In the fecond place, it may be faid that the bark of the cinchona, by producing vomiting, is prevented from remaining a fufficient time in the ftomach to make its impreffion there; but the author has alfo fhewn in the fame Differtation, that the bark of the cinchona exhibited half an hour before the beginning of a paroxyfm of a tertian intermittent, often makes fufficient impreffion to prevent the paroxyfm from taking place. It is often more than half an hour after the exhibition of a dofe of the bark of the cinchona before it occafions vomiting; but when it does occafion vomit-

ing,

ing, it often does not prevent the return of the difeafe.

In like manner, ceruffa acetata given in a fmall dofe does not produce either vomiting or purging, but on the contrary a diminution of the periftaltic motion of the inteftines, and not uncommonly a paralytic affection of them, and likewife of the extremities; yet when it has been by accident taken in a confiderable dofe, to the quantity of a dram or two, as the author has feen in feveral cafes happen, it has produced both vomiting and purging, but no paralytic affection of the inteftines, or any other part of the body, has enfued.

The author therefore conceives, that when any remedy produces vomiting, it very often lofes by this effect its other operations on the fyftem, and that preparations of antimony, in like manner, if they produce vomiting, or even ficknefs, though no vomiting fhould enfue, lofe their effect in carrying off fever.

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The author conceives, that every medicine given in too great a dose acts as a simple stimulant on the part to which it is applied, and loses its peculiar effects both on that part, and on the system generally. Thus a moderate quantity of wine makes the stomach digest the food more readily than it otherwise would have done, but a large quantity of wine prevents digestion from taking place at all. A moderate quantity of spice gives a feel of warmth over the whole system, a large quantity of the same spice produces pain in the stomach and coldness over the whole system, and frequently sickness and vomiting. It would be too great a digression to enter fully on the maximum of the doses of medicine; if the author should live to finish these Dissertations, it is a subject that he means to pursue.

In the third place, the author has observed, when tartarised antimony has been exhibited in fevers, that when the patient's stomach could not bear a quarter of a grain of it prepared as has been said, without producing sickness, it has happened rarely
that

that it has produced any thing like a crifis, or in any way diminifhed or carried off the difeafe. On the contrary, when the ftomach would bear more than a quarter of a grain of tartarifed antimony, prepared in the fame way, and by the very fame individual procefs, without producing any naufea, it has very often produced critical fymptoms, or a complete crifis, fo as to carry off the difeafe. For thefe reafons, the author differs in opinion from Dr. Cullen, and believes it is not the ficknefs that has the power of producing a crifis, or any appearance of crifis in a regular continued fever.

It appears then, firft, that feveral medicines, producing as great a degree of ficknefs as preparations of antimony, have no power whatever of carrying off fever, by producing crifis, or appearances fimilar to crifis, or in any other way.

Secondly, that producing ficknefs prevents medicines generally from operating in their own appropriate manner.

Thirdly,

Thirdly, that preparations of antimony, when they produce ficknefs in fmall dofes, are not fo efficacious in carrying off fever, as when it requires a larger dofe of them to produce naufea, and alfo that they are more efficacious when no naufea is produced; and therefore, upon the whole, that it is not the naufea produced by preparations of antimony, that renders them efficacious in producing fymptoms fimilar to thofe that take place in the crifis of a fever, and fo carry off the difeafe. On the contrary, that any preparation which can be made to act with certainty in a larger dofe, without producing naufea, is preferable for carrying off fever. Further, that tartarifed antimony, prepared by boiling crocus metallorum with tartar in water, and not purified by a repeated folution and cryftallization, is the beft manner of preparing the compound of tartar and antimony for this purpofe.

The next queftion is, whether tartarifed antimony prepared, as has been defcribed, or regulus of antimony mechanically mixed with fulphur, as in that preparation which has been called kermes mineral or the calx of
antimony,

antimony, mixed with calx phofphorata, which formed at leaft a principal part of Dr. James's powder, and is the pulvis antimonialis of the laft edition of the London Pharmacopeia, are the preferable preparations of antimony for immediately producing fymptoms fimilar to thofe that take place in the crifis of fevers.

The regulus of antimony in the kermes mineral, the calx of antimony in the pulvis antimonialis, are neither of them foluble in water. It has been held by many practitioners, that fubftances not foluble in water, muft be combined with fome menftruum in the ftomach with which they form compounds foluble in water to be efficacious. If this be the cafe, thefe preparations of antimony, to wit, kermes mineral and pulvis antimonialis, will be fubject to an uncertainty in their operation, by their meeting with or not meeting with a menftruum with which they may combine fo as to form a compound foluble in water.

The firft thing then to be enquired into is, whether it be true, that if any folid fub-

ftance,

ftance, infoluble in water, be thrown into the ftomach, it will act upon the ftomach and inteftines, or fyftem generally, without finding a menftruum with which it will combine fo as to form a compound foluble in water.

It is well known, that fulphur thrown into the ftomach in fine powder, as it is when precipitated from an alkali by means of an acid, or in fine cryftals, as when it has been recently fublimed, will act as a purgative.

In either of thefe cafes, if the fulphur be perfectly pure and unmixed with any extraneous matter whatever, it is not foluble in water in the fmalleft degree. It is true, that if fulphur be thrown into water, and left in the water with the furface of the water expofed to the atmofphere for fome length of time, the fulphur will combine either with the air of the atmofphere or of the water, and form vitriolic acid, which is foluble in water. Sulphur recently precipitated from an alkali by means of an acid, or recently fublimed, has not acquir-

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ed any air, it acts however equally as a purgative. Moreover, vitriolic acid rarely acts as a purgative in any dose given uncombined with any other substance, whereas sulphur rarely fails of acting as a purgative.

It is therefore to be considered, whether sulphur meets with any substance in the stomach with which it will combine, so as to form a compound soluble in water.

In the first place, it meets with water in the stomach with which, it has been already said, it will not combine, nor will it be altered, excepting by long digestion, in the heat of the human body. If it should alter by combining with the pure air of the water, the acid thus formed rarely acts as a purgative; nor does inflammable air, the other element of the water, act as a purgative. It is therefore extremely improbable that it should act as a purgative, by decomposing the watery fluid that it meets with in the stomach.

The water found in the stomach is im-

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pregnated with animal mucilages, such as the folid matter of the mucus; but water, impregnated with animal mucilages, is not decompofed more readily by fulphur being applied to it, nor does it more readily combine with fulphur in confequence of its being already combined with fuch animal mucilage. The gaftric juice, as it is called, in counter-diftinction to other fluids found in the ftomach, has been thought by fome to be a powerful menftruum, and to unite with the food, fo as to form chyle or fome compound preparatory to the formation of chyle. This folvent power of the gaftric juice the author has argued in his Treatife on Digeftion, the refult of which argument appears to be, that it has no fuch folvent power; on the contrary, it appears that its fole power is to coagulate certain animal and vegetable fubftances, fo that they may be retained in the ftomach until they go through that part of the procefs of digeftion which is neceffary in the ftomach. No experiments have been made to fhew whether or not this gaftric juice will combine with fulphur, fo as to form with it a compound foluble in water. It is extremely

improbable

improbable that it does, fince water, combined with other mucilaginous matters, does not diffolve fulphur more readily than pure water. Gaftric juice renders certain fubftances infoluble in water, that are otherwife capable of being combined with it; it is therefore improbable, that gaftric juice fhould combine with fulphur fo as to form a compound with it foluble in water.

In the juices of the ftomach, there is fea falt, that is, natron muriatum; ammonia muriata, and ammonia phofphorata, and fometimes, perhaps, calx muriata, as there are in all the other juices of the body, but none of thefe falts combine with fulphur fo as to form a compound foluble in water.

Other fubftances are found in the ftomach fometimes, but not always; but fulphur almoft always proves purgative, and therefore does not act on the ftomach and inteftines, in confequence of meeting with a fubftance in the ftomach which is accidentally found there.

Sulphur

Sulphur, therefore, does not act as a purgative in confequence of any thing it meets in the ftomach with which it forms a compound foluble in water.

Sulphur, when it gets into the duodenum, meets with bile which might combine with it, and form a compound foluble in water. The like might happen with pancreatic juice, with which it often meets in the duodenum. From the author's experiments, which it would be too great a digreffion to relate here, fulphur is neither capable of combining with bile nor pancreatic juice, and therefore fulphur does not act by combining with bile or pancreatic juice fo as to form a compound foluble in water.

The fame obfervations may be made with regard to the other fluids it meets with in the inteftinal canal; it is at leaft extremely probable, that it does not combine with any of them fo as to form a fluid capable of being combined with water.

Sulphur is capable of being combined with that vapour which Vanhelmont firſt took notice of, and called gas, but which has ſince been called fixed air, and by many other names. This vapour is found ſometimes in the inteſtinal canal. It is alſo capable of being combined with inflammable air. Neither of theſe vapours is found generally in the inteſtines, whereas ſulphur acts almoſt always as a purgative.

We muſt therefore conclude that ſulphur acts upon the ſtomach and inteſtines in a ſolid form. It is alſo capable of acting on them independently of any mechanical effect ; a ſolid is therefore capable of acting on the ſtomach and inteſtines medicinally.

Regulus of antimony, and the calx of antimony made by mixing antimony with ſhavings of hart's-horn, burning them together, and expoſing them to a great degree of heat, may act upon the ſtomach without being combined with any ſubſtance, ſo that the compound is ſoluble in water, and

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therefore may act independently of any men-
ftruum they may meet with in the ftomach.

It has been often affirmed in medicine,
that whatever was fhewn to be poffible, was
alfo true. This is a propofition totally re-
pugnant to all the laws of evidence; it
does not follow, therefore, that although
one folid in powder may act upon the
ftomach and inteftines, every folid does.
The next queftion then that comes to be
difcuffed is, whether the fine powder of
the regulus of antimony in kermes mineral,
and the calx in the pulvis antimonialis, do
act in a folid form without being com-
bined with fome fubftance with which they
form a compound foluble in water.

In the healthy ftate of the body, the fine
powder of the regulus of antimony in
kermes mineral, and the calx of antimony
in the pulvis antimonialis, being thrown into
the ftomach, will frequently act as an
emetic.

In the healthy ftate of the body, there is
no acid in the ftomach not combined with

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an alkali, therefore neither of thofe prepa-
rations of antimony can act in confequence
of being diffolved by an acid in the ftomach,
unlefs they fhould decompofe the neutral
falts. Whether they can decompofe the
neutral falts, to wit, fea falt, common fal-
ammoniac, or phofphoric ammoniac, as
they are applied in the ftomach, or whether
they are foluble in the neutral falts them-
felves, is not known, and therefore the ar-
gument muft be taken on another ground.

If tartarifed antimony, prepared as has
been defcribed, be exhibited to a man in
health, it hardly ever happens that a third
part of a grain can be taken without pro-
ducing ficknefs and vomiting, or purging.
It very rarely produces any naufea, if taken
in the quantity of a fifth part of a grain,
by an adult. On the other hand, the pulvis
antimonialis, or kermes mineral, will fome-
times produce ficknefs and vomiting,
taken in the quantity of three grains; on
the other hand, they may be taken very
often to the quantity of eight or ten grains,
without producing any fenfible effect. The

author-

author has feen them often employed to
the quantity of twelve or fifteen grains,
without having any apparent effect at all.

Moreover, kermes mineral, and the
pulvis antimonialis, the author has feen, in
feveral inftances, exhibited at the interval of
fix hours, for four and twenty hours, or
forty-eight hours, without producing any
fenfible effect, and at laft, all at once, they
have brought on a fevere vomiting and
purging, fo as to weaken the patient very
much.

It muft, therefore, be concluded, that
either they are not active in a folid form,
unlefs combined with fome menftruum
that will form with them a compound
foluble in water, or otherwife that act-
ing in a folid form, they are very
uncertain in their operation. In either
cafe, tartarifed antimony is a prefera-
ble preparation to kermes mineral, or
the pulvis antimonialis, or Dr. James's
powder, which partakes of all the uncer-
tainty of the pulvis antimonialis.

The

The author does not by any means fay that tartarifed antimony, prepared as has been defcribed, is the beft poffible preparation of antimony. On the contrary, he thinks that if a preparation was to be found out, of which the ftomach would bear a much larger dofe without ficknefs, and act with the fame certainty, it would be preferable to tartarifed antimony, prepared as has been defcribed.

Another circumftance muft be remarked. If tartarifed antimony be diffolved in a large proportion of water, it, like all other metallic compounds with acids which are foluble in water, will be decompofed, if the folution ftands with a furface expofed to the vapours which conftitute the atmofphere. It will be lefs apt to be decompofed, if it be diffolved in recently diftilled water, than in river, fpring, or rain water. It will be ftill lefs apt to be decompofed if combined with wine, and efpecially a fweet and ftrong wine; it is, therefore, much better to keep it diffolved in wine. The folution is convenient when the wine contains a quarter

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of a grain of tartarifed antimony, in half a dram by meafure of the wine, as in the vinum antimonii tartarifati of the London Difpenfatory. Of this folution, half a drachm by meafure may be exhibited, or any greater or lefs quantity, mixed at the time of exhibition with an ounce of any watery vehicle, before it has time to decompofe.

The other preparations of antimony, excepting thofe which have been enumerated, which are hitherto known, are fo uncertain in their operations, as to make them totally unfit to be employed in fever.

It is an undoubted fact however, that other preparations of antimony than the three enumerated, have been exhibited to a patient ill of a fever, and have occafioned appearances fimilar to thofe which take place in the crifes, which happen during the progrefs of regular continued fevers left topurfue their ordinary courfe. Such crifis has terminated the fever in the manner in which it is terminated by an ordinary crifis, fo that the patient

has

has been freed from the fever in a few hours, it has not afterwards recurred; but they act fo uncertainly, that it is not worth while employing them.

Preparations of antimony, when exhibited to a man in perfect health in fuch a dofe as juft not to produce ficknefs, occafion, after two or three hours, a breathing fweat, and foftnefs of the fkin, not unfrequently a lateritious fediment in the urine, open the body, and produce afterwards an univerfal tranquillity over the whole fyftem. They occafion therefore appearances fimilar, as much as can be, to thofe which take place in the crifis of fever.

It is attefted by many authors, that on the exhibition of Dr. James's powder, the pulvis antimonialis, kermes mineral, and tartarifed antimony, in two or three hours afterwards, or from that to five or fix hours, the fymptom which ordinarily arife in the crifis of fever have taken place, and that the fever has been carried off in lefs than twenty-

twenty-four hours, fo that the patient has perfectly recovered.

The author has feen each of thefe preparations of antimony exhibited in a fever during the ordinary progrefs of the difeafe, in the firft week of a fever as well as in the fecond week of the difeafe. He has feen in lefs than five hours after the exhibition of the medicine, the fymptoms which take place in the ordinary crifis of a continued fever arife, and the fever has ceafed in lefs than twelve hours.

This effect of thefe medicines the author has feen, in many cafes, where there was no appearance that a crifis would have taken place in the fever, fuppofing that it had been left to purfue its ordinary courfe.

A crifis generally takes place, in a regular continued fever, in the night time; that is, from four to fix, or eight o'clock in the morning; the author has feen it produced at other times of the day.

When

When thefe preparations of antimony have been exhibited, the author has feen fevers much more frequently carried off by crifis, than in proportion to the number of crifes which happen in fevers left to purfue their ordinary courfe. He has feen thefe things happen in many hundred cafes of fever; it may therefore be concluded, that thefe preparations of antimony, being exhibited in a fever, often produce fymptoms fimilar to thofe which arife in the ordinary crifis of fever, or, in other words, a crifis fimilar to the ordinary crifis in fever, and carry off the difeafe.

The next queftion which occurs is, whether there is any other medicine which produces the fame effects either more certainly, lefs certainly, or equally with the preparations of antimony which have been enumerated? It is matter of confideration whether this queftion fhould be firft difcuffed, or whether it would be better to enter into the argument in what manner the preparations of antimony, hitherto defcribed, fhould be employed,

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employed, fo as to have the beft chance of carrying off the difeafe.

There are many reafons that might be urged for taking the one or the other argument into difcuffion firft; but it is not worth while taking up time in difcuffing this; it is therefore the author's determination, upon the whole view of the fubject, to purfue the beft method of employing preparations of antimony to produce crifis in fever, though he is not fure that he is right, as he may be obliged, in many inftances, to take notice of the effects of other medicines which have a fimilar action in fevers, and produce a crifis in them.

The author has already faid, that when a patient is attacked with fever, it often happens that there is undigefted food in the ftomach, which will therefore require to be evacuated. From the fever itfelf, likewife, other noxious matter is probably produced in the ftomach, in fome degree fimilar to that which we find covering the tongue. It is
neceffary

neceffary to evacuate fuch undigefted food, becaufe by remaining it may contaminate the food that may be afterwards thrown into the ftomach, by exciting in it the acetous, pu- trefactive, or other noxious fermentations, and prevent it from being converted into a fubftance which is afterwards to be formed into chyle.

Vomiting in itfelf has a tendency, after the ficknefs which produced it is over, to occafion a glow or warmth over the whole body, followed by moifture on the fkin, foftnefs of it, an univerfal foftnefs and re- laxation of the whole mufcles, a flow of fluids through the whole fecretory veffels, a general tranquillity over the whole fyftem, and a difpofition to fleep.

Although vomiting induced by any means has this effect, in fome degree, when the ficknefs occafioning it is gone off, yet it has not the fame effect, in an equally powerful manner, when produced by any means whatever.

If

If vomiting be produced by tickling the throat, by introducing any folid fubftance into it, as a feather or the finger, or if by a cough the larynx be forced up into the throat, fome fenfible effect fimilar to what has been juft defcribed takes place. If preparations of antimony or ipecacuanha be exhibited fo as to produce vomiting; when the ficknefs is gone off, the appearances of crifis, which have been above defcribed, arife in a much greater degree.

Although therefore all emetics, when the ficknefs is gone off which occafions the vomiting, have a tendency to produce appearances fimilar to the appearances which take place in the crifis of fever, and therefore actually tend to produce crifis in fever, yet they do not all tend to produce crifis of fever equally: therefore it is better to choofe fuch fubftances as emetics, which have the greateft tendency to produce critical fymptoms after the vomiting is gone off, than fuch as have a lefs tendency to produce the appearances fimilar to thofe taking place in crifis, in order that the emetic may have

a better

a better chance to produce a crisis in the disease.

It is therefore better to employ preparations of antimony or ipecacuanha, as emetics, in the beginning of a fever, than warm water, infusion of camomile, white vitriol, squills, &c. which have no tendency to produce symptoms similar to those which take place in a crisis of fever, independent of the action of vomiting.

It is not always that any of the preparations of antimony known produce vomiting, when exhibited to a man either in health or in a fever. Sometimes tartarised antimony in the dose even of several grains, does not produce vomiting but purging, given either in health or to a patient affected with fever. It is wished, however, that we should be certain of producing vomiting to occasion the evacuation of any noxious matter, such as has been described, from the stomach.

Ipecacuanha, the root of a plant, which the jealous government of Spain has prevented

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the perfect inveſtigation of, is very certain in its operation as an emetic, much more ſo than any other ſubſtance which is at preſent known. It has beſides the ſame kind of power which antimony has, though perhaps not in ſo great a degree, of producing thoſe appearances which take place in the ordinary criſis of a fever. It is therefore better to mix ipecacuanha with tartariſed antimony, and exhibit them ſo mixed as an emetic at the beginning of fevers.

The next point to be argued is, the doſe of the medicine we are to employ as an emetic at the beginning of fevers.

When a medicine is to be exhibited as an emetic under one view, it does not appear to be of much conſequence how large the doſe is. Let the doſe be ever ſo great, the firſt evacuation would ſeem to bring up every thing which is ſuperfluous, ſo that the ſuperfluous part of the doſe ſhould no longer act. This conſideration explains why the very various doſes of emetics which have been exhibited in various caſes,

produce

produce very often nearly the fame effect.
Though this be the cafe in many inftances,
it is not in all. It happens alfo in many in-
ftances, that a large dofe of an emetic pro-
duces moft violent vomiting, which is re-
peated many times with great diftrefs to
the patient, fo that it would feem that an
emetic may lie fo long upon the ftomach,
before it is brought up, as to make an im-
preffion, which lafts after the emetic itfelf
is entirely evacuated.

In fevers the violence of the exertions,
when an emetic thus continues to operate,
perhaps fix or eight times, in the firft place
exhaufts the force of the fyftem, which is
not to be thrown away in this difeafe, and
therefore on this account too large a dofe of
the emetic fhould be avoided.

Moreover, it has already been obferved,
that when any medicine is made to act in
too great a degree, it lofes its proper effect,
and becomes a fimple ftimulant. So the
action of vomiting itfelf, by being too fre-
quently repeated, from exhibiting too large

a dofe

a dofe of the medicine, does not produce appearances fimilar to thofe which arife in the crifis of fever, fo as to carry off the difeafe. For this reafon ipecacuanha and antimony do not produce thefe appearances, if given in too great a dofe. Thus by giving too large a dofe of thefe medicines as emetics, the effect of carrying off the fever either by the action of vomiting itfelf, or by the effects of the antimony and ipecacuanha, are fruftrated.

The proper dofe may be about eight grains of ipecacuanha, and one grain of tartarifed antimony.

If an emetic of almoft any kind, which takes up a very fmall volume, be exhibited, if there fhould be nothing in the ftomach to be evacuated, there arifes an effort to evacuation, or in other words a reaching, which is attended with a great deal more uneafinefs and pain, than if there was a quantity of fome fubftance in the ftomach to be evacuated. This has induced practitioners to give, after an emetic has been exhibited,

exhibited, watery fluids to drink, fo that there fhould be fomething to be evacuated, in order to take off the uneafinefs and pain of the reaching.

At the beginning of a fever emetics, as we have juft obferved, are employed for two purpofes: Firft, to evacuate from the ftomach any undigefted food which was contained in it when the fever took place, or thrown into it afterwards, or noxious matter formed in the ftomach in confe-quence of the fever. In the fecond place, by the action of the vomiting, and of the medicines employed as emetics, joined to-gether, to induce a crifis to the fever, fo as to put an end to the difeafe.

For the firft of thefe purpofes, to wit, evacuating noxious matter from the ftomach, if it were undigefted food, two or three evacuations by vomiting are certainly fuffi-cient, and efpecially if after the firft eva-cuation a quantity of warm watery fluid be thrown into the ftomach. If noxious matter be formed in the ftomach itfelf in

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confequence of the fever, and if that fhould affixed to the ftomach, as the cruft is to the tongue, no force will ever feparate it, and if it fhould not be fo affixed, two or three evacuations will be fufficient to carry it off; fo that if two or three fits of vomiting fhould take place, it is fufficient for all the purpofes that are wifhed for from the vomiting, and will not prevent either the act of vomiting itfelf, or the effect of the medicines, which have been enumerated as proper to produce it, from bringing on the appearances which take place fimilar to thofe that arife in the ordinary crifis of fever.

It does not feem indifferent at what time of the day an emetic is employed, if we wifh it to produce any other effect than fimply to evacuate the noxious matter contained in the ftomach in fever.

In the firft place, the operation of vomiting, after it is over, tends to produce fleep. Mankind generally are difpofed to fleep about nine, ten, or eleven in the evening. If then the difpofition to produce fleep,

<div align="right">brought</div>

brought on by the emetic, coincides with the ordinary time of the twenty-four hours in which there is a difpofition to fleep, the two together will be more powerful in producing their effect, than either of them alone. The reft thus procured by this double difpofition will be founder and more refrefhing, than it would have been from either of them fimply, and will tend to reftore and fupport the ftrength of the patient. Moreover, it has been obferved, that fleep produces a difpofition for all derangements of the fyftem to go off, and confequently fever; it therefore increafes the chance of the action of the vomiting, and the power of the remedies employed to produce it, in occafioning the appearances which arife in the ordinary crifis of fever, and confequently in carrying it off.

Secondly, it has been obferved, that the exacerbation of a regular continued fever takes place generally between five and fix o'clock in the evening, and that the effort to a crifis made in the hot fit is

ftrongeft

ftrongeft about three or four o'clock in the
morning. If the emetic be then exhibited
between feven and eight o'clock in the even-
ing, the difpofition to crifis produced by
the vomiting itfelf, by the action of the
fubftances employed as emetics, by the fleep,
and by the ordinary effort of the fever it-
felf, will all co-operate together fo as to
have a better chance of producing a crifis
in the difeafe.

It would therefore feem, when we employ
an emetic in a fever, to evacuate any
noxious matter from the ftomach which
has got into or formed in it by the means
above defcribed, that it is better to exhibit
in a moderate dofe fuch fubftances as eme-
tics, which, if they are not exhibited in
fuch dofes as to produce ficknefs, have a ten-
dency to produce fymptoms fimilar to thofe
which take place in the ordinary crifis of
fever. It feems alfo neceffary to prevent
the violence of the reaching by introducing
fome watery fluid into the ftomach, but
that it is better not to employ the watery
fluid in too great a quantity, nor re-

peat

peat it too frequently. It is likewife better to exhibit the emetic about feven or eight o'clock in the evening. Thus the action of the vomiting itfelf, of the medicines employed to produce it, the fleep, and the ordinary effort of the evening paroxyfm of fever itfelf, will all co-operate together fo as to tend to bring on a crifis, and fo terminate the difeafe.

If any one fhould think the author is too minute in thefe attentions, he muft confider that if, by omitting any of them, a crifis fhould not be produced when it otherwife might have been, the patient may be fubjected for a fortnight, or longer in fome inftances, at leaft, to a diftreffing and dangerous difeafe.

It happens fometimes, when an emetic is employed, that with every precaution the ficknefs will continue, and the patient fhall pafs a reftlefs and diftreffing night, more fo than would probably happen if no emetic had been exhibited ; but this muft be left to be confidered among the irregularities which

happen

happen in the difeafe. Neverthelefs, it is neceffary to employ an emetic to clear the ftomach of any noxious matter that may be left in it from the laft food that was employed, or that may be generated in it in confequence of the difeafe, in as much as fuch noxious matter would occafion much greater diforder if it was not evacuated.

It happens not uncommonly that when a patient has taken an emetic, efpecially if regulated as is defcribed above, he falls in lefs than an hour after its operation into a quiet fleep ; a gentle eafy perfpiration takes place at firft, and increafes into a fweat more or lefs profufe ; all the fecretory veffels are relaxed, and the fkin and the mufcles alfo ; a perfect crifis is produced, and the patient is freed from the difeafe.

It happens likewife not uncommonly, that though perfect crifis does not take place, the fever is confiderably alleviated, and goes through its remaining courfe with lefs danger to the patient.

The

. The author thinks, that if a practitioner be confulted in the beginning, that is, in the firft four or five days, an emetic fhould always be exhibited in a regular continued fever.

Independent of vomiting, preparations of antimony, fuch as have been defcribed, have the power of producing appearances fimilar to thofe that arife in the ordinary crifis of a regular continued fever. Thefe preparations of antimony have been employed in two ways to produce fuch crifis.

Firft, if fome one of the preparations above defcribed be exhibited in a dofe juft not fufficient to produce ficknefs (when they have been exhibited empirically this has not been much attended to) in the evening about fix o'clock ; if the fame dofe be repeated about half an hour paft eight, and again at eleven; if the patient be laid in flannel or cotton, or fome other bad conductor of heat, his head bound round with a cloth of the fame kind, and fmall quantities of fome warm watery fluid, fuch as barley water, be given frequently, fo as to throw the patient

tient into a profuse sweat if possible; and
this sweating be kept up by repeating the
preparations of the antimony every four,
five, or six hours, as the patient can bear
it, without occasioning any sickness; and
if this practice should be continued for four
and twenty hours, it has happened, in
many cases, that when the preparations of
antimony, above described have been ex-
hibited in this manner, a crisis has been
produced, and the fever entirely carried off.
This happens particularly if the remedy be
exhibited in the first three or four days of
the disease; the crisis is thus very evidently
the effect of the medicine. There is a degree
of brilliancy in this practice which has made
it be adopted by many practitioners who
have a degree of empiricism.

It is to be observed, that such practi-
tioners, and all empirics, have often exhi-
bited antimony in this manner, or some-
times in one dose without repetition, at any
time in fever, sometimes with success, but
this will be considered afterwards.

<div align="right">The</div>

The mode in which antimony appears to the author to have the beft effect, with the leaft detrimental confequences, is, in the firft place, to employ it as foon as poffible in the difeafe; for it is more efficacious in the firft attack of the fever, than in the fecond day of the difeafe, counting the days as has been before pointed out. It is more efficacious in the fecond day of the difeafe than in the third, and fo on the third than in the fourth, &c.

It fhould be employed in the firft place as an emetic, mixed with ipecacuanha, as has been already defcribed. If the weather fhould be cold, it is better to lay the patient in cotton, and treat him as has been de-fcribed, in the management of a regular continued fever left to purfue its natural courfe.

After having exhibited the emetic, as has already been defcribed, when the vo-miting has ceafed, the patient being in bed, if he fhould continue fick and reftlefs, as has been above defcribed, which is

fometimes

fometimes the cafe, about a grain of opium, or a dofe of tincture of opium, equivalent to a grain, may be given without detriment, along with a little tincture of cinnamon or any other aromatic. This medicine fhould only be exhibited under the circumftances of the patient's continuing fick and reftlefs, in which cafe it takes off the ficknefs, and fuffers the antimony to act.

Six hours after the action of the emetic is over, if the patient fhould be awake, a dofe of one of the preparations of antimony above defcribed, fhould be exhibited in fuch quantity as the ftomach can bear without ficknefs. If he fhould be afleep at this interval from the laft action of the emetic, as foon as he awakes it fhould be given.

The author prefers tartarifed antimony, prepared as is defcribed above, in the laft edition of the Pharmacopeia of the London College.

The dofe of tartarifed antimony the author would exhibit, in the firft inftance,

is

is two fevenths of a grain, or if the tartar-
ifed antimony be diffolved in wine, as is
above defcribed, in the vinum antimonii
tartarifati of the Difpenfatory, thirty drops
of this folution dropped out of fuch a vial
as is commonly made to contain two ounces
in this country.

The author is fenfible of the uncertainty
of meafuring any thing by drops. The
quantity contained in a drop depends upon
the vifcidity of the fluid dropt. Four
drops and an half of alcohol, for example,
dropt from the fame veffel, weigh only one
drop of water, the alcohol being much lefs
vifcid than the water.

Again, the fize of a drop depends upon
the thicknefs of the lip of the vial from
which it is dropt, or rather on that part of
the lip from whence it is dropt. Thefe diffi-
culties may be eafily obviated, by trying
how many drops of any fluid dropt from
one part of the lip of any one vial meafures
or weighs. If the vial be not above four-
fifths full, the fame number of drops, if

they

they exceed twenty, will be found always nearly of the same measure and weight.

The author prefers this mode of determining the dose as the easiest and most readily measured.

It has this advantage, that if thirty drops of the vinum antimonii tartarisati should produce, on its first exhibition, any nausea, it may be diminished by four or five drops on the second exhibition. If upon this second exhibition it should produce no nausea, or if upon its first exhibition, in the quantity of thirty drops, no nausea should ensue, an additional quantity of two drops may be added to each dose, until the greatest quantity is found out that the stomach can bear without nausea. The author has already observed, that nausea prevents the medicine from having such a disposition to produce symptoms similar to those that arise during the crisis of fever, and so carry off the disease. The practitioner can therefore thus ascertain the exact dose which can be given without producing nausea.

If

If the author fhould be miftaken in think-
ing that tartarifed antimony, prepared as has
been defcribed, is the beft preparation of
antimony for producing crifis in fever al-
ready known; or if fome better preparation
fhould be found out ; yet as the ftomachs of
different men, or the ftomach of the fame
man at different times, are differently im-
preffed by the fame dofes of almoft all medi-
cines, he conceives that fome mode fhould
be taken fimilar to that which has been de-
fcribed above, to afcertain what quantity the
ftomach can bear of the preparation of an-
timony employed without naufea, and that
it fhould be exhibited in that dofe.

Along with the firft dofe of antimony
to be exhibited in fix hours after the laft
operation of the emetic, it may be proper
to give a moderate quantity of fome aro-
matic, fo as to render it more agreeable to
the ftomach of the patient, fuch as infufion
or diftilled water of mint or cinnamon, or
any other medicine of the fame kind.

It

If the emetic exhibited fhould have pro-
duced a quiet gentle fleep, and the fymptoms
of a crifis appear; if the pulfe has returned
to the ordinary number of pulfations in a
given time, and the patient fhould appear to
be entirely freed from the fever; yet it will
not be fuperfluous to repeat the preparation
of antimony in the manner defcribed, as no
mifchief whatever can arife from it, and it
may fecure the patient from the return of
the difeafe.

After a dofe of antimony is thus exhi-
bited, it is to be repeated at four or five, or
fix hours interval.

The interval is to be determined from the
effects which this dofe has produced.

If the patient has had a crifis produced
by the emetic, and a general freedom from
the difeafe has taken place only with fome
languor, it will be fufficient to repeat it
every fix hours, and continue it for twenty-
four hours.

If

If hardly any relaxation fhould have taken place in confequence of the emetic, but all the fymptoms of fever, fuch as great depreffion of ftrength, weight about the precordia, pain in the forehead, drynefs of the fkin, &c. fhould remain in a great degree, it will then be proper to repeat it every four hours, and continue fuch repetition for four or five days.

If a preparation of antimony is given in this way at the beginning of fever, and continued for four or five days without producing a crifis, fo that the fever is cured or converted into an intermittent, it rarely produces a crifis afterwards; neverthelefs it often makes the relaxations greater, prevents or diminifhes delirium, and makes the whole fever go on with lefs violent fymptoms. It is better therefore to continue to exhibit fuch a dofe of the preparation of antimony, as the ftomach will bear without naufea, every fix hours. When fymptoms of weaknefs begin to appear, or if the antimony fhould produce fweating, purging, or any other topical evacuation, without re-

lieving

lieving the fever, it is immediately to be omitted.

It happens, in many inftances, that in the courfe of this time the patient has a moifture produced in the fkin, a lateritious fediment takes place in the urine, the fkin by degrees grows foft, the tongue begins to grow moift on the edges, and is cleared of the cruft that forms upon it, all the other critical fymptoms take place gradually, and the patient is freed from the difeafe.

If either the fymptoms of the attack of the difeafe fhould be fo violent as to give little hopes that the patient will recover, if the difeafe fhould purfue its ordinary courfe, or fuch an epidemic fhould be prevalent as deftroys the greateft number of patients afflicted with the difeafe; in fuch cafes, perhaps, it might not be improper to force a profufe fweat in the manner that has been defcribed.

Unlefs however there fhould be little hopes of the patient's recovery if the difeafe fhould

should go on in its ordinary progress, such means of occasioning sweating ought by no means to be employed.

First, because sweating, though it be one of the appearances that take place in the ordinary crisis of fever, yet it is very far from being the only one; or, not only the secreting vessels of the skin are relaxed, and secrete a larger quantity than usual, but all the other secretory vessels are equally relaxed, and also the muscles and whatever other part is relaxed in the ordinary crisis of fever. We see also that profuse sweating takes place sometimes in a regular continued fever without any relief to the disease.

In the second place, every unnecessary evacuation tends to weaken the patient, and give him a less chance of being supported through the course of the disease if a crisis should not be produced.

Therefore it is not proper to attempt to produce profuse sweating, if there be any

tolerable

tolerable chance of the patient's recovery, provided the difeafe fhould be left to purfue its ordinary courfe.

Hitherto the author has been fuppofing the patient to apply to a practitioner in the firft day or two of the fever. In that cafe, provided the difeafe be a regular continued fever, by employing preparations of antimony in the manner defcribed, fymptoms fimilar to thofe which take place in the ordinary crifis of fever will be produced, as far as the author can judge from his experience, in one half, perhaps he thinks he can fay certainly in one third of regular continued fevers.

If no medicine has been given during the firft days of the difeafe, or if no emetic has been exhibited, it will be proper to employ an emetic in the manner which has been mentioned any time in the firft week of the difeafe, or even on the eighth or ninth day, efpecially if there fhould be a greater foulnefs of the tongue, or more naufea than

in

in proportion to the other fymptoms of the difeafe.

If an emetic fhould have been employed at the beginning of the difeafe, and the patient at any time afterwards during the courfe of it fhould have a greater foulnefs of the tongue, weight upon the ftomach and naufea, than in proportion to the other appearances of the difeafe, it is proper to repeat the emetic. In this cafe, about five grains of ipecacuanha fhould only be given, which rarely fails of proving emetic. It fhould be exhibited in the evening, but the other regulations that have been laid down for the exhibition of an emetic at the beginning of the difeafe, are not neceffary to be attended to.

If no preparation of antimony has been exhibited on the firft two or three days of the fever, the exhibition of it afterwards will have lefs chance of carrying off the difeafe; for after the fever has continued for longer than three days, the fyftem has acquired an habit which renders the difeafe

more

more fixed. Although the fooner the preparation of antimony is employed, the production of a crifis or gradual going off of the difeafe, by critical fymptoms taking place after each other, is more probable, yet the fever in many inftances will be carried off by the exhibition of it before the end of the fecond week of the difeafe. The fooner however it is exhibited, it will have the greater chance of removing the fever.

Although preparations of antimony fhould not produce a crifis fo as entirely to carry off the fever, they produce a crifis in many cafes, which though not quite perfect, yet converts the difeafe into an intermittent fever, which is a difeafe much eafier managed than a continued fever.

Suppofing preparations of antimony not to produce fuch a crifis as to convert a continued fever into an intermittent, or carry off the difeafe, yet it happens in many cafes that they give great relief to the patient, fo that the head-ach is diminifhed or entirely carried off, fuch a degree of delirium does

not

not take place as otherwife probably would have done, the primæ viæ are not fo much difordered, and the fever purfues its courfe without fo much diftrefs and danger to the patient as it otherwife would have done.

It happens fometimes that there is great hardnefs, fulnefs, and ftrength of the pulfe, as well as obftruction ; that with thefe there is flufhing of the face and rednefs of the eyes in the firft two or three days of the fever, and that other fymptoms of general inflammation take place in fuch a degree as to render it neceffary to take away a quantity of blood ; it then becomes a queftion whether preparations of antimony fhould be employed immediately at the beginning of fuch fever, before blood is taken away.

This is a cafe which happens much feldomer than would be fufpected from what authors have written on this difeafe, and the argument will be entered into in that differtation in which the irregularities that take place

place in continued fevers will be treated
of.

If upon exhibiting preparations of an-
timony fome one evacuation fhould take
place, without a relaxation of the other fe-
cretory veffels, the antimony fhould not be
perfifted in. If profufe fweating fhould
be produced, and at the fame time the tongue
fhould remain dry and covered with a fur,
and the patient fhould remain coftive and the
other parts contracted : if a lateritious fe-
diment fhould appear in the urine, or a
flaky white fediment, the fkin remaining
dry and contracted, and the tongue dry and
covered with a fur : if the patient fhould
be purged, the fkin remaining dry at the
fame time; in any of thefe cafes there is
little hope of antimony being of any kind
of ufe if the fyftem fhould continue in
this ftate for forty-eight hours. It will
rather tend to weaken and deftroy the pa-
tient, and therefore ought not to be con-
tinued.

It

It is next to be confidered whether there is any other medicine which has the fame effect with preparations of antimony ; that is, whether there be any other medicine that will induce the appearances which take place in the ordinary crifis of fever, fo as to carry off the difeafe.

In the hiftory of medicine that we are able to collect from the Greek and Roman authors, whofe writings have come down to us, there is one inftance only of a medicine having had this effect, to wit; when the phyfician of Alexander the Great exhibited to him a medicine, which is faid to have occafioned the appearances which ordinarily take place in the crifis of fever, fo as to carry off the difeafe in lefs than twenty-four hours. We have no trace of what this medicine might be, and it is fingular that the fame medicine fhould not have been exhibited to him again in that remittent, which he caught by furveying the marfhes of the Euphrates, near Babylon, in order to have them drained.

Cold

Cold water was exhibited by Greek phyficians, in fever, often evidently with a view of immediately putting an end to the fever. From the beſt information the author has been able to make out from peruſing their writings, they exhibited it reduced nearly to the freezing temperature, in the quantity of from one to two quarts at once, ſo as to produce great evacuation by vomiting, purging, and ſweating.

It was by no means the practice of the ancient Greek phyficians, who were the principal and almoſt only practitioners in the Roman dominions, to give watery fluids, or indeed any thing to drink at the beginning or during the paroxyſms of fever. In Petronius's ſatire, one of Trimalchio's gueſts ſays, that a man, whoſe funeral he had been at, was a very obedient patient to his phyficians, for he did not ſuffer a drop of fluid to paſs his lips for ſeven days, and he died notwithſtanding.

It was not the practice of the Greek or Roman phyficians to give cold water conſtantly

conftantly to drink in fmall quantities, but in a large quantity at once, perhaps with a view of drowning out the heat, which they confidered as the effence of the difeafe. It was to be drunk, as Celfus fays, *ultra fatietatem*. It is defcribed however as bringing on thofe appearances which take place in the ordinary crifis of fever, and in certain cafes as carrying off the difeafe.

This not having been the practice during the laft period of forty years, the author has had no experience of giving large quantities of cold water at once for drink, and cannot therefore fay what its effect may be. During this time it has been common, in confequence of Dr. Boerhaave's idea of rendering the fluids thinner in fever, to exhibit fmall quantities of warm watery fluids very frequently for that purpofe.

That warm watery fluids, forced upon the patient often in fevers, is of no manner of ufe, the author is obliged to believe from repeated experience. It would be eafy to fhew that every reafon, on which this

practice

practice was introduced, was perfectly without foundation, but as no knowledge whatever is to be gained by the difcuffion of this point, the author does not think it worth while to draw the reader's attention to the fubject.

It was alfo a practice among fome of the ancient phyficians to employ the cold bath, in certain cafes of fever, to produce a crifis, and fometimes the warm bath; but the hiftory of both thefe practices is fo little detailed in their writings, that the author has not been able to make out their effects, or whether they actually occafioned fymptoms fimilar to thofe that take place in the crifis of fever, or whether they actually carried off the difeafe or no.

The author has had good information, that both in Italy and Spain drinking large quantities of cold water at once, as well as ufing the cold or warm bath, are ftill in practice in difeafes called by them febrile, but he could never from their books, or from the converfation of the phyficians of thefe

countries

countries he has feen here, make out the idea they affix to febrile difeafes, nor the actions of thefe remedies.

The author muft therefore difmifs this fubject, viz. the application of cold water, as nothing is known of it at prefent from any thing which can be confidered as evidence. It requires half a century at leaft to deftroy the bloom of novelty which deludes when a new medicine is recommended, or fix any evidence in medicine. It was a great deal longer before the bark of the cinchona was brought into general practice in intermittent fever. It was longer ftill before mercury was allowed by regular practitioners to be employed in medicine.

The next fubftance which has a tendency to produce thofe appearances which take place in the ordinary crifis of fever, is the root of ipecacuanha, an American plant, and which could not therefore be known to the ancient Greek and Roman phyficians.

The

The root of this plant was firſt brought
into practice as an emetic.

There is a tendency in mankind to employ
almoſt every thing in medicine ; a tendency
perhaps given them by the Almighty to fup-
ply that want of the knowledge of the
ground on which medicines act, medicine be-
ing a ſcience of ſo very great difficulty. Of
the ſubſtances known in thoſe countries with
which Europeans were acquainted before
the diſcovery of America, almoſt every
thing had been tried and even celebrated in
medicine. Dead men's bones, cobwebs,
and the rags that enveloped the bodies of
the ancient Egyptians, as well as opium,
colocynthida and ſquills. Whenever, there-
fore, new countries were diſcovered, and in
conſequence new plants, we conſtantly find
practitioners in medicine uſing them in diſ-
eaſe ; ſo the root of the ipecacuanha was
found out to have an emetic quality, and
was employed firſt as an emetic. After-
wards, when it came into Europe, its other
effects began to be inveſtigated, its action in
rheumatiſm, in diarrhœa and dyſentery,
                                          and

in all which cafes it feems to be analagous in its operation with preparations of antimony.

The prefent enquiry is to determine how far it is analogous to preparations of antimony in fever.

It has been already mentioned, that if it is wifhed to produce vomiting at the beginning of fever, it is better at leaft to mix ipecacuanha with preparations of antimony, it being furer of acting as an emetic.

If at any time, during the progrefs of the difeafe, there fhould be a confiderable degree of ficknefs, efpecially if it fhould be attended with a thick brown fur upon the tongue, though an emetic has already been exhibited, it is ufeful to employ from five to ten grains of ipecacuanha to act as an emetic, as has been already obferved. It not only throws off any noxious matter that may be in the ftomach, but alfo produces moifture upon the fkin; the ficknefs is relieved, and fometimes a complete crifis takes place, and the fever is carried off.

H   If

If a fymptomatic purging fhould take place in fever, without any relief of the difeafe, if fuch purging fhould take place along with the fever, or foon after its beginning, as far as the author's experience goes, ipecacuanha is better ufed alone as an emetic. In this cafe it is alfo better to give fuch fmall dofes of it as juft not to produce ficknefs, every four or fix hours. They have a better chance of carrying off the purging, and likewife of producing fymptoms fimilar to thofe which arife in the ordinary crifis of fever, and fo entirely carry off the difeafe, than preparations of antimony.

In all cafes of fever, ipecacuanha feems to act much in the fame manner as preparations of antimony, in producing fymptoms fimilar to thofe produced by preparations of antimony, and in many inftances carry off the difeafe, though not with the fame certainty.

If we give ipecacuanha inftead of preparations of antimony, the ftomachs of moft patients will bear a grain without occa-

4   fioning

fioning ficknefs, and few ftomachs will
bear two grains without ficknefs.

In other refpects the fame attentions are
to be paid when we employ ipecacuanha,
as when we employ preparations of anti-
mony.

Several of the neutral falts, fuch as kali
vitriolatum, ammonia muriata, ammonia ace-
tata, and fome others, have been employed
in fevers with a view of producing the
fymptoms which take place in the ordinary
crifis of fever, in order to carry off the dif-
eafe.

The author has feen moifture of the fkin
arife after exhibiting them, but he can-
not fay that in any one inftance he could
determine that they brought on a complete
crifis in a regular continued fever. During
the exhibition of thefe neutral falts, an or-
dinary crifis fometimes takes place, but not
oftener than if they had not been exhibit-
ed, and therefore fuch crifis cannot be faid
to arife from their exhibition.

The

The author then upon the whole does not know of any remedy which has a tendency to produce a crisis in fever oftener than it would have taken place if no remedy whatever had been exhibited, whether such remedy has a tendency to produce vomiting or not, excepting preparations of antimony and ipecacuanha. Possibly it may be admitted, that the ancient Greek physicians for this purpose employed cold water internally, or the cold or warm bath, or some other remedy with which we are now totally unacquainted, with good effect.

Semicupium, or fomenting the lower extremities with warm water, is similar in some respects to the warm bath.

This practice has been used, especially when the patient is affected with delirium in the second week of the disease.

This practice is different from the warm bath, in as much as it can be employed without greatly disturbing the patient, and in consequence

confequence without wearing him out by exertion.

When fomentation of the lower extremities is employed, it fhould be applied in the evening. The bottom of the bed clothes, under the patient's lower extremities, fhould be covered with fome covering which will prevent them from being moiftened, which may be taken away after the fomentation is no longer applied.

The fomentation fhould be performed by moiftening flannel, or any thing which is a bad conductor of heat with water, heated to about an hundred degrees of Fahrenheit's thermometer. The flannel or other fubftance employed fhould be wrung out, fo as to leave very little moifture in it; afterwards it is to be applied to the legs and feet until it begins to cool. As foon as the flannel begins to feel cool, it is to be removed, and frefh flannel is to be applied moiftened with warm water. The time of cooling will be different according to the heat of the atmofphere at a medium about five minutes.

Frefh

Fresh flannels are thus continually to be applied for about half an hour; the covering of the under part of the bed clothes is then to be removed, and the upper part to be brought over the lower extremities of the patient, and he is afterwards to be left quiet.

It sometimes happens that a moderate sweat breaks forth, the patient falls asleep, and is considerably relieved. The author has seen in a few cases, but very few in proportion to those in which this practice has been employed, that a complete crisis has taken place, and the patient has been freed from the disease. In several cases the patient has slept, and the delirium has been considerably relieved. In the greater number of cases, however, no advantage whatever has arisen from the application, yet as it hardly tends to exhaust the patient, it is worth while to employ it.

Some, instead of moistening the flannel or other clothes with water, have employed mucilaginous substances dissolved in water,
<div align="right">such</div>

fuch as decoction of marfhmallow root, &c. and fome have employed decoction of poppy heads. The author's practice has not afcertained that any advantage has been gained by the addition of either of thefe ; in cafes where there have been appearances of putrefaction, fome have added a fmall proportion of vinegar. This addition feems, as far as the author can judge from the cafes in which he has feen it employed, rather to have prevented the good effects of the application ; but of this the author is not quite fure.

An inflammation of an exterior part of the body in many cafes carry off difeafes, which have arifen in other parts of the body.

Perhaps an inflammation of an interior part may alfo carry off difeafes which have taken place in other parts of the body.

Fever is one of the difeafes which is car-ried off by an inflammation of either an exterior or an interior part of the body.

It

It has been before obſerved, that an inflammation ariſing at the beginning of fever, particularly in the firſt paroxyſms of the diſeaſe, not uncommonly carries off the fever altogether. It has been alſo obſerved, that inflammation often produces very conſiderable affection of the whole ſyſtem, which many practitioners, both ancient and modern, have called and conſidered as fever. One principal ſcope of theſe diſſertations is to point out, that every affection of the ſyſtem, in which there is frequency of the pulſe, and an increaſed degree of heat, is by no means fever. Such affections of the ſyſtem almoſt always depend upon a continuance of their cauſe. When their cauſe is removed, the general affection of the ſyſtem goes off alſo, while the cauſe of a fever ſeldom hath any effect upon it after having made its firſt impreſſion. If it is removed, the fever almoſt always goes on; if it remains, the fever is rarely affected by it, but goes on through the ſame ordinary progreſs as if the cauſe had been entirely removed.

Thus

Thus an inflammation of the pleura generally produces at the time hardnefs, fullnefs, ftrength, and regularity of the pulfe, which however is much more frequent in the patient than in health. With this alteration of the pulfe from its common ftate, there is an increafed heat, both as to the fenfation of the patient, the phyfician, and to the thermometer. There is a cruft formed upon the tongue, fometimes white, more frequently of a yellowifh hue; there is a pain in the internal part of the head, flufhing in the face, and often delirium; there is lefs appetite, and there are other diforders in the fyftem. If the inflammation of the pleura be cured, as it fometimes is, by one copious bleeding, that is by taking away from four and twenty to thirty ounces of blood from the arm, all thefe appearances fubfide in lefs than twenty-four hours, and the patient recovers his health, excepting that he is fomewhat weakened : whereas, let a fever arife in confequence of expofure to cold or to infectious vapours, or almoft any other caufe of fever, the appearances continue and go through

their

their ordinary courfe equally, whether the cold or infection continue to be applied or not.

The author has already obferved, that it happens often in fever that inflammation takes place at the very beginning of the difeafe, in the firft or fecond paroxyfm, and that fuch inflammations immediately carries off the difeafe without any thing like the appearances which take place in the crifis of a fever, but that the fever fimply ceafes. If it be fuch an inflammation as produces no affection of the fyftem, as external inflammations often do not, then the fymptoms of the inflammation in the part affected with it only continue. If the inflammation be fuch as produces frequency of pulfe, heat, and other general affections of the fyftem, though it fhould arife from fever, if it arofe from any other caufe than fever, the frequency of the pulfe, and other fymptoms, will be the fame as if it had not arifen from fever, and continue although the fever be cured, and fubfide when the inflammation is carried off by means which would not affect the fever. Thus fuppofe in the fecond day of fever a pleurify

fhould

ſhould ariſe and cure the fever, although the fever be carried off, there remains frequency of the pulſe, foulneſs and dryneſs of the tongue, loſs of appetite, great heat, urine remaining tranſparent when it has ſtood for ſeveral hours, &c. Theſe appearances do not in the leaſt conſtitute fever, but entirely depend on the pleuriſy; and if the pleuriſy be cured by bleeding, for example, all theſe appearances ſubſide, although the bleeding would have had no effect on the fever, or carried off any of its ſymptoms, if the pleuriſy had not firſt ariſen, cured the fever, and produced theſe ſymptoms.

The knowledge that fever might be cured by exciting inflammation in ſome part of the body, may poſſibly be derived from phyſi-cians obſerving that a fever was actually cured in many inſtances, when an inflamma-tion aroſe in ſome part of the body, even when no application, as far as the phyſicians could judge, was applied to excite that inflamma-tion. The phyſician might think, there-fore, that by applying ſomething that would produce an inflammation in ſome part of the

body,

body, the difeafe might be carried off, and that an inflammation produced by any means might have the fame effect with that which had arifen in the fever itfelf, without any apparent caufe excepting the fever. He might therefore produce an inflammation in fome part of the body by ftimulating it with a view of carrying off the fever.

Perhaps rather that ftrong difpofition in mankind not to wait the tracing of know-ledge by experiment might make phyfi-cians fuppofe, that the fever depended upon fome noxious matter being diffufed through the whole fyftem, and that the application made might draw like a magnet that noxious matter into one part of the body, and pro-duce an inflammation in that part inftead of a fever in the whole.

It is ftill the opinion of many practiti-oners, that when an inflammation carries off a fever, if it be fuch an inflammation as tends to terminate in fuppuration, the matter that occafions the fever in the whole fyftem is accumulated in the inflamed part.
When

When the abfcefs is formed and breaks, and the pus is evacuated, many practitioners ftill believe that the matter which firft produced the fever is evacuated. Other inflammations, fuch as arife in the fkin for example, do not terminate in fuppuration, but in a blifter rifing, that is the fcarf-fkin feparates from the true fkin, and contains in it principally the fuperfluous water and the neutral falts of the blood, fometimes along with a little ferum, and fometimes alfo coagulable lymph, which coagulates and gives fome degree of folidity to the matter contained in the blifter. The fcarf-fkin afterwards breaks, and leaves the fkin excoriated till a new fcarf-fkin is formed ; until that happens a quantity of the fuperfluous water of the blood, together with the neutral falts, flow out. In this cafe it has been fuppofed that the fluids, or whatever other matter it might be that occafioned the fever, continues to be evacuated, and that fo the fever is carried off.

The objections to this opinion are very ftrong : firft, the author in his firft differtation upon this fubject, has endeavoured

to

to fhew that a fever is a difeafe of the living folids only, and that all the matter of the body, during the progrefs of many fevers, had exactly the fame properties as if the patient were in perfect health.

In the fecond place, fuppofing there was any matter exifting in the body which occafioned the fever, that matter muft either be confined to fome particular part of the body, or circulated in the blood veffels, or be thrown out by the exhalants and taken up by the abforbents, and fo circulated. In the firft cafe, if it was lodged in any particular part of the body, an inflammation in another part might excite the action of the abforbents of the part where the noxious matter was lodged, fo as to occafion it to be taken up and carried into the general circulation. If they did not take it up, it would remain in the part where it was at firft depofited, and where it produced the fever, and fo the inflammation which carried off the fever could not poffibly occafion matter to be brought to the inflamed part, as is evident to every perfon tolerably acquainted with the anatomy of the human body

as

as it is now known. To bring the matter
from a particular part where it produced
the fever, into a part whofe inflammation
cured the fever, it is neceffary that it fhould
be abforbed, and carried into the general cir-
culation. Suppofing the matter to be abforbed
and carried into the general circulation; or
fuppofing it is originally blended with the
whole fluids in circulation, fo as to occafion
the fever, the fame argument will apply,
and is as follows.

If any matter be in general circulation, it
is mixed minutely with the whole blood.
If it paffes through the blood-veffels
only, or if it paffes alfo through the exha-
lant, into the cavities and abforbents, in both
cafes it is mixed with the whole blood re-
turning from every part of the body, in the
right auricle of the heart. The motion
which takes place from the right auricle to
the right ventricle, mixes it ftill more tho-
roughly with the whole blood. It is ftill
more perfectly intermingled with the whole
of the fluids in paffing through the lungs,
and again in the left auricle and left ven-
tricle, fo that it muft be blended moft per-
fectly, and moft minutely in the aorta, fo

intimately

intimately as to be equally diftributed through all the veffels. It paffes through them with fuch velocity that no difference of fpecific gravity can prevent its being equally diftributed to every part of the body. If then there be no particular ftructure in any part of the body by which fuch matter may be caught, it will circulate equally through the whole body.

If there was any ftructure in any part of the body in its ordinary ftate, by which the matter of a fever could be caught, and would produce inflammation, then it would be the inflammation of that part only which would carry off fever. But the inflammation of any part of the body indifcriminately, in many inftances, carries off fever, and therefore there muft be a change in the ftructure of the part in which the inflammation arifes, in order to account for the matter's being caught in that part, no fuch change has been fhewn by any experiment, nor any caufe of fuch change, fo that we have an unknown thing, endeavoured to be accounted for by a thing equally unknown,

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We muft therefore fimply conclude, that an inflammation arifing in any part of the body without any apparent caufe, excepting the fever itfelf, in many cafes terminates the fever. How, or why this happens, is not as yet invefligated; we are only led from this fact to enquire, whether inflammations excited by certain caufes which produce that effect may not be employed to carry off a fever, as well as thofe which arife without any apparent caufe.

The author has feen in feveral inftances inflammation, produced by applying ftimulants to a part of the body, when a patient is affected with fever, carry off the fever entirely in the fpace of twenty-four hours.

When an inflammation is excited in the exterior parts of the body, fo as to carry off a fever, it does not produce appearances fimilar to thofe which take place in the ordinary crifis of fever; but the fever fimply ceafes, the head-ach goes off, the tongue becomes clean, depreffion of ftrength leaves the patient, all the evacuations come

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into their ordinary ftate as in health, the patient fleeps, and has his appetite re-ftored.

Though an inflammation produced in any exterior part of the body now and then carries off fever entirely, yet it has but fel-dom this effect; it only commonly alleviates the difeafe, or takes off fome of the fymp-toms; it fometimes carries off head-ach or diminifhes it; it diminifhes, rarely carries off delirium entirely if it has arifen; and fo of the other appearances which take place in fever.

Since exciting an inflammation fometimes alleviates and carries off the fymptoms of fever from particular parts of the body, if it fhould happen that one part of the body fhould be more affected in the fever than the other parts, an inflammation excited near that part is more apt to carry off the particular affection of that part, than one excited at a diftance. If, for inftance, there fhould be great pain in the forehead, an in-flammation excited behind the ears is more

3   apt

apt to carry off that pain, than if it had been excited in the back ; if there fhould be great affection of the breaft, an inflammation excited in the fkin of the breaft will be more apt to relieve the breaft, than if it had been excited in the extremities.

There are feveral fubftances which, when applied to the fkin, will excite inflammation, viz. muftard feed bruifed, horfe-radifh, and many other of the clafs tetradynamia of Linnæus ; many of the fpecies of allium ; euphorbium, and other refinous fubftances ; as well as cantharides, ammonia, and many others. Of thefe modern practitioners have generally chofen to employ cantharides to excite inflammation in fever, fometimes muftard feed.

If cantharides be powdered, and mixed with an oily or watery fubftance, and applied to the fkin, they excite an inflammation in the fkin ; this is followed by a blifter, in which the fcarf-fkin is raifed from the true fkin, fo as to contain in it a watery fluid. When the fcarf-fkin is broke, this

fluid

fluid flows out, and the fame kind of fluid continues to ooze out from the ſkin for ſome time afterwards.

Upon examining this fluid the author has found it to contain water, in which is diſſolved natron muriatum, ammonia muriata, and ammonia phoſphorata, with a little mucilaginous matter, ſometimes ſerum. The fluid oozed out therefore contains the ſuperfluous water, together with the neutral ſalts commonly contained in the blood-veſſels and the putreſcent mucilage. Nothing, therefore, which is not commonly contained in the blood-veſſels of a man in health, is found in this fluid, but the ſuperfluous water, neutral ſalts, or putreſcent mucilage of the blood, were never known to occaſion fever in a man in health. There is therefore no reaſon to ſuppoſe, that it is this particular fluid which occaſioned the fever, or that this evacuation is of any conſequence; it is not in ſufficient quantity to weaken the patient. The whole effect, therefore, of the application of cantharides, in as far as they produce this evacuation, muſt be

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confidered as of no confequence; it is the inflammation only which carries off the fever or its fymptoms.

The juice of cantharides is often abforbed by the veffels of the fkin, and carried into the general circulation of the blood, as is evident from its ftimulating and occafioning inflammation of the neck of the bladder, when cantharides are applied to the fkin, fo as to inflame it.

Some have been of opinion that the juice of the cantharides fo abforbed produced fome effect upon the matter which occafioned and kept up the fever : fuch opinion, however, is not founded on any experiment. That there is any peculiar matter in the body keeping up a fever has not been fhewn by any experiment, much lefs has it been fhewn that the juice of the cantharides has any effect upon fuch matter. This opinion, therefore, refting upon nothing more than an idle dream, it cannot be made a foundation for any medical practice.

Many

Many animal poifons abforbed, and carried into the fyftem by their action on the irritable parts, occafion fpafms or involuntary contractions of the moving parts of the body. The fame effect is alfo now and then produced by the juice of cantharides, when it is abforbed and carried into the fyftem. The author has, in feveral inftances, feen fubfultus tendinum, in women efpecially, and alfo more violent fpafmodic affections, arife from the application of blifters in fever as well as in other difeafes; the abforption, therefore, of the juice of cantharides, when it has this effect, fo far from being ufeful, is evidently hurtful. But this does not happen often enough to prevent cantharides being ufed.

Cantharides are therefore better employed to excite inflammation with a view to carry off or alleviate fever, than other ftimuli, as they moft readily produce inflammation, the inflammation produced by them is carried off the eafieft, and is more readily kept up if that fhould be wifhed; though fometimes the abforption of their juice pro-

duces

duces fpafmodic affections, which occurs but rarely, and foon go off, if the cantharides are no longer applied, generally in lefs than twenty-four hours; though they are apt to produce ftrangury, which may be obviated or alleviated by employing mucilaginous medicines, fuch as gum arabic diffolved in barley water.

How thefe mucilaginous fubftances produce their effect, the author cannot fatisfy himfelf, but that they do produce the effect in many cafes is certain. The author has feveral times applied cantharides fo as to excite inflammation to more than forty patients running. To the one half of them he has given mucilaginous fubftances diffolved in water, and in the other half has not; many fewer of thofe patients who took the mucilaginous fubftances were affected with ftrangury, than of thofe to whom the mucilaginous medicines were not exhibited.

Some have preferred the application of muftard feed, or fome other of the clafs tetradynamia and genus allium, to

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the feet and legs in cafes of delirium in fever.

This practice feems to have arifen from the doctrine of derivation, viz. to derive the matter as far from the head as poffible, which is mere hypothefis. In practice it is found, that if any particular part of the body be afflicted with a difeafe, an inflammation produced in another part carries off the difeafe more certainly, if the inflammation is excited near the difeafed part, than if excited at a diftance. The proof of this, however, would be a digref-fion too long to be entered into here, more efpecially as he believes it is generally ac-knowledged.

Suppofe then that cantharides are prefer-red to excite inflammation in fever, the next queftion will be in what cafes fuch in-flammation fhould be produced.

Suppofing that a patient is feized with a re-gular continued fever, and that the practi-tioner had no other means of putting a ftop to the difeafe excepting by exciting an in-
                                    flammation ;

flammation; or fuppofing that he has employed preparations of antimony or other medicines already enumerated, without being able to induce a crifis in the fever; or even fuppofing that there were other means of inducing a crifis to the fever or carrying it off immediately without any critical fymptoms; and fuppofing the fever was perfectly regular and affected the whole fyftem equally, in any of thefe cafes it is often worth while to attempt to carry off or alleviate the fever, by exciting an inflammation, by means of cantharides in the fkin between and over the fcapulæ about fix inches fquare. If the fever fhould be carried off by this means, the inflammation may be fuffered to go off and the blifter to heal.

The circumftances being the fame, and the cantharides having been applied, and an inflammation produced, if the fever fhould not be carried off, nor in the leaft alleviated, the application of cantharides, or any other ftimulant to produce inflammation a fecond time, rarely relieves the difeafe, and therefore it is not worth while to keep up or re-

new

new the inflammation of that part or any other part of the body ; it will only wear out the fyftem, and give the patient a lefs chance of fuftaining the ordinary courfe of the difeafe

Suppofing the circumftances are the fame, and the difeafe is alleviated, but not carried off, it may be advifeable to excite a new inflammation after the firft is carried off. If this new inflammation fhould not carry off, or very much alleviate the whole difeafe, a third inflammation is not to be attempted. The conftant ftimulus kept up by the remedies employed to excite a third inflammation, and the inflammation itfelf, will wear out the patient fo much, that no probable advantage arifing from it can compenfate for the mifchief.

When a patient is going through the long progrefs of a fever, which takes up perhaps one and twenty days, or even longer, when no medicine has been tried or has been found capable of preventing it continuing its ordinary courfe, the practitioner,

and

and much more thofe about the patient, lofe their patience, and the latter wifh that the practitioner would exert himfelf, and do fomething efficacious. In this cafe, he is often compelled by thofe about the patient to apply cantharides to excite inflammation, notwithftanding the inflammation will probably be of no manner of ufe, but tend to wear out the patient. The relations and nurfe, and by-ftanders, are fatisfied with what they call a fine blifter, and the practitioner's doing fomething. This certainly ought to be no inducement to a practitioner to torment the patient with an additional difeafe, or to wear him out by producing additional action, and fo give him a lefs chance of going through the ordinary courfe of the difeafe.

It happens often that fome part of the body is more affected in fever, than in proportion to the affection of the fyftem generally. This forms an irregularity in fever; but not to have to recur to the excitement of inflammation again, the author means to notice it here.

Sometimes

Sometimes there is a much greater head-ach, that is, pain in the exterior part of the forehead, or all round the head, than in proportion to the febrile affection of the other parts of the fyftem. In this cafe, at the very beginning of the difeafe, cantharides applied behind the ears, fo as to excite inflammation, often relieves the head-ach, and fometimes carries off the whole fever. The fooner the inflammation is excited, the greater is its power, and therefore under fuch circumftances it is better to apply them fo as to excite inflammation and occafion a blifter, in the firft two or three days of the fever.

Sometimes delirium arifes earlier than we fhould expect from the other appearances of the difeafe. In this cafe, an inflammation produced by cantharides, fo as to occafion a blifter to arife on the head after removing the hair, or on the fkin of the neck, or between the fcapulæ, has fometimes confiderable effect in diminifhing, fometimes carries off the delirium, and even fometimes it carries off the whole difeafe.

Sometimes

Sometimes the breaft is more affected than in proportion to the appearances of fever in other parts of the body; there is for inftance fometimes a greater weight and oppreffion about the precordia, than for the appearances of fever in the other parts of the body; fometimes greater difficulty of refpiration, attended with cough; fometimes greater frequency of the pulfe. In all thefe cafes, when they arife from greater affection of the breaft, exciting an inflammation in the fkin over the fternum, has often given confiderable relief, fometimes has carried off the whole fever.

It is to be remarked in all thefe cafes of topical affection, that if the firft inflammation excited, or blifter produced, neither alleviates the appearances in the particular part of the body, nor diminifhes the whole fever, a fecond or third inflammation, excited by cantharides or otherwife, has feldom any beneficial effect, but tends to irritate the whole fyftem and wear out the patient, fo as to render him unable to be fupported through the remaining progrefs of the difeafe.

If

If the inflammation fo excited fhould have given confiderable relief, in that cafe keeping up the inflammation, or which is preferable, renewing it after it is gone off, is often ufeful.

In all cafes where inflammation is excited either to carry off the fever totally, or to alleviate the fymptoms when they have taken place in a greater proportion in one part than in the whole fyftem, the fooner it is excited, the more it is likely to prove efficacious, excepting there fhould be great hardnefs, fulnefs, and ftrength of the pulfe, and other appearances which would render evacuation by bleeding neceffary, but this is rarely the cafe. The practice, however, has rather been to leave the excitement of inflammation till later in the difeafe, with a view perhaps to the practitioner's having fomething to do to fatisfy the patient and bye-ftanders, rather than appear to allow the difeafe to go through its ordinary courfe.

It often happens that in the courfe of a regular continued fever delirium takes place.
This

This delirium has been defcribed in the former part of this differtation, as of two different kinds: the firft, in which there is no appearance of affection of the brain, either when the patient is alive, or upon diffection: the fecond, in which, when the patient is alive, there is fulnefs of the veffels of the eye, flufhing in the face, and on diffection the veffels of the brain are much fuller of blood than they are found to be in men killed by accidents, which have no effect upon the brain.

Both thefe fpecies of delirium generally begin towards the end of the firft week of the difeafe, but prevail principally in the fecond week. In the fecond fpecies, taking away blood by opening the external jugular vein, and letting five or fix ounces of blood flow out, has diminifhed the delirium confiderably, fometimes has carried it off entirely, and with it the whole fever. The fame effects have been produced by applying two, or three, or four leeches, and allowing them to fall off of themfelves, and afterwards applying cloths moiftened with

warm

warm water, and allowing the wounds to bleed for four or five hours. This laſt me- thod is more efficacious. In ſuch caſes of delirium, therefore, it is proper to take away a ſmall quantity of blood. The quantity of blood to be taken away ſhould be according to the ſtrength of the patient; if his ſtrength be much diminiſhed by the fever, or other- wiſe, the application of one leech to each temple is of conſiderable uſe.

Taking away blood from the arm, or any other part of the body diſtant from the head, is of no manner of uſe, as the author has ſeen in a great number of caſes. It was much the practice about the year 1760, to take away blood from the arm in caſes of delirium of both kinds, the practitioners be- lieving that delirium aroſe from inflamma- tion of the brain; but the author never ſaw any advantage ariſe from this practice.

In delirium of the firſt kind, where there does not appear any ſymptom of fulneſs of the veſſels of the brain, the author has not ſeen any advantage gained by taking away

blood

blood in any way from the head, or from any other part of the body.

At the beginning of fever, it happens sometimes that very violent pain takes place in the forehead, which feels to the patient as if it affected the integuments of the cranium, and were merely external. In this cafe the author has seen three or four leeches applied to the temples give confiderable relief to the patient by removing the pain, and sometimes they have carried off the whole fever.

The author cannot conceive in what way such evacuation from the veffels of the head should be of use, when taking away blood from a diftant part of the body is of none. Every man verfed in anatomy muft know, that from whatever part of the body blood is taken, it is the fame blood, excepting for the difference there is between arterial and venous blood, which are to be converted the one into the other in a few feconds.

The veffels of the exterior part of the head have very little connection with the

K.   veffels

veffels of the interior parts, fo that taking away blood from the temples by means of leeches can have very little influence on the circulation of the interior parts. The reafon why fuch topical evacuations by bleeding carry off or diminifh the delirium or pain in the forehead, or even fometimes the whole fever, is wholly unknown to the author. The only thing that he knows with regard to it is, that it is often effectual, which was long ago taught to him, and which he has found confirmed by repeated experience.

In this cafe, as well as in the application of all the remedies employed to carry off or relieve fever, the effect is uncertain. Sometimes this topical evacuation is of very great advantage, or evidently carries off the fever without occafioning any of the appearances which take place in the ordinary crifis of the difeafe, and not unfrequently it has no effect at all. As fo fmall an evacuation can hardly be of any difadvantage to the patient, it is worth while to employ it in the cafes which have been enumerated.

The

The moft confpicuous appearance, which takes place in the crifis of fever, is profufe fweating. Whatever fubftances, therefore, tend to produce profufe fweating fuggeft themfelves as remedies proper for carrying off the difeafe. Spices are among the fub-ftances which tend to occafion profufe fweat-ing, and have therefore been conceived to be proper remedies for carrying off the dif-eafe.

The great depreffion of ftrength, and great fenfe of coldnefs, which take place at the attack of fever, and when the coldnefs is gone off the great depreffion of ftrength which continues, fuggeft the propriety of employing fuch powerful ftimulants as pep-per, cinnamon, nutmegs, capficum, &c. to prevent the patient from finking under the difeafe.

The impreffion made by the appearance of weaknefs in the patient, and by feeing the fever carried off by a crifis in which profufe fweating takes place, has determin-ed all nations in the beginning of medicine

to

to employ fuch powerful ftimulants as the
fpices enumerated, or the moft powerful
they could procure, to produce a crifis;
practitioners have alfo employed them to
fupport the ftrength of the patient. It is
not till medicine has fubfifted for a long
time in any country which has had no com-
munication with others, or until the prac-
tice of other nations who have had much
longer experience in medicine has been com-
municated to them, that fuch ftimulants
have been thrown afide, or the cool regimen,
as it has been called, has come into prac-
tice.

It is moreover to be obferved, that many
practitioners in medicine have been nearly
or totally without that education, which
could teach them the knowledge of the ex-
perience of thofe practitioners who went be-
fore them, and in confequence on what
ground the practice of medicine is founded.
Unfortunately, in all the fchools of medi-
cine, the profeffors have been more anxious
to infufe into the minds of their pupils fome
hypothefis, rather than a true hiftory of the
<div align="right">difeafes</div>

difeafes they have treated of, or the efficacy of the remedies which have been employ-ed.

It is not therefore at all to be wondered at, that the application of fpices, and other powerful ftimulants, fhould often be re-in-troduced. The fame depreffion of ftrength, which originally brought fpices and other fuch ftimulants into practice, and the pro-fufe fweating which takes place in the crifis of the difeafe, have made untaught and un-experienced practitioners fall into the fame train of thought, and the fame practice that prevailed in the rude ftate of medicine, that is, to keep up the force of the patient, or to bring on fweating, fuppofing by that means to occafion a crifis in the fever. This is called the warm regimen, and has been thus brought forward repeatedly.

For the fame purpofe the patient has been kept in an air of a very warm temperature, and covered with bed-clothes that are bad conductors of heat, and with the fame ef-fect.

K 3

It

It has been already fhewn, that ftimulating the body when there is depreffion of ftrength, but not actual weaknefs, is a means of exhaufting the powers of the fyftem inftead of increafing them. It remains to be enquired whether fweating, produced by fimple ftimulants, or keeping the patient in a warm atmofphere, or loaded with clothes, will produce a crifis or carry off the difeafe.

Sweating alone does certainly not carry off a regular continued fever. Every practitioner, who has feen a moderate number of patients afflicted with regular continued fevers, muft have obferved fweating frequently take place without carrying off, or even producing the fmalleft alleviation of the difeafe.

In the crifis of fever, there is not fweating alone, but a univerfal increafe of the fecretions. The tongue becomes moift, the cruft covering it is exfoliated; a laxity takes place in the inteftines, fometimes a confiderable purging; the fkin regains its healthy

healthy appearance, and is no longer con-
tracted upon the mufcles; a relaxation
every where takes place. None of thefe
other appearances happen when fweating is
produced by ftimulants, or keeping the pa-
tient in a warm atmofphere, or covered with
clothes, non-conductors of heat : on the
contrary, the mouth becomes more parched
and drier, and the thirft is increafed; the
inteftinal canal is more conftipated; the pa-
tient is far from being relieved from any
part of the difeafe.

If therefore the attempt to carry off the
difeafe by ftimulating by means of the re-
medies enumerated, or keeping the patient
hot, is viewed in any light, it is to be
totally rejected.

It happens not uncommonly in the human
body, that a mufcle contracts without any
volition in the man, or even againft and
contrary to his will, and when there is no
apparent ftimulus applied either to the part
itfelf, or to any other part of the fyftem.
Although this contraction is often, in a

K 4   very

very great degree, yet the two ends of the
mufcle cannot be brought nearer each other,
becaufe it is counteracted : in this cafe the
body of the mufcle generally fwells, and
occafions pain to a violent degree. This
contraction has been called fpafm.

This kind of contraction takes place not
only where there are evident mufcular fibres
of a red colour, but in all the other parts of
the body which have a power of contrac-
tion fimilar to mufcular contraction, and not
at all depending on their elafticity. For
example, the gaftrocnemii mufcles of the
leg contract without any volition or againft
the volition, and without any ftimulus be-
ing applied; the belly of the mufcles
fwells, and is extremely painful; fo in like
manner the fkin contracts upon the interior
parts, and produces an uneafy or painful
fenfation without the patient's volition, and
when no apparent ftimulus is applied.

That there is fome caufe for fuch contrac-
tion taking place there can be no doubt,
but it is a caufe that is imperceptible.

Such

Such contractions are called fpafm, pro-
perly and ftrictly fpeaking. Contractions
which arife from ftimuli, applied either to
the part itfelf or to fome other part of the
body or from affections of the mind, have
been called in a vague fenfe fpafms likewife.

The contractions which, ftrictly fpeak-
ing, are called fpafms, fometimes laft for a
very fhort time, not above a minute or two,
and then go off; fometimes they continue
for a more confiderable length of time, and
produce affections of the fyftem which have
been fatal. The fpafm of the mufcles of
the leg for inftance, which is called the
cramp, does not laft above a minute or two;
it goes off, leaving a degree of forenefs be-
hind. A fpafm of the annular mufcular
fibres of the inteftines continues for two or
three days; it produces extreme pain in the
part, and a more frequent contraction of
the heart, and in confequence more fre-
quent pulfation of the arteries, fo that they
often beat more than one hundred and
twenty times in a minute. A great depref-
fion of ftrength in the whole fyftem comes
on,

on, a lofs of appetite, difficulty of refpiration, and derangement of all the other functions of the fyftem take place; fometimes the effects prove fatal in a few days, or even hours.

It has already been fhewn, that in fever there is contraction of the parts which have mufcular power generally, and that fever often arifes from caufes perfectly unknown. Here is, therefore, a contraction in certain points fimilar to what is called fpafm; fome practitioners have, therefore, confidered fever as a fpafmodic difeafe, and the whole of it as confifting entirely of a fpafmodic contraction of all the parts of the body which have a power of mufcular contraction totally independent of their elafticity.

It is to be remarked, however, that contractions of the various moving parts is but a part of the difeafe; there is, befides this contraction, a depreffion of the powers of the body. This arifes even before there is any appearance of contraction, and in many cafes it is by no means in proportion either

to

to the degree or univerfality of the con-
traction. This depreffion continues in
many inftances when the contraction in
many parts of the body is gone off. There is
likewife a regularity in the attacks, hot fits,
and crifis of the difeafe, not at all fimilar
to what happens in thofe contractions which
are called fpafmodic, thefe being almoft al-
ways vague and irregular.

There are certain remedies which, being
applied to the ftomach or fkin, or fome
other parts of the body of a patient affect-
ed with fpafmodic contractions, in many
inftances will immediately carry off the
fpafm. In a fpafmodic contraction of the
mufcles of the calf of the leg, æther pour-
ed upon the fkin of the leg will, in fome
cafes, immediately carry off the contrac-
tion.

It is to be remarked with regard to thefe
medicines, that they have fomething pecu-
liar in tafte and fmell, which we have not
fufficient words to exprefs; indeed we
have few words to exprefs the fenfations
which

which we receive from the tafte and fmell. Thefe fenfations are at leaft, at firft, what we call fetid to the fmell; their particular odor has given a diftinction to thefe remedies.

Thofe which we commonly call antifpafmodic, are fome plants of the natural clafs of ringent flowers, by Linnæus, called didynamia gymnofpermia, fuch as mentha pulegium, &c. Some of the natural clafs of umbelliferous plants, which come under the pentandria digynea of Linnæus, as ferulla affafœtida, &c. fome plants which have compound flowers, moft of which are contained in the fyngenefia of Linnæus, as matricaria, &c.; fome medicines, the product of chemical proceffes, fuch as æther, &c.; fome found in animals, as mufk, &c. Moft of thefe have been ufed to take off fpafmodic affections, and feveral of them have been ufed in fever, with a view of taking off fever immediately, or gradually diminifhing the difeafe.

It

It has been already faid, that æther and oleum vini, diffolved in alcohol, fometimes produce fleep, in which fleep a crifis of the fever now and then takes place, and the difeafe is entirely carried off; but this has been fufficiently treated of in the firft part of this differtation.

Refinous fubftances, fuch as galbanum, fagapenum, oppoponax, &c. have fometimes been made ufe of, but rather as laxatives, than with a view of carrying off the difeafe. Affafœtida, gum ammoniac, procured from the fame clafs of umbelliferous plants, though they have been much employed as antifpafmodics in other difeafes, yet as far as has come to the knowledge of the author, they have not been made ufe of with a view of carrying off or diminifhing fever.

Mufk has been employed, in many cafes, towards the end of a regular fever, where the ftrength has been much diminifhed, with a view however rather of ftimulating and keeping up the ftrength of the patient, than

as

as a medicine applicable to the carrying off or alleviating the fever itfelf: it certainly, as far as the author can judge from frequent experience, has been of little ufe in either fupporting the ftrength or alleviating the difeafe.

Caftor has been employed in many inftances, but efpecially along with fmall dofes of opium, as has been defcribed in the former part of this differtation. The author thinks he can fay, from his experience, this has been done with very confiderable advantage in affifting the opium in producing a degree of ftupor and fleep, fo as confiderably to alleviate the difeafe.

Camphor, a very peculiar fubftance, produced by the cryftallization of the effential oil of the laurus camphorifera, and found often in cavities formed by the cracking of the tree itfelf, has been very much ufed, particularly in the fecond and third weeks of a regular continued fever.

This fubftance has been fo much and fo univerfally employed by the very firft practitioners

tioners in medicine, by thofe of the greateft
fkill as well as of reputation, that the au-
thor's practice can be put in no competition
with their opinion. There are many things,
however, that make him dubious of its effi-
cacy, either in alleviating or carrying off
the difeafe. In the firft place, he has fre-
quently employed and omitted it throughout
the fecond and third weeks of a regular
continued fever, in fimilar cafes, without
obferving that the fever was more alleviated
in the patients who made ufe of the cam-
phor, than it was in thofe patients who did
not make ufe of it.

In the fecond place, the dofe which has
been commonly employed in what is called
the camphor mixture, cannot poffibly
amount to two grains, whereas the author
has frequently exhibited to patients in regu-
lar continued fevers upwards of ten grains,
and to patients in other difeafes twenty,
forty, and even fixty grains of camphor,
without producing in moft cafes any fenfible
effect. Sometimes indeed when given in the
quantity of thirty grains and upwards, it
has occafioned a little giddinefs and ftupor,

3   which

which however have foon gone off. He does not think, therefore, that in fo fmall a dofe it can be very efficacious.

Again, in a fever which is running on for two or three weeks, and in which no efficacious medicines have been employed with fuccefs, but the difeafe has gone on in its ordinary courfe, the flavour of camphor gives the appearance of the practitioner's doing fomething efficacious, or at leaft attempting to do fomething while he is regarding the progrefs of a fever purfuing its ordinary courfe. It is wearifome to the patient, as well as to the bye-ftanders and to the practitioner, to conceive that no remedy having any efficacy can be exhibited. This, the author fufpects, has been the caufe that camphor has been exhibited; its flavour, however, often difagrees with the patient's ftomach, and produces ficknefs or naufea that prevents him from ufing food of fufficient nourifhment.

The author has all along confidered a regular continued fever to be fimilar to a regular

gular intermittent, confifting of ephemeræ
following after each other at certain periods
of time. He has faid that the difference
between an ephemera and an intermittent is,
that an ephemera confifts of one attack of
fever only, while a regular intermittent con-
fifts of feveral paroxyfms of fever following
after one another, one paroxyfm going
off entirely, before the next paroxyfm begins
to take place, and the patient appearing
in the intervals of the paroxyfms nearly or
entirely in perfect health, as far as is fenfi-
ble to the practitioner or the patient.

He has alfo faid, that the bark of the
cinchona being exhibited during the interval
between the paroxyfms of a regular inter-
mittent, has a power of preventing a frefh
paroxyfm from making its appearance, fo
that the patient fhall continue in perfect
health. He has faid alfo, that the difference
between a regular intermittent and a re-
gular continued fever is, that the pa-
roxyfms of the intermittent are terminated
by crifis, but that in a continued fever a
new acceffion takes place before the crifis of

L   the

the former paroxyfm begins. If it be true then that a regular continued fever differs only from a regular intermittent in the paroxyfm of the continued fever not having reached the period of a crifis before a new paroxyfm takes place, it might be fuppofed that if a fufficient quantity of the bark of the cinchona was exhibited during a previous paroxyfm of the fever, that it would prevent the next paroxyfm from taking place, and give time for the prefent paroxyfm to reach its crifis, or gradually fubfide.

This reafoning is fo obvious, that many practitioners have given large dofes of the bark of the cinchona with a view of preventing another paroxyfm from taking place in a regular continued fever, and fo carrying off the difeafe. Many practitioners have likewife exhibited it, without any other reafon than that if the bark of the cinchona cures an intermittent fever, it ought alfo to cure a continued fever. Both thefe fets of practitioners have employed the bark of the cinchona in powder to the quantity of one, two, or three ounces in twenty-

four

four hours, and in feveral inftances with fuccefs. The fever in this cafe fometimes has been carried off with an evident crifis, happening later than the crifis of the paroxyfm in which it was given would have taken place, and the fever has not returned, or the fymptoms have gradually difappeared in lefs than forty-eight hours, and the patient has been reftored to health.

When a young practitioner has fucceeded with any medicine in carrying off a difeafe once, he always expects to fucceed; as Sydenham obferves of himfelf when he employed the juice of the fpina cervina in dropfy. In like manner, the exhibition of the bark of the cinchona having fucceeded in fome cafes in carrying off a continued fever, thefe practitioners have been warm in their recommendation of it in all cafes of the difeafe; after a little time, however, moft of them have left off the practice, finding it far from fucceeding always. If it had even fucceeded fometimes, without any detriment to the patient, they would not have been prevented from employing it, efpecially

L 2   when

when they had committed themfelves by teftifying its efficacy in the ftrongeft terms.

The author has feen many cafes in which it has been employed in a regular continued fever, fometimes with fuccefs, but it has much oftener failed of fuccefs. Where it has failed, the relaxations which began to take place in the difeafe have been much diminiflied, the pulfe has become more frequent in the morning, the head-ach more confiderable, the fkin drier, the tongue covered with a thicker fur, the coftivenefs greater, if the patient was not thrown into a purging, the oppreffion upon the precordia greater, and likewife the difficulty of refpiration increafed. On the following evening the head has alfo been much more affected, that is, the confufion and delirium have been much more confiderable, and the patient altogether worfe than he probably would have been if no remedy whatever had been exhibited, and there has been lefs chance of crifis in the fever, and it has been longer of being worn out.

In

In a regular continued fever, therefore, the bark of the cinchona feems to have a greater chance of doing mifchief than good, if it be employed in large dofes, fo as to attempt to carry off the difeafe at once. In certain irregularities of continued fever, it may be advifeable to employ it with a view of preventing the fubfequent attacks of the difeafe, or in fmaller dofes, fo as to fupport the ftrength of the patient, but thefe confiderations will be the fubject of a future differtation.

The author has now enumerated the feveral claffes of medicines which have been employed to terminate a fever fooner than it would be terminated in its ordinary progrefs, or alleviate the difeafe, fo that it fhall go through its progrefs with lefs danger to the patient, by rendering the fymptoms lefs violent, excepting fome few which he hardly thinks worthy of notice. Small dofes of ceruffa acetata were employed by Gaubius, and other medicines have been recommended by other phyficians, which have never, as far as the author

L 3   knows,

knows, come into general practice in any country, or have been ufeful.

The author has now pointed out the appearances which take place at the beginning of a continued fever, fhewn thofe that take place during the courfe of the difeafe, at what time, and how they take place, and how they continue until the difeafe deftroys the patient, goes off by crifis, or wears itfelf gradually out. He has alfo endeavoured to point out what attentions are to be paid to the patient on leaving the difeafe to purfue its ordinary courfe. He has alfo endeavoured to fhew thofe means which have been employed to fhorten the difeafe, fo as to reftore the patient to his priftine health, without leaving it to terminate itfelf by a crifis, or wear itfelf out.

One thing, however, is ftill left. The author has faid, that in a regular continued fever there is always depreffion of ftrength, and that depreffion of ftrength fometimes rifes to fuch a degree as to occafion putrefaction of the fluids. This is certainly not the cafe in the greateft number of regular continued

nued fevers, and does not happen perhaps once in an hundred cafes of the difeafe in all its forms and varieties. The author, however, could not pafs over this fymptom in defcribing regular continued fever, becaufe, according to his opinion, this appearance of putrefaction always depends upon depreffion of ftrength; he therefore has defcribed the appearance of putrefaction, and fhewn that if it did take place, it endangered the life of the patient in the manner which has already been pointed out.

As therefore fymptoms of putrefaction have been defcribed as taking place from depreffion of ftrength, a conftant part of fever, and when this depreffion of ftrength takes place in fuch a degree as to produce putrefaction of the fluids, the putrefaction endangers the life of the patient, it is neceffary to enquire what means may be employed to prevent or remove this fymptom, or counteract it fo as to preferve the life of the patient.

All animal folids and fluids, which are employed for any of the purpofes of life,

L 4   confift

confift of a folid fubftance combined with water. This folid fubftance the author has called by the generic term of animal mucilage; and this acceptation of the term mucilage has now, at leaft in this country, Great Britain, been almoft generally adopted.

There are fluids contained in animals, which have either no mucilage in them, or fuch a fmall quantity, as to be in no proportion worth attending to, not in the quantity of an hundredth part of the whole. Thefe, however, are all excrementitious fluids which are no longer ufeful, and which are in their way to be evacuated.

The mucilages which form the folids and fluids along with water, which are employed in the living body, have various properties.

Some combine with water fo as to form folids, fuch as the mucilage of the membranes, fibres, and cartilages of the body; fome combine with water fo as to form fluids, fuch as the mucilage of the ferum,

coagulable

coagulable lymph, bile, &c.; fome are perfectly colourlefs, infipid, and inodorous, fuch as the true fkin, the ferum, &c.; fome are coloured, fuch as the mucilage of the bile, which is yellow, and the mucilage of the red particles of the blood, which is red; fome have a tafte, as the mucilage of the bile has a bitter tafte. All thefe properties remain perfect while the different mucilages are performing their offices in a living body.

If any of thefe mucilages be taken out of the living body of an animal, and allowed to die inftead of retaining the properties that they had while in the body and alive, in a fhort time thefe properties are by degrees altered and loft, and the matter of thefe mucilages acquires new properties totally different from thofe that they had during the time that they formed a part of the living body.

When either a folid or a fluid is taken out of a living body, there are feveral circumftances to which it is expofed which are different from thofe from which it was in

when

when it was in the body of a living animal, befides that it can no longer now be confidered as alive. It may then be owing to fome of thefe circumftances in which the animal mucilage is placed, when out of the living body, independent of its lofing its life, that fuch change in its properties may arife. It is therefore to be enquired, whether thefe changes which take place in the properties of an animal mucilage, when taken out of the body and deprived of life, arife from its being merely deprived of life, or from the other new circumftances into which it is put.

Certain animal mucilages, on being deprived of life, lofe many of their properties which they had when they were alive, as foon as the life ceafes in them. All the folid parts of an animal which are capable of contracting, fo as to become fhorter than they would be if they were not alive, are conftantly contracted to a greater degree when alive, than they would contract from their elafticity. This contraction ceafes when they are dead; they are always, therefore, longer in a dead body than in a living body, even when they retain all their chemical

mical properties; (that is to fay, the properties that diftinguifh them from any other fpecies of matter) as well as their mechanical properties. This propofition admits, however, of fome abatement; a folid, capable of contraction when an animal is alive, and exerting that power of contraction fo as to become fhorter, requires a greater force to break it, than if it was not to exert its power of contraction; for it contracts by its particles coming nearer one another in the direction in which it contracts, but it breaks by its particles going to a greater diftance from each other in the fame direction; but particles cannot come nearer each other in one direction, and go to a greater diftance from each other in the fame direction in the fame inftant of time; therefore the power which the particles exert in coming nearer each other, in confequence of being alive, will refift any power which endeavours to draw them to a diftance from each other whatever it may be, or in other words, a living moving part, by its conftant contraction depending upon life, will refift any mechanical power which attempts to break it.

As

As thus the mechanical properties of a living folid differ in fome refpects from thofe of the fame folid immediately upon its death, fo likewife the chemical properties of living folids or fluids, confidered as alive, or as acted upon by the living folids contained in them, differ from the chemical properties that they have immediately upon their death. If a certain quantity of kali purum, a fcruple for inftance, be applied to any living folid in the body, it will unite with a certain quantity of the mucilage of the folids, and form a faponaceous fubftance, perhaps half a dram; if the fame quantity of pure kali be applied to the fame folid juft when it has loft its life, it will unite with a much larger quantity, perhaps a drachm; it will therefore combine with a larger quantity in the dead than in the living body.

The mucilage of the coagulable lymph, contained in the blood-veffels, is either alive itfelf when fo contained, or acted upon by the living blood-veffels, and is in confequence perfectly foluble in water; if it be

extravafated

extravafated into any cavity of the body, or if it be thrown from the blood-veffels out of the body, although in all other fenfible circumftances it be in the fame fituation as it was in when it was contained in the blood-veffels, it becomes infoluble in water, feparates from the water in which it was before diffolved and becomes folid, or, according to the ordinary term, coagulates.

It is not therefore ftrictly true, that the folids and fluids of a living body retain exactly the mechanical and chemical properties which they had when alive the inftant they die. There are fome proceffes which do not go on in animal mucilages when alive, in whatever circumftances they are, which go on under the fame chemical circumftances when the fame animal mucilage is dead.

When an animal mucilage is alive, it continues fluid or foluble in water, or not foluble in water, fo as to form a fluid or a folid with the water with which it is combined, of an equal degree of foftnefs or firmnefs if it be a folid, and with an equal

degree

degree of adhefivenefs or limpidnefs. If it be a fluid; it continues of the fame colour, tafte and fmell. The moment that it dies, it lofes thofe mechanical and chemical properties; a mucilage, therefore, is not acted upon by the fame mechanical and chemical laws when alive, as when it is dead.

As foon as an animal mucilage dies, it becomes fubject to various chemical changes, when put under certain circumftances, to which it was not fubject when alive. One of thefe proceffes is known by the name of putrefaction. If a dead animal mucilage combined with water, fo as to form a flexible folid, is placed in a heat between 45 and 150 degrees of Fahrenheit's thermometer, putrefaction begins to take place; this happens moft readily in a heat of about an hundred degrees, if the mafs be moderately expofed to the air of the atmofphere, and particularly that part of it which is called pure or refpirable air.

The appearances which take place in a dead folid under thefe circumftances are, that
the

the whole of it lofes its firmnefs, that is, it is pulled to pieces with lefs external force; it feels more clammy to the touch, and if it be wafhed with water heated to about fifty or fixty degrees, a part of it diffolves in that water.

If it be the red particles of the blood, they become of a darker red colour after ftanding for fome time, and upon examining them with a microfcope, fome of them appear broke into two, and look like half moons, and fometimes into feveral pieces like other fections of a fphere, and fome appear ftill fpherical, but of lefs diameter, and by degrees diffolve in the ferum, giving it a reddifh colour. They likewife redden the mucilage of the coagulable lymph. If the coagulable lymph be extravafated, or remains in the large veffels of animals after they are dead, it coagulates into a very firm fubftance, which by putrefaction becomes eafier to break down, has a clammy feel, and part of it is rendered foluble in water, fo as to form a fluid. The mucilage of the ferum which, when it is taken out of the

living

living body coagulates, if heated to one
hundred and fixty-five degrees, into a firm
folid mafs, when it undergoes this pro-
cefs, if heated to that degree, it coagulates
into a loofer mafs, and fome of it not at all.
Similar changes take place in the other mu-
cilages of the body when putrefaction juft
begins.

In like manner, the other fluids of the
body lofe the properties which they had be-
fore putrefaction began.

If the putrefaction continues, the changes
which take place do not happen in the whole
matter which is to putrify at once. In the
firft ftage, the whole of a folid fibre does
not at once become foluble in water, fo as
to form a fluid, but part of it becomes fo-
luble in water, and the other part remains
without changing its properties in the leaft.
In like manner, the whole of the red parti-
cles of the blood are not broke down into
fmaller particles, but fome of them remain
quite perfect, and have that form they had
when taken from the animal in perfect health,

whatever

whatever that form may be, for their form has been difputed, and has not been agreed upon; in like manner part of the coagulable lymph coagulates perfectly, and another part of it does not coagulate upon extravafation. The ferum likewife, in part, coagulates by heat as firmly as if no change has taken place in it, while another part does not coagulate at all. The mixture of the folid fibres, which are become foluble in water, with that part of them which has not changed fo as to become foluble in water, being perfectly uniform, gives foftnefs to the whole mafs. Thus a portion of all thefe fubftances putrify at the beginning of the procefs, and another portion remains as perfect as it was before.

What has been above obferved, is fimilar to what happens in all fermentations.

When a fermentation begins to take place, it does not take place in the whole mafs at once, but in a certain part of it only, in which part a change inftantly takes place; while in the other parts, no change whatever has

M   happened.

happened. For example; if we have an hundred of the fmalleft integral parts of fugar diffolved in water, and place them in circumftances in which the vinous fermentation arifes, at the firft inftant of the fermentation one of the particles of fugar is converted into wine, and the other ninety-nine particles remain fugar the fame as before any fermentation took place; or, in the firft inftant of the fermentation, two. or more of the particles of fugar may be converted into wine, while the remaining particles of fugar continue the fame fugar they were before.

Suppofing that the firft of thefe fuppofitions fhould be the cafe, in the fecond inftant of the fermentation, two of the particles of fugar will be converted into wine, and ninety-eight will remain perfectly in the form of fugar, and fo by degrees the whole fugar will be converted into wine when the fermentation is finifhed, but during the progrefs of it there will be a certain quantity of fugar, and another quantity of pure wine.

This

This is proved by taking the mafs of mixture of fugar and wine, at any time during the progrefs of fermentation, diftilling it until the whole alcohol is carried over. Afterwards feparate the alcohol from the water fo as to render it pure, and meafure or weigh it. To the liquor remaining in the ftill, add a little quicklime, and mix a portion of whites of eggs; then expofe the mafs to a degree of heat fufficient to coagulate the whites of eggs; throw the whole through a filter; evaporate and cryftallize; the fugar in it will be found the fame fugar that was fubjected to the fermentation, and its quantity will be in the inverfe proportion of the alcohol obtained. If there be half the fugar, there will be a certain quantity of alcohol; if there be a quarter of the fugar, there will be half as much more of alcohol, as is well known to thofe who form vinous liquors for diftillation.

It might happen that the whole of the mucilage which, with the water, conftitutes

M 2 the

the coagulable lymph, might by putrefac-
tion at once become foluble in water, fo as
to make a fluid folution; that the whole red
particles of the blood might become foluble
in the ferum, fo as to form a dark reddifh
fluid; that the whole of the mucilage of the
ferum might lofe the property of becoming
folid when expofed to a heat of an hundred
and feventy degrees of Fahrenheit's ther-
mometer, and yet no further change fhould
take place.

It might happen in like manner, that the
other mucilages of the body might only
lofe the properties that depended upon their
folubility in water, and ftill retain their
other qualities.

This, however, does not take place, if
any dead fubftances continue to be expofed
to the circumftances of putrefaction which
have been enumerated, whether they were
colourlefs, or of whatever colour they were
in the healthy living body, they gradually
affume a brown colour, which increafes
until

until it becomes of a shade so deep as to be conceived to be black.

In the progress of this process, substances begin to be extricated, which are vapours in the heat and pressure of the atmosphere.

One of these vapours has a fetid smell, very similar to the smell of a compound of inflammable air and sulphur. This smell has commonly been called a putrid smell, but experiments have not been made to determine whether it be actually a compound of inflammable air and sulphur or not, as far as has come to the knowledge of the author.

Another vapour extricated in this process is gas, whose synomims have been already pointed out, viz. fixed air and carbonic acid; another vapour is pure inflammable air, which does not appear till the end of the process.

M 3   The

The mucilages are partly converted into thefe vapours, but at laft there begins alfo to be found in the mafs, if examined, nitrous acid and muriatic acid, combined with lime and ammonia, and towards the end of the procefs calcareous earth and ammonia, combined with gas.

All thefe things have been afcertained by experiment; it has been conjectured that clay is alfo produced.

Although the mucilages undergo thefe changes in the body of a dead animal, when kept in the fame chemical circumftances in which they were in the body of a living animal, yet there are certain means of preventing them from going through the putrefactive fermentation after the death of the animal. In the firft place, no fuch change will happen, if they be placed in fuch a degree of heat as will freeze the water contained in them; fecondly, this change will not happen in the heat of two hundred and twelve degrees, or even in a heat fomewhat below that degree, though that

degree

degree of heat in which putrefaction will not take place from the heat being too great, has not been exactly afcertained. In the third place, if no pure air whatever touches fuch animal mucilage, no putrefaction will occur in them. In the fourth place, although air fhould touch it, if a certain preffure is made upon it by condenfing the vapours furrounding it to a very great degree, putrefaction will arife much more flowly, though it is not afcertained that there is a degree of preffure which will prevent putrefaction from arifing altogether. Fifthly, if the whole water be feparated from the mucilage by evaporation, no putrefaction will take place in it. Sixthly, if the water be feparated from an animal mucilage by its coagulating in confequence lofing its life, or if it be coagulated by heat, or by certain fubftances applied to it which have this effect, and if the water be afterwards fqueezed out from it; when in any of thefe ways mucilage is feparated from water, and rendered infoluble in water again, the more perfectly it is feparated from the water with which it was

M 4   combined,

combined, and the more perfectly it is ren-
dered infoluble in water, the more difficult-
ly the putrefaction will happen ; and, if it
be perfectly feparated from the water, no
putrefaction will take place. Seventhly,
although a dead animal mucilage be kept in a
heat in which it would putrify moft readily,
which is nearly that of the human body; if it
be expofed to a proper quantity of pure air
for putrefaction, as it is alfo in the human
body; if the air in which it is contained is
neither too rare or too denfe to allow putre-
faction to take place properly, as it is not in
the human body; if it has a proper quantity
of water contained in it; and if its water
be not feparated by evaporation or by tan-
ning, neither of which happen in the
human body without killing the part; if it
fhould be in all thefe circumftances in which
putrefaction takes place moft readily in dead
matter, yet if fuch animal mucilage fhould
be kept immerfed in an acid of any kind,
or in an alkali, or in a metallic falt, or
in gas, or in feveral other fubftances, it will
not putrify. It is to be obferved, however,
that the quantity of thefe fubftances which

<div align="right">are</div>

are applied to it, to prevent it from pu-
trifying under thefe circumftances, muft
bear a certain proportion to the whole of
the mucilage, otherwife they will have no
fuch effect. Let a drop of vitriolic acid be
applied to an hundred weight of animal mu-
cilage, and equally applied to all of it, pu-
trefaction would certainly not be prevent-
ed. There muft be then an adequate pro-
portion of fuch antifermentative antiputref-
cent to produce any fenfible effect; certain-
ly fixty grains of concentrated vitriolic acid
would have no effect on an hundred pounds
of animal mucilage, whether folid or fluid.

Suppofing then we could apply fixty
grains of vitriolic acid to the human body,
which commonly weighs one hundred and
fifty pounds, in which all thefe circum-
ftances of putrefaction are found, we could
not expect any fenfible effect to arife from
it, whether the body be living or dead, and
the fame thing may be faid of all antipu-
trefcent fubftances.

But

But fixty grains of concentrated vitriolic acid can never be applied to the living human body, excepting it be to the furface of the fkin, or rather the fcarf-fkin; for five grains of concentrated vitriolic acid, and that diluted with water, are as much as can be thrown into the ftomach at once, and this cannot be repeated more than fix times in the twenty-four hours. The acid fo thrown in will be deftroyed by the bile and otherwife, and alfo be evacuated, fo that we cannot expect thirty grains to exift in the blood-veffels at once, and certainly we can never get fuch a quantity into them as to be fenfible to any experiment; we cannot therefore apply vitriolic acid, fo as to prevent putrefaction in any perceptible degree. The fame reafoning may be applied to any other antifermentative antiputrefcent, fuch as any other acid, alkali, neutral falt, &c.

Vitriolic acid is among the moft powerful fubftances for preventing putrefaction in proportion to its quantity. Peruvian bark is alfo capable of preventing putrefaction in dead animal matter, placed in circumftances

cumftances in which it would putrify, if the Peruvian bark was not applied to it. But while five drops of vitriolic acid may prevent a pound of dead animal matter from putrifying in a fenfible degree, in circum-ftances in which it would otherwife putrify, it will require five hundred grains of Pe-ruvian bark to have the fame effect upon a pound of dead animal matter; now fup-pofe that Peruvian bark gets into the blood-veffels, which is a queftion, it certainly never could get in in fuch a quantity as to produce a fenfible effect on an hundred and fifty pounds of animal matter; therefore, taking it in this light, we could not expect to get into the blood-veffels fuch a quantity of any antifermentative antiputrefcent, as to prevent the animal body from putrifying, if it were not prevented by the effects of life.

Since the mucilages of the body of a living man are in all the circumftances moft proper for putrefaction, *i. e.* they are in the moft proper heat, are expofed to be acted upon by a moderate quantity of pure air,

are

are combined with a proper quantity of water, are in motion, remain often without change during a time they would putrify in, if they were in the fame circumftances in a dead body, and have nothing in them which prevents them from putrifying when dead, it muft be concluded that the life only prevents them from putrifying, or in other words, that it is as much a property of living matter not to putrify, as it is of dead matter to putrify. Since then nothing can be applied in fuch proportion to them as would prevent them from putrifying if dead, fo nothing can be applied in fuch proportion as can prevent them from putrifying when alive.

Taking the argument in another view, it may be true that fuch a quantity of vitriolic acid, or any other antiputrefcent antifermentative may not be able to get into the body, as to check putrefaction, yet the living power of the body, although diminifhed, would in fome degree ftill prevent putrefaction from taking place. Antifermentative antiputrefcents might fup-

ply

ply the lofs of the living power, fo that
the remaining power of the life, together
with the antiputrefcent power of the anti-
fermentative, might be fufficient to prevent
any putrefaction. The very fmall quantity
of the antifermentative that can be applied
in proportion to the mafs of matter that it
has to work upon, makes it extremely
improbable that it would, even taking the
argument in this view, at all retard putre-
faction.

A certain degree of putrefaction of the
fluids, in a living and otherwife healthy
body, may be brought on by a perfon's
eating falted animal food with farinaceous
matter. This degree of putrefaction is a
difeafe which has been called fea fcurvy,
although it happens equally at fea or on
fhore, when fuch food is made the only
nourifhment. In this cafe, depreffion of
ftrength is the firft fymptom of the difeafe,
which arifes evidently from food difpofed
to putrify, for if the patient lives on food
not difpofed to putrify for two or three
weeks, the depreffion of ftrength, the ap-

<div align="right">pearances</div>

pearances of putrefaction, and the whole diſeaſe are carried off.

In this caſe, neither vitriolic acid, nor Peruvian bark, nor any other antifermentative antiputreſcent, has any effect in taking off the putrefaction, though they can be applied to the food in the ſtomach, and can therefore act upon it in a much larger proportion than they can do on any of the other ſolids or fluids of the body.

It is only native vegetable acid, and the looſer vegetable ſubſtances, which we commonly call greens, which are capable of being digeſted themſelves, and in their digeſtion rather tend to become acid than to putrify, that carry off the depreſſion of ſtrength, the appearances of putrefaction, and the whole diſeaſe.

When putrefaction of the fluids therefore ariſes ſolely from the depreſſion of the powers of the body from uſing improper food, antifermentative antiputreſcents have no power of the preventing putrefaction.

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We can therefore have little expectation of their preventing putrefaction arising from depreffion of ftrength taking place in fever; neither are vitriolic acid, Peruvian bark, &c. found actually to prevent putrefaction, when it arifes from the depreffion of ftrength in a violent fever.

Morcover it has been conceived, that not only putrefaction might be prevented when it arofe in the folids and fluids of the body, but likewife that the parts that had already undergone putrefaction to a certain degree, might be made to return again to that found ftate from which they became putrid.

If animal folids putrify, the firft appearances are, that they acquire an adhefivenefs to other fubftances greater than they had before; they become of a greenifh or brownifh colour, and emit a fetid vapour, and are more foft and flabby. If they be taken in this ftate, and diluted vitriolic acid be applied to them, they lofe their adhefivenefs, become firmer, nearer their colour when found,

found, and lofe their fmell. It has been thought in this cafe, that not only farther putrefaction was prevented, but that the part was re-changed, and brought back to the ftate it was in before the putrefaction began to take place.

On confidering the argument, however, this by no means appears to happen. An acid decompofes the fetid vapour, fo as to take off its fetor, but it does not re-convert the fetid vapour into the folid from whence it was produced; for if the fetid vapour be collected together after it is feparated from the other parts, and an acid is applied to it, no animal folid is produced, though the fmell of the fetid vapour is entirely loft.

That the deftruction of the fetid vapour is a different procefs from the folids re-ac-quiring its firmnefs, is evident, becaufe the folids may re-acquire their firmnefs without the fetor's being diminifhed, by applying an infufion of oak-bark to the matter that is become foft by putrefaction.

The

The action of the infusion of oak bark is in this cafe upon the part that has not been changed by the putrefaction; that part it coagulates as it always would have done; but upon that part which has already been changed by the putrefaction, it has no effect.

For not only fermentation, but also folution and other chemical proceffes, do not take place in every particle of the mafs that is acted upon, at the fame inftant, but progreffively; that is, firft upon one part of the mafs, in that part the properties are totally changed; the properties of the remaining part continuing perfectly the fame.

Thus, if a piece of lime be thrown into a veffel containing muriatic acid, as foon as it is thrown in, a part of the muriatic acid combines with a part of the lime, and forms a compound, viz. calx muriata, whofe properties are perfectly different from the properties of the muriatic acid, or the properties of the lime, the remaining muriatic acid and the remaining lime retaining each its own

N   properties,

properties, fuch as they were before they were thrown into the fame veffel; there are therefore, after the firft inftant of the operation in the whole mafs, lime, muriatic acid, and calx muriata.

Again, fuppofe ferrum vitriolatum, a compound of calx of iron and vitriolic acid, be put into a retort, and a receiver be adapted to it, and the retort be heated to a certain degree, the heat feparates the vitriolic acid from the calx of iron, but not at once: at the beginning of the operation, a part of the vitriolic acid diftills over, a part of the calx of iron remains behind in the retort, and along with it a part of the ferrum vitriolatum, not decompofed, but retaining the fame properties it had before the operation.

So if a mufcular fibre be placed in the circumftances in which it putrifies, the whole does not putrify at once, part putrifies, and is converted into a mucilage foluble in water, and not coagulable; and if the putrefaction go further into fetid vapour, &c.

&c. a part alfo remains coagulable by oak bark. Thus the oak bark renders the part that was unchanged much firmer by coagulating it, but is far from reftoring the whole mafs to what it was before. The coagulated or tanned part has not now the properties the mufcular fibre had before it began to putrify, but is a fubftance with its properties totally different, excepting in its firmnefs; the fetid vapours, and other vapours remaining the fame as if no oak bark had been applied.

In the cafes, therefore, where oak bark, or any fuch fubftances have been applied to give firmnefs to animal fubftances which have become foft by putrefaction, that firmnefs arifes from the coagulation of the parts yet unchanged by the putrefaction, and not from the parts, which have gone through any ftage of putrefaction, returning to their former ftate fo as to have their former properties, and fo as to be ufeful for the purpofes which they ferved in the body before the putrefaction had taken place.

When

When an acid or any other fuch fubftance coagulates, and renders firm a mafs which is already putrified in part, it does not reftore it to its former ftate. When it combines with or decompofes the fetid vapours, it does not unite with them fo as to produce the fubftances that were changed into fuch fetid vapours by putrefaction, nor does it feparate thefe fubftances from the putrid vapours fo as to reftore them to their priftine ftate.

Neither coagulating fubftances, therefore, nor fubftances deftroying fetid vapours, reftore putrid fubftances to what they were before.

Upon the whole, therefore, no expectation can be had of applying fubftances in fevers, where there is difpofition to putrefaction, from putrifying, by any remedy that will either produce in them, or prevent any chemical procefs; much lefs can there be any expectation of reftoring them to their former ftate, when they have actually putrified, by any fuch remedy.

The

The only means, therefore, of preventing putrefaction in fever are: firft, the carrying off the fever by the means already pointed out. When, therefore, fymptoms of great depreffion of ftrength, fuch as great lofs of mufcular power, great oppreffion about the præcordia, fighing, a feel of foftnefs in the pulfe, &c. arife at the very beginning of a fever, a practitioner fhould be more anxious to produce a crifis by antimonial preparations, &c. Secondly, the avoiding all applications which diminifh the force or deprefs the ftrength of the fyftem. Evacuations therefore that are unneceffary, as bleeding, &c. fhould be carefully avoided, the patient fhould be kept quiet in bed, his mind as much at eafe as poffible, &c.

If any of the parts of the body have already putrified, the only way by which the putrid matter can be got rid of, is to fuffer it to pafs through the excretories of the body.

If with ftrong fymptoms of putrefaction of the fluids, an hæmorrhage fhould take

N 3 place

place either from the noſtrils or mouth, or if blood be vomited up, or if it comes from the lungs, or if purging of blood ſhould take place, or an hæmorrhage ſhou'd happen from the womb, or if blood comes along with the urine, even if the hæmorrhage ſhould be in ſmall quantities, the patient is in the utmoſt danger. Should effuſion of blood take place in any of theſe ways, without attending to any thing elſe, every means ſhould be attempted to ſtop ſuch hæmorrhage. The moſt powerful remedy for ſtopping hæmorrhage ariſing from laxity or putrefaction, is the bark of the cin-chona, which ſhould be given in powder to the quantity of an ounce in twenty-four hours, together with acids and other aſtrin-gents. The following form, or ſomething ſimilar, may be exhibited:

R. Decoctum corticis cinchonæ libras duas cum ſemiſſe;

Roſæ rubræ exſiccatæ unciam dimidiam; Acidi vitriolici diluti drachmas quinque.

Decoctum fervens roſæ affunde in vaſe vitreo, dein adde acidum vitriolicum dilu-
tum,

tum et macera, per horam dimidiam. Liquorem frigefactum cola.

R. Colaturæ uncias duas;

Pulveris corticis cinchonæ drachmam unam; misce fiat hauftus quarta quaqua hora fumendus.

Although when hæmorrhage arifes in confequence of putrefaction, all other confiderations muft give way to fo dangerous an accident; other hæmorrhages are not to alter our other attentions during the fever. Sometimes an active hæmorrhage from the noftrils, or another part, carries off the fever in the fame manner as an inflammation, although the hæmorrhage be but in a fmall quantity. If a large hæmorrhage fhould arife without fymptoms of putrefaction, whether it relieves the fever or not, it may be prudent to check it by infufion of rofes, prepared according to the London Pharmacopœia, given to the quantity of two ounces every four hours; but the bark of the cinchona is not to be exhibited, unlefs it be proper from other views in the difeafe.

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The author comes now therefore to treat of the care of patients in a convalefcent ftate, after a regular continued fever.

If a crifis fhould arife at the beginning of the firft week of a regular continued fever, or before the fixth day, the difeafe moft commonly returns, and becomes an inter-mittent.

The author muft again take notice of the fuppofition, that there is fome matter to be altered in the progrefs of a fever before it can be expelled from the fyftem, which he has fhewn is only fuppofition, and is un-fupported by any experiment, no man hav-ing ever feen, fmelt, or tafted fuch matter; it has however been often inculcated, that fuch matter muft be fubdued by allowing the intermittent to go on.

If however a crifis fhould take place in the firft week of a regular continued fever, and if the crifis fhould be perfect or nearly fo, if there fhould be confiderable fweating, if the tongue fhould be clean or nearly fo,

if

if there fhould be a lateritious fediment in
the urine, if the coftivenefs fhould be gone
off, if the head-ach fhould have ceafed al-
together, or nearly, if the pulfe fhould be
lefs than eighty ftrokes in a minute, and to-
lerably free, the author is warranted from
experience to fay, that the bark of the cin-
chona fhould be given in powder immedi-
ately after the crifis, which is commonly
about fix or feven o'clock in the morning,
to the quantity of a drachm every hour,
and continued at leaft for forty-eight hours.

By this practice, it often happens that
a return of any paroxyfm is prevented, and
the patient is freed from the difeafe.

If the crifis has arifen without the exhi-
bition of any medicine, as the author has
fuppofed in what is faid above; if the crifis
has been nearly complete, and the bark of
the cinchona has been employed as has been
reprefented, and notwithftanding this a frefh
paroxyfm of fever fhould return, the cafe
muft be referred to what has been faid in

treating

treating of regular tertian intermittents, or will be faid in treating of irregular intermittents in a future differtation.

Suppofing that preparations of antimony, ipecacuanha, or any other medicine which has the property of producing fymptoms fimilar to thofe which arife in the ordinary crifis of a regular continued fever have been exhibited, and that they have actually produced thefe appearances which take place in fuch crifis, and there is a freedom from the fymptoms of fever equal to that which has already been defcribed, in this cafe the bark of the cinchona fhould alfo be employed as has been defcribed.

Suppofing that in the beginning of a regular continued fever there fhould be much greater pain in the forehead, or over the whole head externally, and that either by applying leeches to the temples, or otherwife making topical evacuations from the head by bleeding, or if in a fimilar cafe blifters have been applied in the firft days of a fever behind the ears, or otherwife to any part of the head, and the pain has ceafed, and all
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the other fymptoms of the difeafe have gone off, although no mifchief would undoubtedly arife from employing the bark of the cinchona, yet as far as the author's obfervation goes, the fever has not returned, though it was not employed.

If in a continued fever no medicine has been employed, and a crifis fhould take place in the firft week of the difeafe, but that crifis fhould be very incomplete; that is, though about four or five o'clock in the morning the patient fhould fall into a fweat, even rather profufe, if there fhould be a lateritious fediment in the urine, but the head-ach fhould not be much abated, if the tongue fhould be ftill foul, if the depreffion of ftrength fhould remain very great, and the other appearances of fever fhould ftill remain without great abatement, it then becomes a queftion, whether the bark of the cinchona fhould be employed in large quantities, fo as to try to prevent a return of a frefh paroxyfm of the fever.

This argument, in the author's opinion, depends on the following circumftances:

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In the firft place, this feldom happens in a regular continued fever in which the fymptoms of the fever come on flightly at firft. If it fhould, as far as the author's experience goes, it is beft to employ the bark of the cinchona in the manner defcribed, for though it often fails in preventing the recurrence of a frefh paroxyfm of the difeafe, yet hardly any mifchief arifes from it. There is in this cafe a chance of terminating the fever immediately, fo that the patient fhall recover his health, for which reafon it had better be employed.

In the fecond place, if a regular continued fever fhould attack a patient at once with violent fymptoms, great fenfe of coldnefs followed by heat, returning alternately for twenty-four hours, or until the evening following, and if there fhould be great head-ach, great depreffion of ftrength, anxiety, &c. and no medicine has been exhibited which produces appearances fimilar to the ordinary crifis of fever; if an imperfect crifis fhould happen in the firft week of the difeafe; in this cafe neither the bark of
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the cinchona, nor any other medicine acting in the fame manner fhould be employed. If this fhould happen, it is proper to employ preparations of antimony, or other medicines of fimilar effect, in the manner that has been already defcribed; when it is wifhed that they fhould exert their effects in the moft powerful manner to carry off the remaining fymptoms of the difeafe.

When the bark of the cinchona has been exhibited, fometimes no frefh attack of the fever has taken place, and the remaining fymptoms of the firft ftage have gradually difappeared; but much more frequently the difeafe has returned, and continued as if no fuch imperfect crifis had happened, and the whole fever has been more fevere, or the appearances which have remained have continued and gradually increafed, and formed a new fever, which has lingered out for feveral weeks; or laftly the patient has been relieved from the fever, but continued in a languid and morbid ftate for a great length of time.

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This obfervation is one of the grounds on which the author has formed his opinion, that the bark of the cinchona prevents the return of fever, but does not take off a fever which is prefent. Preparations of antimony and other remedies having the fame effects exhibited in fuch imperfect crifis in the firft week of the difeafe, often remove the remaining appearances of fever, fo that the patient is reftored to health.

If, on exhibiting preparations of antimony or ipecacuanha, or any other medicine of the fame clafs, a very imperfect crifis fhould be produced in the fecond week of a regular continued fever, the fame method is to be purfued as if the crifis fhould take place when no remedy has been employed.

If no medicine has been employed tending to produce a crifis in a regular continued fever, and a crifis has taken place in the fecond week of the difeafe, if the crifis be tolerably perfect, that is, if a confiderable fweating fhould take place in the morning,

if

if there fhould be lateritious fediment in the urine, if the tongue fhould become tolerably clean, if fome degree of head-ach fhould even remain, and the pulfe fhould remain frequent even to ninety or an hundred ftrokes in a minute, and fome other febrile fymptoms fhould ftill continue, the bark of the cinchona fhould be employed in as large dofes as the patient's ftomach will bear. The fever is not near fo apt to return, or be prolonged, as it is when fuch a crifis takes place in the firft week, and therefore it is better to employ the cinchona, or other medicines of that clafs, than preparations of antimony, or other medicines which have fimilar effects.

The fame thing is to be faid if a crifis has been produced in a regular continued fever by means of preparations of antimony, &c. in the fecond week of the difeafe, or if the fever has been carried off in the fecond week by any other means.

If a crifis fhould take place on the fourteenth day, or any day afterwards, and the fever fhould be diminifhed by it, although

not

not carried off, the appearances of the fever continue almoft always to diminifh until the difeafe goes off; it is therefore not neceffary to employ any remedy with a view of preventing its return.

The great difpofition in a fever to return, if a crifis fhould take place in the firft week of the difeafe, the lefs difpofition which it has to return if a crifis fhould take place in the fecond week of the difeafe, and the very little difpofition which it has to return if a crifis takes place in the third week of the difeafe, moft probably was the foundation of the idea which has prevailed from the earlieft practitioners down to the prefent time, that there was fome matter introduced into the body which required preparation or concoction; that is, that it fhould be in fome way altered, in order to be evacuated before a fever could be got rid of. When, however, it comes to be confidered that this, though it be a poffible explanation of this appearance, is by no means fupported by any other evidence, the author therefore does not think it worth while difcuffing

this

this argument. It would be neceffary for him to write a great many volumes to refute the various opinions, which have been admitted into the theory of medicine as true becaufe they are poffible.

If a crifis fhould take place at any time of a fever, purgatives have often been employed with a view of evacuating any part of the matter which occafioned the fever, that may have remained after the crifis had taken place. The author has already faid, that there is no reafon for fuppofing any fuch matter to exift; that it is mere hypothefis; purgatives, therefore, cannot prevent a fever from returning, or any mifchief from happening by evacuating fuch matter. A purgative has no power of carrying off one fluid out of the blood-veffels more than another; it can only contribute, therefore, to the clearing the body of any particular fubftance, by occafioning a quicker change in the whole fluids. Purgatives would indeed evacuate all thofe which are at prefent in the body, fo that a frefh fet

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of

of fluids would be formed more quickly. The ferum, coagulable lymph, and red blood, and all the healthy fluids, would be fooner re-produced from the food, if thofe which are now in the body are evacuated by purgatives as well as noxious matter, but it would be long before the change would take place, and the noxious matter got rid of. Suppofing there was mixed with the whole blood fome extraneous matter, which amounted to an hundredth part of the whole, and fuppofing that one dofe of a purgative evacuated the hundredth part of the whole fluids, it would take more than fifty dofes of purgatives to evacuate the half of the extraneous matter, for no experiment has hitherto fhewn, that purgatives has any fpecific power of taking away one matter more than another.

It might be fuppofed that purgatives would evacuate the more fluid parts of the blood, and therefore would carry off the ferum and fuperfluous water. If this was the cafe, after purging every day for feve-

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ral days, upon opening a vein, and taking away a quantity of blood, there would be lefs ferum and a larger proportion of coagulum. The contrary of this, however, is found to be the cafe; there is actually lefs coagulum, and more ferum and fuperfluous water.

It is commonly believed, when mercury has been exhibited, fo as to produce falivation, that by exhibiting a purgative the mercury is carried off, and the falivation made to ceafe. The author chofe forty patients as nearly fimilar to each other as could be, who had been cured of fyphilis by mercury, exhibited fo as to produce falivation, and in confequence the falivation was wifhed to be carried off. To twenty of thefe he exhibited purgatives, and to the other twenty no medicine whatever; in this cafe the falivation ceafed much fooner, upon an average, in the twenty to whom no medicine whatever had been exhibited, than in the twenty who ufed purgatives.

It does not appear, therefore, that purging has any power of carrying off any nox-

ious

ious matter remaining after a fever: firft, becaufe there is no evidence of fuch noxious matter exifting; and fecondly, if fuch noxious matter did actually exift, there is no power in a purgative to carry it off.

Moreover, purgatives have a confiderable tendency to re-produce the difeafe, or occafion relapfes, as the author has feen in many inftances, and there are alfo feveral inftances on record, though not related with that view. For inftance, De Haen relates a cafe, where he fays, that a fever returned, though there was a perfect crifis about the end of the fecond week, although purgatives had been exhibited; in that cafe, the purgatives evidently re-produced the fever. Purgatives are, therefore, never to be employed after the crifis of a fever, excepting there fhould be coftivenefs, and in that cafe only fo as to produce one evacuation.

If a crifis fhould happen in the firft or fecond week of a fever, the patient is never fo much reduced in his ftrength as to require food of great nourifhment. After fuch a crifis, it is much better to confine him for

feveral

feveral days to fuch food as he employed during the fever, efpecially to avoid all folid animal food, more relapfes having been obferved by the author to arife from ufing folid animal food too foon, than from any other caufe.

If a crifis fhould happen in the third week of a regular continued fever, although the patient be extremely weakened by the difeafe, yet no folid animal food is to be given; for it is to be obferved, that the caufe of the weaknefs, the exertions in the fever, have ceafed. Very moderate nourifhment in proportion to what mankind ufe commonly in cultivated countries, together with fleep, which in this cafe is generally eafy and refrefhing, is fufficient to recruit his ftrength. He fhould therefore for many days refrain from folid animal food, the ufe of which, the author has already obferved, he has found more productive of relapfes than any other caufe whatever.

For the knowledge of the quantity of food which men ufe in civilized nations more than is neceffary, the author begs leave to refer to his treatife on Digeftion.

If

If the patient is to avoid folid animal food when a perfect crifis takes place in the third week, although he has been much exhaufted, it is much more to be avoided after a crifis has taken place in the firft or fecond week, when the patient is not only lefs exhaufted, but when there is likewife greater danger of a relapfe.

If no crifis fhould take place in the firft or fecond week of a regular continued fever, and if in the third week the fever fhould gradually diminifh by critical fymptoms taking place one after another; that is, if the tongue has been covered during the whole of the difeafe with a mucous cruft, and that cruft begins to leave the edges of the tongue, or exfoliates in fmall pieces all over the tongue, or if the tongue has had a raw appearance when moift, and a glaffy one when dry, if it begins to be covered with its ordinary mucus, and is putting on its common appearance, if the pain in the forehead is gradually ceafing or entirely gone off, if there be a lateritious fediment in the urine for a day or two, which afterwards ceafes, if the fkin becomes gradually moift,

or

or a flight fweat fhould arife about four or five o'clock in the morning, if the coftive-nefs fhould go off by degrees, or there fhould be fome laxity in the inteftines, if the pulfe fhould become flow, or if it fhould fall at once to between eighty or ninety ftrokes in a minute, if the fkin fhould return gradually to its ordinary colour, if thefe appearances of crifis fhould appear after one another, or in a flighter degree at firft, and gradually becomes more confpicuous, the patient muft be abfolutely forbid the ufe of folid animal food for many days after the fever has begun to fubfide, or even of any food in too great a quantity, efpecially at once.

If a crifis fhould take place in the firft or fecond week of a continued fever, and fhould be very perfect, the patient fhould not be confined to bed during the whole twenty-four hours, but fhould be covered with his ordinary clothing; but if the crifis be incomplete, and feveral of the fymptoms of the firft ftage ftill remain, it is better that he fhould be confined to bed until thefe appearances go off.

If

If a complete crifis fhould take place in the third week of a regular continued fever, or if feveral critical fymptoms fhould take place, it is better that the patient fhould be covered with his ordinary clothing, even fuppofing that he is obliged to lie upon the bed, excepting where the weaknefs is fo very great, that he is apt to faint in being placed in an erect pofture, or on any extra-ordinary exertion.

If the difeafe fhould begin gradually to diminifh in the third week, when the diminution is become confiderable, it is better alfo that the patient fhould be covered with his ordinary clothing during the day time.

The next differtation will take notice of the irregularities and accidents which happen in intermitting and remitting fevers.

FINIS.