Essays medical and experimental : to which are added, select histories of diseases, with remarks, and proposals for establishing more accurate and comprehensive bills of mortality / by Thomas Percival.

Sir. J. Mc. Grigor Bart.

ESSAYS

MEDICAL AND EXPERIMENTAL,

ON THE

Following SUBJECTS;

1. On the COLUMBO ROOT.
2. On the ORCHIS ROOT.
3. On the WATERS of BUXTON and MATLOCK in Derbyshire.
4. On the Medicinal Uses of FIXED AIR.
5. On the antiseptic and sweetening powers, and on the varieties of FACTITIOUS AIR.
6. On the Noxious Vapours of CHARCOAL.
7. On the ATRABILIS.
8. On SEA SALT.
9. On COFFEE.

TO WHICH ARE ADDED,

SELECT HISTORIES OF DISEASES,

WITH REMARKS; AND

PROPOSALS FOR ESTABLISHING MORE ACCURATE AND COMPREHENSIVE BILLS OF MORTALITY.

BY

THOMAS PERCIVAL, M.D. F.R.S. & S.A.

——— *Sicut formica,*
Ore trahit quodcunque poteſt atque addit acervo.
HOR. Lib. 1. Sat. 1.

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THE

FOLLOWING

ESSAYS

ARE INSCRIBED

TO

THE RIGHT HONOURABLE

GEORGE

EARL OF STAMFORD,

&c. &c. &c.

AS A TRIBUTE

OF

ESTEEM, RESPECT, AND GRATITUDE,

BY

HIS LORDSHIP'S

MOST OBLIGED

AND MOST OBEDIENT SERVANT,

THOMAS PERCIVAL.

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THE PREFACE.

THE great Lord Verulam recommends the collecting of facts, obſervations, and experiments, as the beſt method of promoting the improvement of phyſic; and experience hath fully evinced the utility of ſuch a plan. In this way I am ambitious of contributing my mite to the general ſtock of medical

knowledge; and ſhall think myſelf happy, if I can thus render the purſuit of my own inſtruction and amuſement, ſubſervient to the intereſts of my profeſſion, and to the general good of mankind.

THE Obſervations on the COLUMBO ROOT have been read at the College of Phyſicians, and before the Royal Society; and have been communicated to a conſiderable number of my friends and correſpondents, to ſome of whom this remedy was unknown, and by others applied only to the cure of the *cholera morbus*. During the courſe of the

the laſt year, I have had the ſatisfaction of receiving from them the ſtrongeſt teſtimonies of its efficacy, in a variety of diſorders. What I have advanced, therefore, in its favour, may be regarded, not as the concluſions of an individual, partial to a favourite remedy, but as facts ſupported by the experience of many learned and ingenious Phyſicians.

THE diſſertation on the ORCHIS ROOT has been honoured, by Doctor Hunter of York, with a place in the Georgical Eſſays, a uſeful and entertaining work on the ſubject of agriculture. But as it contains ſome experiments and obſervations on the medicinal qualities

ties, as well as on the culture and preparation of this root, it is here reprinted, with a few corrections and additions.

THE papers on FACTITIOUS AIR form a part of an experimental inquiry into this intereſting and curious branch of phyſics; in which the friendſhip, and too favourable opinion of Dr. Prieſtley firſt engaged me, in concert with himſelf. But this learned philoſopher, who poſſeſſes a happier genius, more leiſure, and better health than I am bleſt with, has carried his reſearches far beyond the limits of mine; and his pleaſing and wonderful diſcoveries in theſe almoſt trackleſs paths of ſcience, will reflect

flect the higheſt honour on his induſtry and abilities.

To this ſecond volume of Experimental Eſſays, I have annexed a few ſelect HISTORIES of DISEASES, agreeable to the plan of Lord Bacon, who adviſes Phyſicians "to revive the Hippocratic method of compoſing narratives of particular caſes, in which the nature of the diſeaſe, the manner of treating it, and the conſequences are to be ſpecified; to attempt the cure of thoſe diſeaſes, which have been too boldly pronounced incurable; and to extend their inquiries into the powers of particular medicines, in the cure of particular diſorders." *(a)*

THE

(a) De Augment. ſcient. l. iv. cap. 2.

THE PROPOSALS for eſtabliſhing more accurate and comprehenſive BILLS of MORTALITY, were ſuggeſted by the peruſal of a Treatiſe on Reverſionary Payments, lately publiſhed by my friend Dr. Price; who employs his great mathematical knowledge, not in idle ſpeculation, or in the ſolution of amuſing problems, but in diſquiſitions at once curious, inſtructive, and of the higheſt importance to the intereſts of mankind. The Plan has been honoured with his approbation, and is likely to be carried into immediate execution at Mancheſter.

I CANNOT take my leave of the candid reader without intimating

ing, that though the experiments contained in theſe ſheets were made with great care, and are related with the ſtricteſt fidelity, I am ſenſible many inaccuracies may have eſcaped me; which thoſe will moſt readily excuſe, who have experienced the difficulties incident to ſuch reſearches. The Philoſopher has frequent occaſion to lament both the fallacy of his ſenſes, and the limited powers of his underſtanding. " You will wonder, ſays Mr. Boyle, in the preface to his philoſophical Eſſays, that I ſhould uſe ſo often *perhaps*, *it ſeems*, *'tis not improbable*, words which argue a diffidence of the truth of the opinions I incline to. But I have hitherto not unfrequently

quently found that what pleaſed me for a while, was ſoon after diſgraced by ſome further, or new experiment." Such is the imperfection of human knowledge, even when derived from evidence, which is uſually regarded as the moſt clear, and inconteſtible. And ſo true is the ſentiment of the comic poet,

Nunquam quiſquam ita bene ſubducta ratione
ad vitam fuit,
Quin res, ætas, uſus aliquid apportet novi,
Aliquid admoneat, ut illa quæ te ſcire credas, neſcias,
Et quæ tibi putaris prima in experiundo repudies.

TERENT.

MANCHESTER,
1ſt Jan. 1773.

THE

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EXPE-

EXPERIMENTS

AND

OBSERVATIONS

ON THE

COLUMBO-ROOT.

—— *Symbolum aliquid, utcunque exiguum, in commune medicinæ ærarium contribuerem.*

SYDENHAM.

OBSERVATIONS AND EXPERIMENTS

ON THE

COLUMBO-ROOT.

THE Columbo-root, though a medicine of conſiderable efficacy, is not ſo generally known in practice as it deſerves to be. Books, ſo far as my reading extends, are ſilent about it; and I have not hitherto been able to obtain any ſatisfactory information concerning its Natural Hiſtory. The celebrated Linnæus is unacquainted with it. Dr. Watſon made particular enquiry concerning it of an Eaſt-India Governor, and alſo of Mr. Loten, who was ſeveral years Governor of Ceylon. Theſe Gentlemen

informed him only that the root was brought to Ceylon, and to our ſettlements, where it is called in the Portugueſe language *Raijs de Moſambique*. Doctor Hope, Profeſſor of Botany at Edinburgh, has tranſmitted to me the following account, which he received from Dr. Rainey, a Phyſician who reſided a long time in the Eaſt-Indies. The Columbo-root grew originally on the continent of Aſia, and was from thence tranſplanted to Columbo, a town in Ceylon, which now gives name to it, and ſupplies all India with it. The inhabitants of theſe countries have for a long time uſed it in diſorders of the ſtomach and bowels. They carry it about with them, and take it ſliced or ſcraped, in Madeira wine.

The Columbo-root comes to us in circular pieces, which are from half an inch to three inches in diameter; and divided into *fruſta*, which meaſure in length from two inches to one quarter of an inch.

inch. The ſides are covered with a thick, corrugated bark, of a dark brown hue on its external coat, but internally of a light yellow colour. The ſurfaces of the tranſverſe ſections appear very unequal, higheſt at the edges, and forming a concavity towards the centre. On ſeparating this ſurface, the root is evidently ſeen to conſiſt of three *lamina*, viz. the cortical, which in the larger roots is a quarter of an inch thick; the ligneous, about half an inch; and the medullary which forms the center, and is near an inch in diameter. This laſt is much ſofter than the other parts, and when chewed ſeems very mucilaginous: A number of ſmall fibres run longitudinally through it, and appear on the ſurface. The cortical and ligneous parts are divided by a circular black line. All the thicker pieces have ſmall holes drilled through them, for the convenience of drying.

THIS root has an aromatic ſmell, but

is disagreeably bitter and slightly pungent to the taste, somewhat resembling mustard-seed, when it has lost by long keeping part of its essential oil. Yet though ungrateful to the taste, when received into the stomach it appears to be corroborant, antiseptic, sedative, and powerfully antiemetic.

In the CHOLERA MORBUS it alleviates the violent *tormina*, checks the purging and vomiting, corrects the putrid tendency of the bile, quiets the inordinate motions of the bowels, and speedily recruits the exhausted strength of the patient. Mr. Johnson of Chester, a surgeon of eminence, who served ten years on board one of his Majesty's ships in the East Indies, and in 1756 had the care of an hospital-ship, gave the Columbo-root in that climate to a great number of patients, often twenty in a day, attacked with this disease. He seldom employed any means to promote the discharge of bile, or to cleanse

cleanſe the ſtomach and bowels, previous to its exhibition: And he generally found that it ſoon ſtopped the vomiting, which was the moſt fatal ſymptom, and that the purging and remaining complaints, quickly yielded to the ſame remedy. The mortality on board his ſhip, after he uſed this medicine, was remarkably leſs than in the other ſhips of the ſame fleet; and this difference he attributes entirely to the good effects of the Columbo-root in this fatal diſorder. The doſe he gave was from half a drachm to two drachms of the powder, every three or four hours, more or leſs according to the urgency of the ſymptoms.

THOUGH Columbo-root does not ſeem to poſſeſs much, if any degree of aſtringency, yet I have often obſerved very ſalutary effects from its uſe, in DIARRHOEAS, and even in the DYSENTERY. In the firſt ſtage of theſe diſorders, when aſtringents would be hurtful, this root

may be preſcribed with ſafety and advantage, for by its antiſpaſmodic powers, it corrects the irregular action of the *primæ viæ*. But as a cordial, tonic, and antiſeptic remedy, it anſwers better when given towards their decline.

I HAVE more than once experienced its efficacy in the vomitings which attend the BILIOUS CHOLIC; and in ſuch caſes where an emetic is thought neceſſary, after adminiſtering a ſmall doſe of ipecacuan, the ſtomach may be waſhed with an infuſion of Columbo-root. This will anſwer the purpoſes of an evacuant, as well as chamomile tea, and will tend to prevent thoſe violent and convulſive reachings which in irritable habits, abounding with bile, are ſometimes excited by the mildeſt emetic. The efficacy of ipecacuan in the cholic, given in ſmall doſes, is well known; and perhaps its operation as an antiſpaſmodic may in ſome meaſure depend on the nauſea which it produces.

But

But unfortunately it often occaſions very ſevere ſickneſs and vomiting, and thus aggravates the diſorder, by inducing a new and moſt diſtreſſing ſymptom. Perhaps (for I ſpeak not from experience) if it were combined with ſome grateful aromatic, and adminiſtered in an infuſion of Columbo, prepared with mint water, this troubleſome effect might be obviated.

IN BILIOUS FEVERS, fifteen or twenty grains of this root, with an equal or double quantity of vitriolated tartar, given every four, five, or ſix hours, produce very beneficial effects. The neutral ſalt abates the febrile heat, allays thirſt, and brings on a gentle ſalutary *diarrhœa*; whilſt the Columbo-root ſupports the ſtrength of the patient, obviates the nauſea and ſickneſs to which he is ſo much diſpoſed, and powerfully checks the ſeptic ferment in the *primæ viæ*. When the belly is ſufficiently ſoluble, an infuſion of it may be directed, well acidulated

lated with *elixir vitriol. dulc.** Is it not probable, that the Columbo may be highly ſerviceable in the malignant, YELLOW FEVER of the Weſt-Indies? This fever is always attended with great ſickneſs, violent reachings, and a copious diſcharge of bile. The vomiting recurs at

* DR. HAYGARTH, a very ingenious Phyſician at Cheſter, has lately by my recommendation, made trial of the Columbo-root, in a fever of the bilious kind, which has been epidemic at Namptwich, and in other parts of Cheſhire; and he has favoured me with the following account of his ſucceſs. "After the *primæ viæ* have been ſufficiently unloaded of their bilious, and other putreſcent contents, I find the Columbo-root a moſt uſeful remedy, in allaying the nauſea and reachings, to which the patients are liable. In this fever, though the remiſſions are very evident, and the acceſſions generally marked with chills and other ſymptoms of an intermittent, yet the bark appears to do more harm than good, as it occaſions an increaſe of feveriſh heat, and a parched tongue. The Columbo in theſe caſes ſeems to ſupply its place moſt admirably, by correcting the bile, reſtoring the proper tone of the ſtomach, and of the whole habit. It alſo prevents relapſes, to which in this fever, the patients are particularly diſpoſed."

"SUCH

at ſhort intervals, often becomes almoſt inceſſant, and an incredible quantity of bile is ſometimes evacuated, in a few hours.

CHILDREN during DENTITION, are frequently ſubject to ſevere vomitings and diarrhœas. In theſe caſes the Columbo-root is an uſeful remedy; and I have ſeen almoſt inſtant relief procured by it, when other efficacious medicines had been tried in vain. The more effectually to correct the acidities which at ſuch times uſually prevail, a little chalk or magneſia may be combined with it.

THE

"SUCH have been the good effects of the Columbo-root in the caſes which have fallen under my own obſervation; but a judicious Apothecary informs me, that he has often ſeen it fail of ſucceſs in this fever, which in no reſpect ſeems wonderful. It is not ſuppoſed that Columbo has any febrifuge quality, ſimilar to antimony, or Peruvian bark. By correcting the putrid bile it deſtroys the *fomes* which aggravates the fever, and produces many of its moſt dangerous ſymptoms. When bilious fevers are epidemical, does it not ſeem a probable remedy to prevent the diſeaſe?"

THE Columbo-root is extremely beneficial in a LANGUID STATE of the STOMACH, attended with want of appetite, indigeſtion, nauſea, and flatulence. It may be given either in ſubſtance, with ſome grateful aromatic, or infuſed in Madeira wine, and during the uſe of it, gentle doſes of the tincture of rhubarb, or of any other ſtrengthening and cordial purgative, ſhould occaſionally be preſcribed. If the bile appear to be defective, a ſufficient quantity of ox gall, carefully evaporated to the conſiſtence of an extract, may be mixed with the powder of Columbo, and the maſs reduced into pills. In this manner I have frequently taken the Columbo-root myſelf, and have generally found my appetite increaſed, and my digeſtion improved by it.

HABITUAL VOMITING, when it proceeds from a weakneſs or irritability of the ſtomach, from an irregular gout, from acidities,

acidities, from acrimonious bile, or an increaſed and depraved ſecretion of the pancreatic juice, are greatly relieved by the uſe of Columbo-root, in conjunction with aromatics, chalybeates, or the teſtaceous powders. But this diſeaſe often ariſes, when ſuch a cauſe is leaſt ſuſpected, from an affection of the kidneys. Under ſuch circumſtances, demulcents, and gentle diuretics, are the moſt ſucceſsful remedies; though I have frequently obſerved temporary relief procured by a light infuſion of this root in mint water.

SUCH an infuſion ſucceeds better than any other medicine I have tried, in the nauſea and vomiting occaſioned by PREGNANCY. But it is ſometimes neceſſary to premiſe venæſection, and always expedient to keep the patient's body moderately open with magneſia.

I COULD illuſtrate the truth of theſe obſervations, by a variety of caſes; but to enter into ſo minute a detail would be equally unneceſſary and unintereſting. I ſhall confine myſelf therefore to the relation of a few hiſtories, which exemplify the peculiar, or if the expreſſion be allowable, ſpecific qualities of the Columbo-root.

CASE I.

T. H. of Newton-lane near Mancheſter, in the month of Auguſt 1770, from expoſure to cold when overheated with hard labour, was attacked with a ſevere purging and vomiting, accompanied with violent pain in his ſtomach and bowels. He continued in this miſerable condition twenty-four hours before I ſaw him, and his ſtrength was then nearly exhauſted. I directed two ſcruples of the powder of Columbo-

Columbo-root, to be given every three or four hours in pepper-mint water. This remedy afforded almoſt immediate relief; but the patient returning too ſoon to his occupation, had a relapſe, and was again reſtored to health by the ſame medicine.

*CASE II.

W. W. Auguſt 31. 1770, had been ſeized with a looſeneſs three days before, which had gradually increaſed, and for the laſt four hours, been moſt violent, attended with frequent vomiting, and cramps in his extremities. He was directed to take a ſcruple of the powder of Columbo every two hours, and had neither vomiting, nor purging after the firſt doſe. Nine doſes reſtored him to perfect health.

* Communicated by Dr. Haygarth.

CASE

*CASE III.

APRIL, 1771. Mrs. P—— about the beginning of the third week of her confinement in child-bed, began to complain of great pain, fullneſs, and uneaſineſs in the bowels, accompanied with frequent and copious evacuations by ſtool. What was diſcharged had the colour and conſiſtence of cream. The pulſe was from 100 to 115. The tongue had a whitiſh fur; and the ſkin was often dry and hot. The evacuations by ſtool, and the other ſymptoms were always much more conſiderable during the night, than in the day. Ipecacuanha as an emetic, opiates, elixir of vitriol, and other cooling reſtringents, afforded no relief. A ſtrong infuſion of the Columbo-root in cinnamon tea, was then given with the deſired effect. After every tea-cup full of the infuſion

* Communicated by Dr. Dobſon of Liverpool.

fuſion the patient found herſelf better; the painful ſenſations were relieved, and the evacuations diminiſhed. In about five days ſhe was entirely cured.

CASE IV.

R. N. Eſq. aged 26, the latter end of June 1771, when the weather was extremely hot, was ſeized with the uſual ſymptoms of a fever. An emetic and gentle cathartic were adminiſtered, and ſaline draughts were directed to be taken at proper intervals. He perſiſted in this courſe two or three days, without any ſenſible relief. A continual nauſea, and frequent vomitings of green bile now came on. The ſkin was hot and dry; the pulſe beat an hundred and twenty ſtrokes in a minute; the tongue was foul; the belly not ſufficiently ſoluble, notwithſtanding the free uſe of ſtrawberries, and other fruit was enjoined; and he com-

plained of great pain in his head and back, attended with univerſal laſſitude. A clyſter was immediately injected; and two ſcruples of vitriolated tartar were given every four hours, in three ſpoonful of the infuſion of Columbo. The firſt doſe almoſt inſtantly alleviated the nauſea and ſickneſs, and the continuance of the ſame remedy entirely prevented their return; whilſt the gentle diarrhœa produced by the neutral ſalt, mitigated all the febrile ſymptoms. On the eleventh day he had two bloody ſtools, and as his conſtitution was feeble and relaxed, the Peruvian bark combined with aſtringents was adminiſtered without delay: The hæmorrhage was ſoon checked, and the patient gradually recovered his uſual health and ſtrength.

CASE V.

JUNE 2d, 1771. Mr. W.'s ſon, aged 2, with other ſymptoms of dentition, had ſevere

ſevere purging and vomiting, which continuing three days, reduced him to the loweſt degree of weakneſs. I directed five grains of Columbo-root, and three grains of *pulv. e chel. c. c.* to be taken every two hours. The vomiting was ſtopped by the firſt doſe; the looſeneſs was ſoon after checked, and in two days the child recovered his uſual ſtrength.

I SHALL now proceed to relate the experiments which I have made on the Columbo-root.

EXPERIMENT I.

Two drachms of Columbo-root powdered, were infuſed without heat, in four ounces of each of the following *menſtrua*. 1. Rectified ſpirit of wine. 2. French brandy. 3. Madeira wine. 4. White wine. 5. Diſtilled water. 6. White wine vinegar. 7. Hard ſpring water. After twen-

ty-four hours digeſtion, the tinctures, &c. were filtered through paper, and equal quantities of each, and of their reſpective *menſtrua* were weighed with great exactneſs, and compared together. The tincture made with rectified ſpirit of wine, appeared by its taſte, colour, and ſuperiour ſpecific gravity to the ſimple ſpirit, to be conſiderably ſtronger than the reſt; whoſe degree of impregnation, ſeemed by theſe teſts, to be exactly in the order in which I have enumerated the ſeveral *menſtrua* employed in their preparation. It ſhould be remarked, that the watery infuſion of Columbo-root is more periſhable than that of other bitters. In twenty-four hours a copious precipitation takes place in it, and in two days it becomes ropy and even muſty.

EXPERIMENT II.

The addition of orange peel renders the infuſion of Columbo-root leſs ungrateful

grateful to the palate. An ounce of the powdered root, half an ounce of orange-peel, two ounces of French brandy, and fourteen ounces of water, macerated twelve hours without heat, and then filtered through paper, afforded a ſufficiently ſtrong, and tolerably pleaſant infuſion.

EXPERIMENT III.

TWELVE ounces of Columbo-root in groſs powder were digeſted four days in three pints of rectified ſpirit of wine. The tincture was then filtered; and the *reſiduum* boiled repeatedly in a ſufficient quantity of water, till it yielded no taſte to the liquor. The decoctions, having been carefully percolated, were evaporated over a gentle fire in the common method, till about three quarts only remained. The evaporation was then continued in the vapour bath, and when nearly finiſhed, the tincture, from which a part of the

ſpirit had been previouſly drawn by the alembic, was gradually added, and the whole reduced to a pilular conſiſtence, retaining the entire flavour of the Columbo, free from the leaſt degre of *empyreuma*, and weighing eight ounces and two drachms. The ſpirit diſtilled from the tincture was neither impregnated with the taſte nor odour of the root; which is a proof that no volatile parts were diſſipated by this proceſs. This experiment was made at my requeſt, by Mr. Henry, an ingenious and accurate Apothecary in Mancheſter. I have frequently uſed the extract of Columbo, and find it equal, if not ſuperior in efficacy to the powder.

EXPERIMENT IV.

EQUAL weights, viz. about two drachms of beef, cut into ſmall pieces, were macerated ſeparately in an ounce of a cold infuſion of the Peruvian bark, and of Columbo-

lumbo-root, filtered and prepared in a manner exactly similar. The experiment was made in the month of July, the weather was uncommonly warm, and the bottles were placed in a window which had a southern aspect. In forty-eight hours the beef in the infusion of Columbo-root had acquired a slightly putrid fœtor, whilst that in the infusion of bark remained perfectly sweet, and continued so ten hours longer. Two drachms of beef macerated in cold water, and intended for a standard, became putrid in twenty-four hours, under the circumstances above described.

EXPERIMENT V.

The putrid beef employed as a standard in the last experiment, was divided into two equal parts, to one of which was added an ounce of the infusion of Columbo-root; to the other the same quan-

tity of the infuſion of Peruvian bark. After ſix hours maceration, the pieces of fleſh had loſt much of their putrid fœtor; but that in the infuſion of Columbo-root, was more offenſive than the other.

EXPERIMENT VI.

To ſeveral phials, each containing three drachms of putrid ox gall, and two drachms of ſaliva, were added equal quantities, viz. an ounce of, 1. the infuſion of Columbo-root; 2. the infuſion of Peruvian bark; 3. the infuſion of chamomile flowers; 4. ſpring water: the laſt was intended as a ſtandard. The phials were placed in a water bath, heated to about 100 degrees of Farenheit's thermometer. When the infuſion of bark was mixed with the putrid gall and ſaliva, it inſtantly produced a coagulation of the gall, and conſiderably increaſed the fœtor of it. Whereas the infuſion of Columbo united perfectly with it,

it, and very powerfully corrected its offenſive ſmell. The infuſion of chamomile occaſioned no change in the bile, either with reſpect to its fœtor or fluidity. After three hours digeſtion, the putrid ſmell of the gall was much abated, in all the phials but the ſtandard, and even in that was leſs perceptible than at firſt. In ſix hours no fœtor could be perceived, except in the ſtandard; and the mixture with the bark had acquired a vinous ſmell, and emitted many air bubbles. In twelve hours the odour of the gall was ſenſible, but not offenſive in the mixtures with Columbo and chamomile: The bark now fermented leſs, and had loſt ſomewhat of its vinous ſmell. In twenty-four hours the ſtandard became extremely putrid; the mixture with bark was ſour; the Columbo and chamomile were ſtill ſweet; but in thirty hours they became putrid, and in forty hours they were highly offenſive.

The inſtantaneous effect of the infuſion of Columbo in correcting the putridity of the ox gall, ſerves in ſome meaſure to explain its action in the *cholera morbus*, and other diſeaſes, attended with a redundance and depravation of the bile: And at the ſame time it obviates all objection to the uſe of this remedy, previous to any artificial evacuations; in the firſt ſtage of ſuch diſorders; a practice which indeed is juſtified by its ſucceſs. The coagulation and increaſed fœtor of the gall, which the infuſion of bark occaſioned, very well account for the diſagreement of that medicine with the ſtomach in the yellow fever of the Weſt-Indies. Doctor Hillary laments that though ſtrongly indicated, it cannot be retained, even under the pleaſanteſt form. Is it not probable that the Columbo-root, which ſo readily unites with, and ſo quickly ſweetens putrid bile, would prove very ſalutary in this dangerous and malignant diſeaſe?

EXPE-

EXPERIMENT VII.

EQUAL quantities, viz. an ounce of water, of the infuſions of Columbo-root, Peruvian bark, and chamomile flowers, were added to four phials, each containing three drachms of freſh ox gall, and two drachms of ſaliva. The bottles were then placed at ſuch a diſtance from the fire, as to be kept blood-warm. In ſix hours all the mixtures except the ſtandard, were in fermentation. The infuſion of bark emitted moſt, and that of Columbo the feweſt air bubbles: The former alſo had acquired a vinous ſmell. In twenty-four hours the ſtandard became putrid. In forty-eight hours the infuſion of bark was ſour, that of chamomile ſlightly putrid; but that of Columbo-root was perfectly ſweet, and continued ſo many hours afterwards, when the phials were ſet aſide.

N. B. THE infuſion of bark when mixed

mixed with the recent gall produced a coagulation, but not in ſo great a degree as when combined with putrid bile.

Sir John Pringle found that chamomile flowers reſiſt the purefaction of animal fleſh, more powerfully than Jeſuit's bark; and from one of the preceding experiments it appears that in this reſpect, bark is more antiſeptic than Columbo-root. But as a preſervative of the *bile* from putridity, this root ſurpaſſes *chamomile flowers*, without producing like the bark any changes in it by fermentation. Hence may be juſtly inferred the utility of Columbo-root in diſorders of a putrid tendency, and in an impaired digeſtion from corrupted bile, or vitiated and unſound ſaliva.

EXPERIMENT VIII.

To determine the comparative action of Columbo-root, on the fermentation of

of food in the ſtomach; I digeſted in the water bath three alimentary mixtures, prepared of two drachms of the crumb of bread, the ſame quantity of roaſted mutton chopped very ſmall, and an ounce of the infuſions of Columbo-root, chamomile flowers, and muſtard ſeed. The ingredients of each mixture were well united by triture in a mortar; and a fourth phial was provided as a ſtandard, which contained the proportions beforementioned of bread and mutton, with half an ounce of water, and the ſame quantity of ſaliva. In twelve hours the ſtandard began to ferment; in thirty hours an inteſtine motion was perceptible in the other mixtures, but appeared to be leaſt in the phial which contained the Columbo-root. In forty-eight hours the ſtandard became ſour. The third day the mixture with the infuſion of chamomile was alſo ſour. The two remaining phials, viz. the infuſions of Columbo and of muſtard, were now placed by the fire,

where

where they continued ten days, without ſhewing the leaſt ſigns either of acidity, or of putrefaction.

The reſemblance between the taſte of muſtard and of Columbo-root, induced me to try their comparative action on alimentary fermentation. And it appears that they concur in moderating, without ſuſpending the proceſs of digeſtion. This property gives Columbo-root the advantage over other bitters, in ſuch diſorders of the ſtomach, as are attended with a violent fermentation of the food, with flatulence, and great acidity. And if a ſtimulus be wanting to excite this organ to a quicker expulſion of its contents, ſome grateful aromatic may be combined with it: Or perhaps muſtard-ſeed would equally anſwer this intention, without increaſing, like the ſpices, the generation of air. This experiment proves the remarkable efficacy of the Columbo in preventing acidities; and the ſucceeding one no leſs clearly

clearly evinces its power of neutralizing them.

EXPERIMENT IX.

To an ounce of the infuſions of chamomile flowers, of Columbo-root, and of Peruvian bark, were added twenty drops of vinegar. The infuſion of Columbo entirely neutralized the acid, that of chamomile flowers in ſome meaſure covered the taſte of it; but the infuſion of bark was evidently ſour both to the taſte and ſmell, and it required twenty drops more of vinegar, to render the infuſion of Columbo equally acidulated with that of the bark.

EXPERIMENT X.

To aſcertain the action of Columbo-root on the heart and arteries, I took a ſcruple

ſcruple of the powder in a ſmall glaſs of ſpring water, at ſeven o'clock in the evening. My ſtomach was empty; I had been ſitting at reſt an hour; and my pulſe then beat ſeventy-four ſtrokes in a minute. I continued to ſit ſtill half an hour longer, and every fifth minute examined my pulſe, but could perceive no variation, either in its regularity, fullneſs, or velocity. The ſucceeding evening I repeated the ſame experiment, with the precautions I had before obſerved, and increaſed the doſe of Columbo to half a drachm. At the time I ſwallowed the powder, my pulſe beat eighty ſtrokes in a minute; in ten minutes it became fuller, and ſlower by three ſtrokes, and continued to beat the ſame number, viz. ſeventy-ſeven for three quarters of an hour.

THIS experiment ſhews that the Columbo-root does not belong to the claſs of heating bitters: It may therefore be uſed with propriety and advantage in the

pthiſis

pthiſis pulmonàlis, and in hectical caſes, to correct acrimony, and ſtrengthen the organs of digeſtion. The Peruvian bark often proves oppreſſive to the ſtomach in ſuch diſorders, and ſometimes excites a *diarrhœa*. But the Columbo-root occaſions no diſturbance, and agrees very well with a milk diet, as it abates flatulence, and is indiſpoſed to acidity.

ON THE PREPARATION, CULTURE, AND USE OF THE ORCHIS ROOT.

Fungar vice cotis.

HOR.

ON THE

PREPARATION, CULTURE, AND USE

OF THE

ORCHIS ROOT.

SALEP is a preparation of the root of Orchis, or Dogſtones, of which many ſpecies are enumerated by Botanical writers. The *Orchis maſcula, Linn. ſp. pl.* is the moſt valued, although the roots of ſome of the palmated ſorts, particularly of the *Orchis latifolia*, are found to anſwer almoſt equally well. This plant flouriſhes in various parts of Europe and Aſia, and grows in our country ſpontaneouſly, and in great abundance. It is aſſiduouſly cultivated in the Eaſt, and the root of it forms a conſiderable part of the

diet of the inhabitants of Turkey, Perſia, and Syria. A dry and not very fertile ſoil is beſt adapted to its growth. An ingenious friend of mine, in order to collect the ſeed, tranſplanted a number of the Orchiſes into a meadow, where he had prepared a bed well manured for their reception. The next ſpring few of them appeared, and not one came to maturity, their roots being black and half rotten. The ſame gentleman informed me, that he had never been able to raiſe any plant from the ſeed of the wild Orchis; but he aſcribes his want of ſucceſs to the wetneſs of the ſituation in which he reſides. I have now before me a ſeed pod of the Orchis, the contents of which to the naked eye, ſeem to be ſeed corrupted and turned to duſt, but when viewed through a microſcope appear evidently to be organized, and would I doubt not with proper culture germinate, and produce a thriving crop of plants. The propereſt time for gathering the roots is when the

ſeed

ſeed is formed, and the ſtalk is ready to fall, becauſe the new bulb, of which the ſalep is made, is then arrived to its full maturity, and may be diſtinguiſhed from the old one, by a white bud riſing from the top of it, which is the germ of the Orchis of the ſucceeding year.

SEVERAL methods of preparing ſalep have been propoſed and practiſed. Geoffroy has delivered a very judicious proceſs for this purpoſe, in the *Hiſtoire de l' Academie Royale des Sciences* 1740; and Retzius, in the Swediſh Tranſactions 1764, has improved Geoffroy's method. But Mr. Moult of Rochdale has lately favoured the public with a new manner of curing the Orchis root, and as I have ſeen many ſpecimens of his ſalep, at leaſt equal if not ſuperior to any brought from the Levant, I can recommend the following, which is his proceſs, from my own knowledge of its ſucceſs.

The new root is to be waſhed in water, and the fine brown ſkin which covers it is to be ſeparated by means of a ſmall bruſh, or by dipping the root in hot water, and rubbing it with a coarſe linen cloth. When a ſufficient number of roots have been thus cleaned, they are to be ſpread on a tin plate, and placed in an oven heated to the uſual degree, where they are to remain ſix or ten minutes, in which time they will have loſt their milky whiteneſs, and acquired a tranſparency like horn, without any diminution of bulk. Being arrived at this ſtate they are to be removed, in order to dry and harden in the air, which will require ſeveral days to effect; or by uſing a very gentle heat, they may be finiſhed in a few hours. *(a)*

SALEP thus prepared, may be afforded in this part of England, where labour bears

(a) Vid. a Letter from Mr. John Moult to the Author, containing a new method of preparing Salep. Phil. Tranſact. Vol. 59.

bears a high value, at about eight pence or ten pence per pound. And it might be ſold ſtill cheaper, if the Orchis were to be cured, without ſeparating from it the brown ſkin which covers it: A troubleſome part of the proceſs, and which does not contribute to render the root, either more palatable or ſalutary. Whereas the foreign ſalep is now ſold at five or ſix ſhillings per pound.

THE culture of the Orchis therefore is an object highly deſerving of encouragement, from all the lovers of agriculture. And as the root, if introduced into common uſe, would furniſh a cheap, wholeſome, and moſt nutritious article of diet, the growth of it would be ſufficiently profitable to the farmer.

SALEP is ſaid to contain the greateſt quantity of vegetable nouriſhment in the ſmalleſt bulk. Hence a very judicious writer, to prevent the dreadful calamity

of

of famine at ſea, has lately propoſed that the powder of it ſhould conſtitute part of the proviſions of every ſhip's company. This powder and portable ſoup, diſſolved in boiling water, form a rich thick jelly, capable of ſupporting life for a conſiderable length of time. An ounce of each of theſe articles, with two quarts of boiling water, will be ſufficient ſubſiſtence for a man a day *(b)*; and as being a mixture of animal, and vegetable food, muſt prove more nouriſhing than double the quantity of rice cake, made by boiling rice in water; this laſt however ſailors are often obliged ſolely to ſubſiſt upon for ſeveral months, eſpecially in voyages to Guinea, when the bread and flour are exhauſted, and the beef and pork, having been ſalted in

(b) Portable ſoup is ſold at half a crown per pound; ſalep, if cultivated in our own country, might be afforded at ten pence per pound; the day's ſubſiſtence would therefore amount only to two pence halfpenny.

in hot countries, are become unfit for uſe.*

But as a wholeſome nouriſhment, rice is much inferior to ſalep. I digeſted ſeveral alimentary mixtures prepared of mutton and water, beat up with bread, ſea biſcuit, ſalep, rice flour, ſago powder, potato, old cheeſe, &c. in a heat equal to that of the human body. In forty-eight hours they had all acquired a vinous ſmell, and were in briſk fermentation, except the mixture with rice, which did not emit many air bubbles, and was but little changed. The third day ſeveral of the mixtures were ſweet, and continued to ferment; others had loſt their inteſtine motion, and were ſour; but the one which contained the rice was become putrid. From this experiment it appears that rice as an aliment, is ſlow of fermentation,

* Vid. Dr. Lind's Appendix to his Eſſay on the Diſeaſes of Hot Climates.

mentation, and a very weak corrector of putrefaction. It is therefore an improper diet for hoſpital patients; but more particularly for ſailors, in long voyages, becauſe it is incapable of preventing, and will not contribute much to check the progreſs of that fatal diſeaſe, the ſea ſcurvy. *(c)* Under certain circumſtances rice ſeems diſpoſed of itſelf, without mixture, to become putrid. For by long keeping it ſometimes acquires an offenſive fœtor. Nor can it be conſidered as a very nutritive kind of food, on account of its difficult ſolubility in the ſtomach. Experience confirms the truth of this concluſion;

(c) CHEESE is now become a conſiderable article of ſhip proviſions. When mellowed by age it ferments readily with fleſh and water, but ſeparates a rancid oil, which ſeems incapable of any further change, and muſt, as a ſeptic, be pernicious in the ſcurvy. For rancidity appears to be a ſpecies of putrefaction. The ſame objection may be urged, with ſtill greater propriety, againſt the uſe of cheeſe in hoſpitals; becauſe convaleſcents are ſo liable to relapſes, that the ſlighteſt error of diet may occaſion them. Vid. Percival's Letter to Mr. Aikin, Thoughts on Hoſpitals, p. 95.

on; for it is obſerved by the planters in the Weſt-Indies, that the negroes grow thin, and are leſs able to work, whilſt they ſubſiſt upon rice.

SALEP has the ſingular property of concealing the taſte of ſalt water *(d)*; a circumſtance of the higheſt importance at ſea, when there is a ſcarcity of freſh water. I diſſolved a drachm and a half of common ſalt in a pint of the mucilage of ſalep, ſo liquid as to be potable, and the ſame quantity in a pint of ſpring water. The ſalep was by no means diſagreeable to the taſte, but the water was rendered extremely unpalatable.

THIS experiment ſuggeſted to me the trial of the Orchis root as a corrector of acidity, a property which would render it a very uſeful diet for children. But the ſolution of it, when mixed with vinegar,

(d) Vid. Dr. Lind's Appendix.

negar, ſeemed only to dilute, like an equal proportion of water, and not to cover its ſharpneſs.

SALEP however appears by my experiments, to retard the acetous fermentation of milk, and conſequently would be a good lithing for milk pottage, eſpecially in large towns, where the cattle being fed upon ſour draft, muſt yield aceſcent milk.

SALEP in a certain proportion, which I have not yet been able to aſcertain, would be a very uſeful and profitable addition to bread. I directed one ounce of the powder to be diſſolved in a quart of water, and the mucilage to be be mixed with a ſufficient quantity of flour, ſalt, and yeaſt. The flour amounted to two pounds, the yeaſt to two ounces, and the ſalt to eighty grains. The loaf when baked was remarkably well fermented, and weighed three pounds two ounces.

Another

Another loaf, made with the ſame quantity of flour, &c. weighed two pounds and twelve ounces; from which it appears, that the ſalep, though uſed in ſo ſmall a proportion, increaſed the gravity of the loaf ſix ounces, by abſorbing and retaining more water than the flour alone was capable of. Half a pound of flour, and an ounce of ſalep were mixed together, and the water added according to the uſual method of preparing bread. The loaf when baked weighed thirteen ounces and a half; and would probably have been heavier, if the ſalep had been previouſly diſſolved in about a pint of water. But it ſhould be remarked, that the quantity of flour uſed in this trial was not ſufficient to conceal the peculiar taſte of the ſalep.

The reſtorative, mucilaginous, and demulcent qualities of the Orchis root render it of conſiderable uſe in various diſeaſes. In the ſea ſcurvy it powerfully obtunds

obtunds the acrimony of the fluids, and at the ſame time is eaſily aſſimulated into a mild and nutritious chyle. In diarrhœas and the dyſentery it is highly ſerviceable, by ſheathing the internal coat of the inteſtines, by abating irritation, and gently correcting putrefaction. In the ſymptomatic fever, which ariſes from the abſorption of pus, from ulcers in the lungs, from wounds, or from amputation, ſalep uſed plentifully is an admirable demulcent, and well adapted to reſiſt that diſſolution of the *craſis* of the blood, which is ſo evident in theſe caſes. And by the ſame mucilaginous quality, it is equally efficacious in the ſtrangury, and dyſury; eſpecially in the latter when ariſing from a venereal cauſe, becauſe the diſcharge of urine is then attended with the moſt exquiſite pain, from the ulcerations about the neck of the bladder, and through the courſe of the *urethra*. I have found it alſo an uſe-

ful

ful aliment for patients who labour under the ſtone or gravel. *(e)*

FROM theſe obſervations, ſhort and imperfect as they are, I hope it will ſufficiently appear that the culture of the Orchis root is an object of conſiderable importance

(e) THE ancient chemiſts ſeem to have entertained a very high opinion of the virtues of the Orchis root, of which the following quotation from the SECRETA SECRETORUM of Raymund Lully, affords a diverting proof. The work is dated 1565.

SEXTA HERBA,

Satirion.

" SATIRION herba eſt pluribus nota, hujus radicis collecta ad pondus lib. 4. die 20 menſis Januarij, contunde fortiter & maſſam contuſam pone in ollam de aurichalcum habente in cooperculo 20 foramina minuta ficut athomi, & pone intus cù prædicta meſſa lactis vaccini calidi ficut mulgetur de vacca ℔. 3. & mellis libram 1. vini aromatici ℔. 2. & repone per dies 20. ad ſolem & conſerua & utere."

" Iſtius itaq; doſis ad pondus 3. 4. & hora diei decima exhibita mulieri poſt ipſius menſtrua eadem nocte còcipiet ſi vir cum ea agat."

importance to the public, and highly worthy of encouragement from all the patrons of agriculture. That taſte for experiment, which characteriſes the preſent age, and which has ſo amazingly enlarged the boundaries of ſcience, now animates the RATIONAL FARMER, who fears not to deviate from the beaten track, whenever improvements are ſuggeſted, or uſeful projects are pointed out to him. Much has been already done for the advancement of agriculture; but the earth ſtill teems with treaſures which remain to be explored. The bounties of nature are inexhauſtible, and will forever employ the art, and reward the induſtry of man.

MISCEL-

MISCELLANEOUS

EXPERIMENTS

AND

OBSERVATIONS.

—— *Alij hinc ſaltem, hac data via, felicioribus freti ingenijs, rei rectius gerendæ et melius inquirendi occaſionem capiant.*

G. Harveij. Op.

EXPERIMENTS AND OBSERVATIONS ON THE WATERS OF BUXTON AND MATLOCK, In DERBYSHIRE.

THE water of St. Ann's well at BUXTON, is found, by analyſis, to contain calcareous earth, foſſil alkali, and ſea ſalt; but in very ſmall proportions. For a gallon of the water, when evaporated, yields only twenty-three or twenty-four grains of ſediment. It ſtrikes a ſlight green colour with ſyrup of violets, ſuffers no change from an infuſion of galls, from the fixed vegetable alkali, or from the

mineral acids; becomes milky with the volatile alkali, and with *ſaccharum ſaturni*; and lets fall a precipitate on the addition of a few drops of a ſolution of ſilver, in the nitrous acid. The ſpecific gravity of this water is preciſely equal to that of rain water, when their temperatures are the ſame; but it weighs four grains in a pint lighter, when firſt taken from the ſpring. The temperature of the bath is about 82 degrees of Farenheit's thermometer; that of St. Ann's well, as it is a ſmaller body of water, and expoſed to the open air, is ſomewhat leſs. The water is tranſparent, ſparkling, and highly grateful to the palate. *(a)*

In October 1769, I paſſed a few days at Buxton; and during my ſtay there amuſed myſelf with the following experiments

(a) I am indebted to the information of the judicious and worthy Phyſician, who attends at Buxton, for ſome of theſe facts.

ments on the effects of the water of St. Ann's well on my pulſe.

EXPERIMENT I.

October 12th. EIGHT o'clock in the morning. The day cold and moiſt. My pulſe beat 84 ſtrokes in a minute. I drank at the well the third of a pint of water, and uſing every neceſſary precaution, examined my pulſe at certain intervals of time. In five minutes pulſe 80. In ten minutes pulſe 80, fuller and harder. In twenty minutes pulſe 85. In half an hour pulſe 90.

EXPERIMENT II.

ELEVEN o'clock a. m. Two hours after breakfaſt. The air warm and ſerene. Pulſe 90. I repeated the draught of water. In ſeven minutes pulſe 109. In fifteen minutes pulſe 103. In thirty mi-

nutes pulſe 100. Head ach. In an hour and a half pulſe 95. Head ach abated.

EXPERIMENT III.

October 13th. EIGHT o'clock in the morning. The day cold. Pulſe 92. I drank the quantity of water above-mentioned. In five minutes pulſe 86. In fifteen minutes pulſe 86, full and hard. In twenty minutes pulſe 100. In half an hour pulſe 92.

FROM the firſt and third experiments it appears that the coldneſs of the morning counteracted, for a time, the effects of the Buxton water, and reduced the vibrations of my pulſe from 84 to 80, and from 92 to 86. But the ſtimulus of the water ſoon became ſuperiour to the ſedative powers of the cold to which I was expoſed; for within the ſpace of half an hour my pulſe roſe to 90 in the firſt, and

to 100 ſtrokes in the ſecond trial. At eleven o'clock before noon, when the air was warm and ſerene, the water in a much ſhorter time exerted its full force, increaſing the velocity of my pulſe from 90 to 109 vibrations in a minute.

THESE experiments evince the heating quality of Buxton water, and ſuggeſt to us the precautions to be obſerved in the uſe of it. Small quantities only ſhould be drunk at once, and frequently repeated; the belly ſhould be kept ſoluble with lenitive electuary, or any other mild purgative; and at the beginning of the courſe, the patient may be directed to ſuffer the water to remain a few ſeconds in the glaſs, before he ſwallows it. For this celebrated ſpring abounds with a mineral ſpirit, or mephitic air, in which its ſtimulus, and indeed its efficacy reſides, and which is quickly diſſipated by expoſure to the air.

THE

THE hon^ble. and ingenious Mr. Cavendiſh has ſhewn, by his Experiments on Rathboneplace water, Philoſ. Tranſact. vol. 57, that calcareous earths may be rendered ſoluble in water, by furniſhing them with more than their natural proportion of fixed air. And it has lately been diſcovered that iron alſo may be ſuſpended by this principle, in the ſame *menſtruum*. *(b)* It appeared, therefore, highly probable to me, that a chalybeate impregnation might, with great facility, be communicated to the Buxton water, when freſh drawn from the ſpring; a quality which in many caſes would add greatly to its medicinal efficacy. I ſuggeſted the trial to Mr. Buxton, a worthy and ſenſible Apothecary near the wells, who has lately, at my requeſt, made the following experiment.

EXPE-

(b) Vid. Mr. Lane's Experiments, Phil. Tranſ. vol. 59.

EXPERIMENT IV.

A QUART bottle, containing two drachms of iron filings, was filled by immerſion, with the water of St. Ann's well, corked and agitated briſkly under the ſurface of the water. It was then ſuffered to remain in the well till the filings had ſubſided, when the water was carefully decanted into a half pint glaſs. To this were added three drops of the tincture of galls, which immediately occaſioned a deep purple colour; and the tranſparency was preſently reſtored, by a few drops of the acid of vitriol; evident proofs that a ſolution of the iron was effected in a few minutes. The water alſo, without the tincture of galls, had a chalybeate taſte, and left an agreeable aſtringency upon the palate.

BY this experiment it appears that a warm chalybeate, abounding with a mineral

neral ſpirit, and grateful to the taſte, may with very little trouble be obtained. And this method of impregnating the Buxton water with iron, muſt increaſe its tonic powers, and in many caſes improve its medicinal virtues. It is a common practice to join the uſe of a chalybeate ſpring, in the neighbourhood of St. Ann's well, with that of the Buxton water. But the ſuperiority of this artificial mineral water muſt be apparent, if we conſider its agreeable warmth, volatility, levity, and grateſulneſs to the palate.

Buxton bath is very frequently employed as a temperate cold bath. For as the heat of the water is ſixteen or eighteen degrees below that of the human body, a gentle ſhock is produced on the firſt immerſion, the heart and arteries are made to contract more powerfully, and the whole ſyſtem is braced and invigorated. But this ſalutary operation muſt be greatly diminiſhed, often indeed more than

than counterbalanced, by the relaxing vapours which copiouſly exhale from the bath, to which the patients are expoſed during the time of dreſſing and undreſſing. A ſeparate room is indeed provided for the ladies; but the gentlemen have no other accommodations than what the vault affords in which the bath is contained, and are therefore liable to all the inconveniences which ariſe from warmth and moiſture.

June 12th, 1772. The mercury in Farenheit's thermometer ſtood in the ſhade at 65; but in this vault quickly roſe to 78 degrees.

EXPE-

EXPERIMENTS

ON

MATLOCK WATER.

EXPERIMENT I.

A Thermometer made by Dollond, and graduated according to Farenheit's ſcale, was expoſed for a ſufficient length of time to the ſtream of water as it guſhes out of the rock, and alſo immerſed in the baſon which receives it. The mercury roſe to 66 degrees.

EXPERIMENT II.

Six drops of *ſp. ſal. ammon. vol.* were poured into a glaſs of the ſpring water, which

which contained about the ſixth of a pint; a very ſlight cloudineſs immediately enſued; but no precipitation was afterwards obſervable.

EXPERIMENT III.

Six drops of a ſolution of ſalt of tartar occaſioned a cloudineſs juſt perceptible, in the ſame quantity of water. No precipitation enſued.

EXPERIMENT IV.

Six drops of a ſolution of *ſaccharum ſaturni* immediately produced a milkineſs in the water, but no ſenſible precipitation.

EXPERIMENT V.

Six drops of a ſolution of ſilver in the nitrous acid inſtantly occaſioned a milkineſs in the water; and after ſtanding an hour, a grey powder was obſervable at the bottom of the glaſs.

EXPE-

EXPERIMENT VI.

TEN drops of the infuſion of galls neither produced any change of colour in the water at the time they were added, nor was the ſlighteſt purple hue perceptible two hours afterwards.

EXPERIMENT VII.

A PIECE of paper beſmeared with freſh ſyrup of violets was dipped into a glaſs full of water. No change of colour enſued.

EXPERIMENT VIII.

ANOTHER piece of paper, moiſtened in the ſame manner with the ſyrup, was placed over a glaſs of water, as ſoon as it was taken from the ſpring. The paper ſuffered no change of colour, although it remained an hour upon the glaſs.

EXPE-

EXPERIMENT IX.

My pulſe beat 84 ſtrokes in a minute at the time when I drank a half pint glaſs of the Matlock water. In twenty minutes my pulſe roſe to 88. In half an hour they ſunk to 82; and continued to vibrate the ſame number of times for an hour, which was as long as I thought it neceſſary to examine them.

EXPERIMENT X.

The mercury in Farenheit's thermometer, when immerſed in each of the baths ſtood at 68; in the river Derwent, which flows through the valley of Matlock, at 52. Theſe experiments were made on the 12th of June 1772, and the weather was warm.

EXPERIMENT XI.

A four once phial, after being accurately counterpoiſed in a very nice balance, was filled to the brim with diſtil-

led water, which weighed three ounces, four drachms, forty-five grains and a half. The ſame phial, exactly balanced as before, was then filled to the brim with Matlock water of the ſame temperature with the diſtilled water, which weighed three ounces, four drachms and forty-ſix grains.

MATLOCK water is grateful to the palate, and of an agreeable warmth, but exhibits no marks of any mineral ſpirit, either by its taſte, ſparkling appearance in the glaſs, or by the chemical teſt employed in experiment VIII. The ſecond and third experiments ſhew, that it is very ſlightly impregnated with *ſelenites*, or other earthy ſalts; and of this its comparative levity affords alſo a further proof. For it weighs twenty-ſix grains in a pint lighter than the Mancheſter pump water, *(a)* and only four grains heavier than diſtilled water.

(a) Vid. the Author's Treatiſe on the Pump Water of Mancheſter, Eſſays Medical and Experimental, p. 287, 2d. Edit.

water. The precipitation of a grey powder by the addition of a ſolution of ſilver in *aqua fortis* to the water, renders it probable that a ſmall portion of ſea ſalt is contained in it. For the powder is found to conſiſt of the particles of ſilver combined with the muriatic acid, which is ſeparated from the foſſil alkali by the ſuperior affinity the nitrous acid bears to it; and thus a double elective attraction takes place in this experiment.

This water has been ſaid to contain iron. But the aſſertion is at leaſt rendered doubtful by the ſixth experiment, which was made with the utmoſt accuracy; and I am inclined to think that it is entirely without foundation. The ſpring is juſtly celebrated for its efficacy in hæmoptoes; and hence it may have been too haſtily concluded that it poſſeſſes ſome ſlight degree of ſtypticity, by means of a chalybeate impregnation.

The ninth experiment, which my ſhort

ſtay at Matlock would not allow me leiſure to repeat, affords a preſumption, that the water is not poſſeſſed of any ſtimulating powers. For the ſmall increaſe of quickneſs in my pulſe on drinking half a pint of it, may be aſcribed more to the qnantity received into the ſtomach, than to the heating quality of the water.

THE Briſtol and Matlock waters appear to reſemble each other both in their chemical and medicinal qualities. I have examined and compared them together by the teſts mentioned above; and ſo far as ſuch trials may be deemed concluſive, there ſeems to be no other than the following ſlight difference between them. The Briſtol water becomes a little more milky on the addition of a ſolution of fixed alkali, and of *ſaccharum ſaturni*, than that of Matlock. The former alſo weighs near a grain in a pint heavier than the latter. Is it not to be lamented therefore that ſo little attention is paid to Matlock, even by the Phyſicians who reſide in the neigh-

neighbourhood of it? In hectic cases, hæmoptoes, the diabetes, and other diſorders in which the circulation of the blood is rapid and irregular, I ſhould apprehend that Matlock water, on ſome accounts, claims the preference to that of Briſtol. For as it is not ſenſibly impregnated with any mineral ſpirit, it ſhould ſeem to be leſs diſpoſed to quicken the pulſe, and may therefore be drunk in larger quantities. But it muſt be acknowledged that the climate of Briſtol is ſuperior to that of Matlock; a circumſtance of the higheſt importance to conſumptive patients. Situated in a deep though delightful valley, and ſurrounded by very high mountains, the ſun diſappears at Matlock earlier in the evening, the fogs are longer in diſperſing, and it may be preſumed that rain falls here more frequently and copiouſly, than in other places. For at Chatſworth, which is encompaſſed alſo with hills, and is about ten miles diſtant, in 1764, 1765, 1767, and 1768, about thirty-three inches of rain at a medium fell each year.

THE following Table exhibits a comparative view of the different temperatures of Bath, Buxton, Briſtol, and Matlock waters, meaſured by Farenheit's thermometer.

*BATH.

King's Bath Pump - -	112°.
Hot Bath Pump - -	114½.
Croſs Bath Pump - -	110.

*BRISTOL.

Hot Well Pump - -	76.

BUXTON.

Bath - - -	82.
St. Ann's Well - -	81+.

MATLOCK.

Baths - - -	68.
Spring - - -	66.

*Vid. Mr. Canton's Experiments, Phil. Tranſ. vol. 57. page 203.

ON THE MEDICINAL USES OF FIXED AIR.

IN a courſe of experiments, which is yet too unfiniſhed to lay before the public, I have had frequent opportunities of obſerving that fixed air may, in no inconſiderable quantity, be breathed without danger or uneaſineſs. And it is a confirmation of this concluſion, that at Bath, where the waters copiouſly exhale this mineral ſpirit, *(a)* the bathers inſpire

(a) See Dr. Falconer's very uſeful and ingenious Treatiſe on the Bath Waters, 2d. Edit. p. 313.

it with impunity. At Buxton alſo, where the bath is in a cloſe vault, the effects of ſuch *effluvia*, if noxious, muſt certainly be perceived.

ENCOURAGED by theſe conſiderations, and ſtill more by the teſtimony of a very judicious Phyſician at Stafford in favour of this powerful antiſeptic remedy, I have adminiſtered fixed air in more than thirty caſes of the PHTHISIS PULMONALIS, by directing my patients to inſpire the ſteams of an efferveſcing mixture of chalk and vinegar, through the ſpout of a coffee-pot. The hectic fever has in ſeveral inſtances been conſiderably abated, and the matter expectorated has become leſs offenſive and better digeſted. I have not yet however been ſo fortunate in any one caſe, as to effect a cure; although the uſe of mephitic air has been accompanied with proper internal medicines. But Dr. Withering, the gentleman referred to above, informs me, that he has been more ſucceſsful. One phthiſical patient under his

his care, has by a ſimilar courſe entirely recovered; another was rendered much better; and a third, whoſe caſe was truly deplorable, ſeemed to be kept alive by it more than two months. It may be proper to obſerve, that fixed air can only be employed, with any proſpect of ſucceſs, in the latter ſtages of the *phthiſis pulmonalis*, when a purulent expectoration takes place. After the rupture and diſcharge of a VOMICA alſo, ſuch a remedy promiſes to be a powerful palliative. Antiſeptic fumigations and vapours have been long employed, and much extolled in caſes of this kind. I made the following experimont to determine whether their efficacy, in any degree, depends on the ſeparation of fixed air, from their ſubſtance.

ONE end of a bent tube was fixed in a phial full of lime water; the other end in a bottle of the tincture of myrrh. The junctures were carefully luted, and the phial containing the tincture of myrrh was

was placed in water, heated almoſt to the boiling point, by the lamp of a tea-kettle. A number of air bubbles were ſeparated, but probably not of the mephitic kind, for no precipitation enſued in the lime water. This experiment was repeated with the *tinct. tolutana, Ph. Ed.* and with *ſp. vinos. camph.* and the reſult was entirely the ſame. The medicinal action therefore of the vapours raiſed from ſuch tinctures, cannot be aſcribed to the extrication of fixed air; of which it is probable bodies are deprived by *chemical ſolution* as well as by *mixture*.

If mephitic air be thus capable of correcting purulent matter in the lungs, we may reaſonably infer it will be equally uſeful when applied externally to foul ULCERS. And experience confirms the concluſion. Even the ſanies of a CANCER, when the carrot poultice failed, has been ſweetened by it, the pain mitigated, and a better digeſtion produced. The caſes I refer to are now in the Mancheſter Infirmary,

Infirmary, under the direction of my friend Mr. White, whoſe ſkill as a ſurgeon, and abilities as a writer are well known to the public.

Two months have elapſed ſince theſe obſervations were written, *(a)* and the ſame remedy, during that period, has been aſſiduouſly applied, but without any further ſucceſs. The progreſs of the cancers ſeems to be checked by the fixed air; but it is to be feared, that a cure will not be effected. A palliative remedy, however, in a diſeaſe ſo deſperate and loathſome, may be conſidered as a very valuable acquiſition. Perhaps NITROUS AIR might be ſtill more efficacious. This ſpecies of factitious air is obtained from all the metals, except zinc, by means of the nitrous acid; and Dr. Prieſtley informs me, that as a ſweetener and antiſeptic it far ſurpaſſes fixed air. He put two mice into a quantity of it, one juſt killed, the other offenſively putrid. After twenty-five days they were both perfectly ſweet.

IN

(a) May, 1772.

IN the ULCEROUS SORE THROAT much advantage has been experienced from the vapours of effervescing mixtures, drawn into the *fauces*. *(a)* But this remedy should not supersede the use of other antiseptic applications. *(b)*

IN MALIGNANT FEVERS, wines abounding with fixed air may be administered, to check the septic ferment, and sweeten the putrid *colluvies* in the *primæ viæ*. If the laxative quality of such liquors be thought an objection to the use of them, wines of a greater age may be given, impregnated with mephitic air, by a simple but ingenious contrivance of my learned friend Dr. Priestley, which will very soon be laid before the public. *(c)*

The

(a) Vid. Mr. White's useful Treatise on the Management of Pregnant and Lying-in Women, p. 279.

(b) See the Author's Observations on the efficacy of external applications in the Ulcerous Sore Throat, Essays Med. and Experimental, 2d. Edit. p. 377.

(c) DIRECTIONS for impregnating water with fixed air, in order to communicate to it the peculiar spirit and virtues of Pyrmont water, and other mineral waters of a similar nature; by Joseph Priestley, L. L. D. F. R. S.

The patients common drink might alſo be medicated in the ſame way. A putrid *diarrhœa* frequently occurs in the latter ſtage of ſuch diſorders; and it is a moſt alarming and dangerous ſymptom. If the diſcharge be ſtopped by aſtringents, a putrid *fomes* is retained in the body, which aggravates the delirium, and increaſes the fever. On the contrary, if it be ſuffered to take its courſe, the ſtrength of the patient muſt ſoon be exhauſted, and death unavoidably enſue. The injection of mephitic air into the inteſtines, under theſe circumſtances, bids fair to be highly ſerviceable. And a caſe of this deplorable kind has lately been communicated to me, in which the vapour of chalk and oil of vitriol, conveyed into the body, by the machine employed for tobacco clyſters, quickly reſtrained the *diarrhœa*, corrected the heat and fetor of the ſtools, and in two days removed every ſymptom of danger. A ſimilar inſtance of the ſalutary effects of mephitic air, thus adminiſtered, has occurred alſo in

my

my own practice; the history of which I shall probably lay before the public. May we not presume that the same remedy would be equally useful in the DYSENTERY? The experiment is at least worthy of trial.

THE use of wort, from its saccharine quality, and disposition to ferment, has lately been proposed as a remedy for the SEA SCURVY. Water, or other liquors already abounding with fixed air in a separate state, should seem to be better adapted to this purpose, as they will more quickly correct the putrid disposition of the fluids, and at the same time, by their gentle stimulus *(a)*, increase the powers of digestion, and give new strength to the whole system. Dr. Priestley, whose inventive genius suggested both the idea, and the means of executing it, has, under the sanction of the College of Physicians, proposed

(a) THE vegetables, which are most efficacious in the cure of the scurvy, possess some degree of a stimulating power.

propoſed the ſcheme to the Lords of the Admiralty, who have ordered trial to be made of it, on board ſome of his Majeſty's ſhips of war. Might it not, however, give additional efficacy to this remedy, if inſtead of ſimple water, the infuſion of malt were to be employed?

I AM perſuaded ſuch a medicinal drink might be preſcribed alſo with great advantage in ſcrophulous complaints, and other diſorders in which a general acrimony prevails, and the *craſis* of the blood is deſtroyed. Under ſuch circumſtances I have ſeen *vibices*, which ſpread over the body, diſappear in a few days, from the uſe of wort.

A GENTLEMAN, who is ſubject to a ſcorbutic eruption in his face, for which he has uſed a variety of remedies with no very beneficial effect, has lately applied the fumes of chalk and oil of vitriol to the parts affected. The operation occaſions great itching and prickling in the ſkin,

ſkin, and ſome degree of drowſineſs, but evidently abates the ſerous diſcharge, and diminiſhes the eruption. This patient has ſeveral ſymptoms which indicate a genuine ſcorbutic *diatheſis*; and it is probable that fixed air taken internally would be a uſeful medicine in his caſe.

The ſaline draughts of Riverius are ſuppoſed to owe their antiemetic effects to the air, which is ſeparated from the ſalt of wormwood, during the act of effervescence. And the tonic powers of many mineral waters ſeem to depend on the ſame principle. But I ſhall exceed my deſign by enlarging further on this ſubject. What has been advanced, it is hoped, will ſuffice to excite the attention of Phyſicians to a remedy, which is capable of being applied to ſo many important medicinal purpoſes.

ON THE ANTISEPTIC AND SWEETENING POWERS, AND ON THE VARIETIES OF FACTITIOUS AIR.

THOUGH the fact has lately been controverted by an ingenious writer, I am fully convinced with Dr. Macbride, from the evidence of repeated experiments, that fixed air has the property both of retarding and of correcting putrefaction. It may afford matter of amuſement, to conſider in what manner theſe effects are produced.

THAT fixed air may reſtrain, and even prevent putrefaction, without poſſeſſing any inherent antiſeptic quality, is not difficult to conceive. For by ſurrounding the putreſcent ſubſtance with that kind of air,

which it yields by putrefaction, and which requires ſome vehicle to diſcharge or carry it off, the ſeparation of it is prevented, and the body thus retained in its original ſtate. This may be illuſtrated by a wet ſponge or cloth, which will never become dry in an atmoſphere ſaturated with moiſture. Or ſtill more appoſitely by putting a mixture of ſulphur and iron filings in a confined place, or in air in which candles have burned out. Under theſe circumſtances, no heat, efferveſcence, or fume can be generated; whereas the ſame mixture in freſh air preſently grows hot, ſmokes copiouſly, and ſmells very offenſively. *(a)* The ſame obſervation will account for the curious fact mentioned by Dr. Alexander, that the *effluvia* of putrid ſubſtances retard putrefaction in the bodies expoſed to them. Perhaps, however, the generation of a volatile alkali may have ſome ſhare in producing this effect.

But

(a) See Doctor Prieſtley's moſt ingenious papers on factitious air, which will probably be publiſhed in the 62d. vol. of the Philoſophical Tranſactions.

But ſuppoſing the foregoing hypotheſis to be well founded, which I advance only as conjecture, how are we to explain the ſweetening powers of fixed air? An eminent philoſopher ſeems to hint that fixed air may act as a *menſtruum* for the putrid *effluvium*, and thus imbibe or diſcharge it from the ſeptic body. The ſame idea ſuggeſted itſelf to Mr. Henry, in conſequence of the following experiment, to which I was a witneſs. A piece of putrid fleſh was ſuſpended twelve hours, in a three pint bottle cloſely corked, and filled with fixed air, which had been ſeparated from chalk by the vitriolic acid. The beef was conſiderably ſweetened, but the air in the bottle was rendered intolerably offenſive. Now it affords a natural ſolution of this fact, if we admit that fixed air, by the laws of chemical affinity, abſtracts from the ſeptic body, and holds ſuſpended or diſſolved the putrid particles which it emits. And ſuch an affinity ſeems probable, from their ready com-

 bination,

bination, as well as from their diſpoſition to fly off together from putrefying ſubſtances. But how is the putrefactive proceſs checked, and the freſh generation of *effluvia* reſtrained under ſuch circumſtances? A piece of the ſame fleſh, which was employed in the foregoing experiment, was left all night in the external air, by the circulation of which the *effluvia* could not fail to be carried off as they were formed; yet the offenſive odour of the fleſh was not diminiſhed. Has not the reaſon of this difference, between the expoſure of a putrid ſubſtance to common air, and to mephitic air, been before aſſigned, when it was ſuggeſted that the latter may perhaps reſtrain the flight of that principle in bodies, the ſeparation of which conſtitutes an eſſential part of the proceſs of putrefaction? Animal fleſh will neither become putrid in *vacuo*, nor when cloſely confined from the acceſs of common air. In both caſes a vehicle is wanting for the eſcape of the mephitic air.

air. In like manner red hot wood ceaſes to burn, in inflammable air, becauſe ſuch air is already ſaturated with phlogiſton.

I HAVE advanced the preceding conjectures, concerning the manner in which fixed air may retard and correct putrefaction, not as affording me full conviction, or to indulge a fanciful hypotheſis, but to promote the further inveſtigation of a ſubject ſo curious and intereſting.

EXPERIMENT I.

IT is a fact lately aſcertained by a very accurate Philoſopher, that putrefaction generates air ſimilar to that which animals have breathed. But this and the ſucceeding experiment ſhews that there is ſome little diverſity in their properties and effects. Air was blown forcibly from the lungs, for a ſufficient length of time, into a phial containing diſtilled water and iron filings. The water was then filter-

ed, and a few drops of the infuſion of galls were added to it. A dark red colour, inclining to purple, was inſtantly produced.

*EXPERIMENT II.

EIGHT ounces of ox gall were poured into a bottle, which had a tube communicating with another phial, containing half an ounce of iron filings, and four ounces of diſtilled water. After ſtanding two days, part of the water was filtered, and ſuffered no change of colour from the addition of an aſtringent tincture. But the next day, when the fermentation in the gall was more evident, another filtered portion of the water ſtruck with the ſame tincture a deep roſy red. On the fifth and ſixth days, when the gall became intolerably putrid, though the vapour ſtill corroded the iron filings, it ſeemed to have loſt

* Communicated by Dr. Falconer of Bath.

loſt the power of diſſolving them. For the aſtringent tincture no longer produced any change of colour in the water, and the iron was evidently precipitated.

*EXPERIMENT III.

SOLUTIONS of iron in water, obtained by different kinds of fixed air, vary in the colours which they ſtrike with an infuſion of galls. When the vitriolic acid and foſſil alkali are employed, a black tinge is produced; when magneſia, or calcareous earths and the ſame acid are uſed, a purple hue is ſtruck; and when the air is ſupplied by fermentation, the artificial chalybeate is changed by galls into a roſy red.

EXPERIMENT IV.

AIR diſcharged from chalk by the vitriolic acid readily and perfectly combines

* By the ſame.

with water; but when ſeparated by the nitrous acid, the union is more difficult to be effected, and much leſs complete. And the artificial mineral water, made by the latter, is more pungent and ſparkling than by the former acid.

EXPERIMENT V.

FACTITIOUS AIR, ſeparated from ſteel filings by the vitriolic acid, neither occaſioned any precipitation in lime water, nor rendered the cauſtic fixed alkali mild. Whereas the air ſet free from chalk and magneſia, by the ſame acid, inſtantly produced a milkineſs in lime water, and reſtored to the cauſtic alkali the power of effervescence.

EXPERIMENT VI.

A PIECE of putrid mutton, which had been employed as a ſtandard in ſome other experiments, was divided into two equal

equal parts: One of theſe was ſuſpended by a thread in a phial, containing an efferveſcing mixture of chalk and dilute ſpirit of vitriol; the other in a ſimilar phial, with a mixture of iron filings and the ſame acid. The mouths of the phials were ſlightly ſtopped with folded paper; and a briſk fermentation took place in each of them. After being expoſed ſixteen hours to the air detached from theſe ſubſtances, the bits of mutton were taken out, and examined. They were both conſiderably firmer in their texture; and the one which had been ſuſpended over the efferveſcing mixture of chalk and oil of vitriol was entirely ſweetened; but the putrid fetor of the other was not in the leaſt degree corrected.

EXPERIMENT VII.

A PIECE of putrid fleſh was ſuſpended about half an hour over a mixture of iron filings and nitrous acid, and was perfectly

ly ſweetened. It had acquired a pungent and ſlightly acid ſmell, but remained firm and free from fetor when this odour was waſhed off. The water, in which the fleſh was waſhed, did not effervesce with *lixivium tartari*; nor did the vapour ariſing from the ſpirit of nitre and iron filings produce any change of colour in a paper covered with ſyrup of violets; preſumptive proofs that the ſweetneſs of the fleſh was not reſtored by any acid fumes.

The fixed air of metals ſeems, by ſome of theſe experiments, to be of a kind different from that which is contained in alkalis and calcareous earths. And conſequently the action of theſe ſubſtances as *fluxes*, cannot be explained on the principle of their reſtoring the air which had been loſt by calcination. Indeed there are other proofs that the reſuſcitation of calces does not depend on this cauſe. I have been aſſured by an able Chemiſt that he has repeatedly reſtored *minium* to its

its metalline ſtate, by the cauſtic alkali, aſſiſted by a proper degree of heat; and that ſeveral of the metals may be revived by the force of fire alone. It is true that a mild calcareous earth employed as a flux, is always rendered cauſtic by the operation. But this may be owing to the action of the fire, and not to the loſs of its air by elective attraction. Perhaps the operation of alkalis and calcareous earths as fluxes may depend on their abſorbing the matter which ſeems to be added to metallic ſubſtances by the proceſs of calcination, and which furniſhes ſuch an amazing increaſe of weight *(a)*? Inflammable bodies may produce the ſame effect, by volatilizing and carrying it off.

(a) ANTIMONY, when calcined, gains one eleventh part of its original weight; zinc one tenth; tin one ſixth; and lead, when converted into minium, one fourth.

*ON THE NOXIOUS VAPOURS OF CHARCOAL.

—— Sævamque exhala opacat mephitin.

Virgil. Æneid. lib. 7. 34.

THE accurate and ingenious Doctor Hales, has proved by a great variety of experiments, that air enters in a very considerable proportion into the composition of all bodies. That air thus combined, is in a fixed state, and contributes to form the union and firm connection of the constituent parts of bodies; and

* Communicated by Dr. Dobson of Liverpool.

and that on their deſtruction or decompoſition, this fixed air is again reſtored to its ſtate of elaſticity.

FIXED AIR, whether procured by fire, fermentation, or chemical reſolution, has been ſuppoſed to be a body *ſui generis*; and to poſſeſs properties, by which it is always diſtinctly characteriſed. It is more comformable however to the ſimplicity which is conſtantly obſerved in the operations of nature, to conclude, that as it is common atmoſpheric air which enters into the compoſition of bodies, it is likewiſe the ſame air which is again detached, on their decompoſition or deſtruction; that its varieties depend on adventitious matter; and that it has different degrees of mixture and compoſition, according as it is obtained from different ſubſtances, or by a different proceſs.

THAT by degrees however, it is decompounded; returns to its original ſimplicity;

plicity; is reſtored to the common magazine from which it was taken; and that the atmoſphere is thus conſtantly gaining by one proceſs, what it loſes by another.

FACTITIOUS or FIXED AIR is the general term, by which this ſubject is diſtinguiſhed; and when it produces any noxious effects, either in conſequence of the proceſs by which it is procured, or the manner in which it is applied, it may then be properly called MEPHITIC AIR.

MUCH has been done by ſome very ingenious modern writers, to illuſtrate this ſubject; and much ſtill remains to be done, to compleat the chemical and medical hiſtory of fixed air. The preſent commentary, chiefly reſpects the factitious air of charcoal; or the mephitic vapours which ariſe from this ſubſtance, in the ſtate of ignition. And the following hiſtory points out both the noxious qualities of theſe vapours, and their mode of action on the animal œconomy.

October

October 5th, 1769. A ſervant to a gentleman's family in Liverpool, ſhut himſelf up in a ſmall room to clean plate. In this room there was a chafing-diſh of burning charcoal, and the door and window were cloſed. He ſoon felt himſelf *very ill*, as he expreſſed it; was chilly, ſickiſh, and had ſhooting pains in the head. He continued to be affected in this manner for upwards of an hour and a half, during which time he had been twice called out, but returned again to the ſame ſituation in a few minutes. The chills, ſickneſs, and pain in the head became more ſevere, and were increaſed by fits; he retched, but could not vomit. Theſe were the only ſenſations he could recollect; and on my aſking him, whether he did not feel an oppreſſion at his breaſt, or a ſenſe of ſuffocation, he anſwered in the negative.

He remembered that he heard the clock ſtrike eleven, which was an hour and

and a half from his firſt going into the room; and ſtill finding himſelf very ill, but having no ſuſpicion of the cauſe, he leaned forwards, reſted his head upon his hands, and from that time had no further knowledge of what paſſed.

About half an hour after this, ſome of the family going near the door, were alarmed by his groans. The door was forced open, and he was found extended on the ground; his eyes fixed and ſtaring; his hands clenched; his arms, legs, and whole body rigid; and his countenance, which was naturally pale, had now a death-like appearance.

He was immediately carried into the open air; but it was with difficulty that his limbs were ſo bent that he could be ſeated in a chair. He continued to groan, and on the application of hartſhorn drops to his noſe, exerted a kind of motion, as if offended. Cold water thrown upon his face,

face, had a more powerful effect to rouſe him. After ten minutes, he came to himſelf; and in about twenty minutes, he was able to walk.

At this time I firſt ſaw him; he complained of pain in his head, coldneſs and ſickneſs; was hot to the touch; his pulſe, ſmall and frequent, 120 in a minute. While I was examining him, I obſerved his voice faultered; his eyes became fixed; he ſtaggered forwards, and would have fallen, had he not been ſupported. He was placed in a chair, and remained in a ſtate of inſenſibility near a minute; there was no rigidity, the colour of the countenance did not change, but the pulſe was extremely ſmall, frequent, and irregular. On coming to himſelf, he complained much of pain in his head, was ſick, retched, trembled, and was cold and hot by fits; a conſiderable degree of fever remained for two days, and then gradually left him.

We have here a fair opportunity of obſerving the effects of theſe noxious vapours. The patient was near two hours ſtruggling with the poiſon; and the whole progreſs of the ſymptoms clearly points out, an immediate affection of the brain and nervous ſyſtem, not of the lungs.

It is the common apprehenſion, that thoſe who are killed by the effluvia of burning charcoal, are *ſuffocated*; and this apprehenſion is ſupported by the authorities of ſome very diſtinguiſhed practical writers.

Morgagni, in his excellent work *de Sedibus et Cauſis Morborum*, aſſerts, that thoſe who die from the *ſteams of charcoal*, the ſteams of the fermenting grape, in the Grotto di Cani, and in the cavern of Pyrmont, are *ſuffocated*. *(a)*

Hoffman, in his Diſſertation *de fumo carbonum*

(a) Epiſt. 19. §. 40.

carbonum noxio, ſays, that theſe vapours being received into the breaſt, diſtend the lungs, prevent the admiſſion of air, and thus *ſuffocate*. *(b)* The mode of operation is expreſſed in very ſtrong terms. *Eadem enim horum operandi ratio eſt, ac ſi aſperam arteriam filo conſtringas; nam utroque horum aeris ſufficiens introitus impeditur. (c)*

Doctor Hales concludes, that the ſteams of the Grotto di Cani, and ſeveral other noxious vapours, deſtroy the elaſticity of the air, occaſion the veſicles of the lungs to collapſe, and thus *ſuffocate*, and cauſe ſudden death. *(d)*

Such are the reſpectable authorities which give weight to the common opinion, that thoſe who are killed by theſe noxious effluvia, are ſuffocated. The following experiments, hiſtories, and ob-

 ſervations,

(b) Hoffman, tom. 4. p. 697. 22. *(c)* Ib.
(d) Hale's Statics. p. 260, 261.

ſervations tend, however, to eſtabliſh a different doctrine.

We learn from the experiments of the celebrated Greenwood, that the air of a well, in which the men who went down periſhed, and in which a lighted torch was inſtantly extinguiſhed, did not differ from common air, either in gravity, humidity, or elaſticity. *(e)*

The ſame is found to be true of the Grotto di Cani. In this, the height of the mercury in the barometer was not altered by the deadly vapours. *(f)* And we have the ſame proof of the ſtate of the air in the cavern of Pyrmont. *(g)* It appears likewiſe from the experiments of the learned Leonardo Capuano, that thoſe animals which do *not breath*, are deſtroyed in the Grotto di Cani, though ſlowly and with more difficulty.*

Doctor

(e) Saggio delle Tranſar. tom. 5. p. 2.
(f) Mead. de Venenis, tent. 6.
(g) Commerc. litter. A. 1737. Heb. 8.
* Delle Moſette, Lez. 1.

Doctor Hales indeed proves, that the fumes of burning ſulphur, and the exhalations from the lungs of animals, bring into a fixed ſtate part of the air through which they are diſperſed, and conſequently diminiſh its elaſticity. That this circumſtance however is not the cauſe of death, is hence evident; in high winds and ſtorms, and on aſcending very high mountains, a greater diminution of elaſticity takes place, without ſuch fatal effects. †

All theſe noxious vapours, whether ariſing from burning charcoal, the fermenting grape, the Grotti di Cani, or the cavern of Pyrmont, operate nearly in the ſame manner. When accumulated and confined, their effects are often inſtantaneous; they immediately deſtroy the action of the brain and nerves, and in a moment arreſt the vital motions. When

† Veratti Com. Acad. Bonon. tom. ii. Pt. II. p. 271. 276, And Element. Phyſiolog. Haller. vol. 3. p. 208.

more diffuſed, their effects are ſlower, but ſtill evidently mark out a direct affection of the nervous ſyſtem.

Those who are expoſed to the vapours of the fermenting grape, are as inſtantly deſtroyed, as they would be by the ſtrongeſt electrical ſhock. A ſtate of inſenſibility is the immediate effect upon thoſe animals which are thruſt into the Grotti di Cani, or the cavern of Pyrmont; the animal is deprived of motion, lies as if dead, and if not quickly returned into the freſh air, is irrecoverable. And if we attend to the hiſtories of thoſe who have ſuffered from the vapours of burning charcoal, we ſhall in like manner find, that the brain and moving powers, are the parts primarily affected.

A cook who had been accuſtomed to make uſe of lighted charcoal more than his buſineſs required, and to ſtand with his head over theſe fires, complained for

for a year of very acute pain in the head; and after this, was seized with a paralytic affection of the lower limbs, and a slow fever. *(h)*

A PERSON was left reading in bed with a pan of charcoal in a corner of the room. On being visited early the next morning, he was found with his eyes shut, his book open and laid on one side, his candle extinguished, and to appearance like one in a deep sleep. Stimulants and cupping glasses gave no relief; but he was soon recovered by the free access of fresh air. *(i)*

FOUR prisoners, in order to make their escape, attempted to destroy the iron work of their windows, by the means of burning charcoal. As soon as they commenced their operations, the fumes of the charcoal being confined by the closeness of the prison, one of them was struck dead;

(h) Morgagni. Epist. 64. §. 15. *(i)* Chesneau, 696.

another was found pale, ſpeechleſs, and without motion; afterwards he ſpoke incoherently, was ſeized with a fever and died. The other two were with great difficulty recovered. *(k)*

Two boys went to warm themſelves in a ſtove heated with charcoal. In the morning they were found deſtitute of ſenſe and motion, with countenances as compoſed as in a placid ſleep. There were ſome remains of pulſe, but they died in a ſhort time. *(l)*

A FISHERMAN depoſited a large quantity of charcoal in a deep cellar. Some time afterwards, his ſon, a healthy ſtrong man, went down into the cellar with a pan of burning charcoal and a light in his hand. He had ſcarcely deſcended to the bottom, when his candle went out. He returned, lighted his candle, and again deſcended. Soon

(k) Donatus Epiſt. 694. *(l)* Ib. 695.

Soon after he called aloud for aſſiſtance. His mother, brother, and a ſervant haſted to give him relief, but none of them returned. Two others of the village ſhared the ſame fate. It was then determined to throw large quantities of water into the cellar; and after two or three days, they had acceſs to the dead bodies.*

Cælius Aurelianus ſays, that thoſe who are injured by the fumes of charcoal, become cataleptic. *(m)* And Hoffman himſelf, in another part of his works, enumerates a train of ſymptoms which in no reſpect correſpond with his idea of ſuffocation. Thoſe who ſuffer from the fumes of burning charcoal, ſays he, have ſevere pains in the head, great debility, faintneſs, ſtupor and lethargy. *(n)*

It appears from the above hiſtories and obſervations, that theſe vapours exert their

* Hiſtoire de l' Academié de ſcience, Ann. 1710.
(m) De morbis acutis, lib. ii. c. x.
(n) Tom. 1. p. 229. § 5.

their noxious effects on the brain and nerves. Sometimes they occaſion ſudden death; at other times, the various ſymptoms of a debilitated nervous ſyſtem, according as the poiſon is more or leſs concentrated. The olfactory nerves are firſt and principally affected, and the brain and nervous ſyſtem by ſympathy or conſent of parts. It is well known, that there is a ſtrong and ready conſent between the olfactory nerves and many other parts of the nervous ſyſtem. The effluvia of flowers and perfumes, in delicate or irritable habits, produce a train of ſymptoms, which though tranſient, are analogous to thoſe which are produced by the vapours of charcoal; viz. vertigo, ſickneſs, faintneſs, and ſometimes a total inſenſibility. The female malefactor, whom Doctor Mead inoculated by putting into the noſtrils doſſils of cotton impregnated with variolous matter, was immediately on the introduction, afflicted with a moſt excruciating head ach, and had a conſtant fever till after the eruption.

THE vapours of burning charcoal, and other poiſonous effluvia, frequently produce their prejudicial and even fatal effects, without being either offenſive to the ſmell, or oppreſſive to the lungs. It is a matter of importance therefore, that the common opinion ſhould be more agreeable to truth; for where ſuffocation is ſuppoſed to be the effect, there will be little apprehenſion of danger, ſo long as the breaſt keeps free from pain or oppreſſion.

IT may be well to remember, that the poiſon itſelf is diſtinct from that groſs matter which is offenſive to the ſmell; and that this is frequently in its moſt active ſtate, when undiſtinguiſhed by the ſenſe. Were the following cautions generally attended to, they might in ſome inſtances be the happy means of preſerving life. Never to be confined with burning charcoal in a ſmall room, or where there is not a free draught of air

by

by a chimney or ſome other way. Never to venture into any place in which air has been long pent up, or which from other circumſtances ought to be ſuſpected; unleſs ſuch ſuſpected place be either previouſly well ventilated, or put to the teſt of the lighted candle. For it is a ſingular and well known fact, that the life of flame, is in ſome circumſtances ſooner affected and more expeditiouſly extinguiſhed by noxious vapours, than animal life. A proof of which I remember to have received from a very intelligent Clergyman, who was preſent at a muſical entertainment in the theatre at Oxford. The theatre was crouded; and during the entertainment, the candles were obſerved to burn dim, and ſome of them went out. The audience complained only of faintneſs and languor; but had the animal effluvia been ſtill further accumulated or longer confined, they would have been extinguiſhed as well as the candles.

THE moſt obvious, effectual, and expeditious means of relief to thoſe who have unhappily ſuffered from this cauſe, are ſuch as will diſlodge and waſh away the poiſon, reſtore the energy of the brain and nerves, and renew the vital motions. Let the patient therefore be immediately carried into the open air, and let the air be fanned backwards and forwards to aſſiſt its action; let cold water be thrown on the face, and let the face, mouth and noſtrils be repeatedly waſhed; and as ſoon as practicable get the patient to drink ſome cold water. But if the caſe is too far gone to be thus relieved, let a healthy perſon breathe into the mouth of the patient; and gently force air into the mouth, throat and noſtrils. Frictions, cupping, bleeding, and bliſters are likewiſe indicated. And if after the inſtant danger is removed, a fever be excited, the method of cure muſt be adapted to the nature and prevailing ſymptoms of the fever.

ON THE

ATRABILIS.

THE ancients, as appears from Galen, ſuppoſed the *atrabilis* to be derived either from the dregs of the blood, or from yellow bile torrefied and highly concocted. A celebrated modern anatomiſt is of opinion that it is blood, which having lodged ſome time in the inteſtinal canal, has acquired a blackneſs and putridity. But is it not more probable that in general it is no other than gall, become acrid by ſtagnation in the *veſica fellea*, and rendered viſcid by the abſorption of its fluid parts? When diſcharged into the *duodenum* in this ſtate, it occaſions univerſal diſturb-

disturbance and disorder, till evacuated either by vomiting or purging. I have lately had under my care a young gentleman, labouring under a *marasmus*, produced by excessive intemperance. During the course of his disorder, which at last proved fatal, he several times voided both by stool and vomiting, a considerable quantity of black, tenacious, and most offensive bile. The symptoms preceding the discharge, and which ceased soon afterwards, were a quick pulse, head ach, delirium, hiccup, intense thirst, inward heat, and an uncommon fœtor in his breath. A lady aged thirty, unhappily addicted to habits which have a peculiarly pernicious effect upon the liver, after a constipation of the belly during six days, was seized with a violent and incessant vomiting of black and viscid bile. The *infusum senæ limoniatum*, warmed with the tincture of Columbo soon checked her reachings, and operating by stool prevented the return of her vomiting. The matter

ter discharged in both these cases bore not the least resemblance to grumous blood. I have several times observed the febrile symptoms in children, which are ascribed to dentition, relieved by these pitchy stools. And I recollect three cases of the *acute asthma*, as Dr. Millar terms it, the paroxysms of which seemed to be critically terminated by a similar evacuation. Whether in these instances the black bile was the cause or the effect of the disease, cannot with certainty be determined; but the former appears to be the more probable opinion.

ON THE SEPTIC QUALITY OF SEA SALT, &c. &c.

SIR JOHN PRINGLE obſerves that one drachm of ſea ſalt preſerves two drachms of freſh beef, in two ounces of water, above thirty hours uncorrupted, in a heat equal to that of the human body, that is twenty hours longer than water alone; but that half a drachm of ſalt does not preſerve it above two hours longer than pure water; that twenty-five grains have little or no antiſeptic virtue; and that ten

grains both heighten and haſten the corruption of the fleſh. *(a)* The reſult of this experiment is ſo curious and unexpected, that I wiſhed to aſcertain the cauſe of it.

EXPERIMENT I.

May 15th, 1772. EQUAL parts, viz. two drachms of the lean of mutton, chopped very ſmall, were ſeparately put into five wide mouthed phials, and to each were added two ounces of pump water. Ten grains of ſea ſalt were diſſolved in the firſt; the ſame quantity of brown bay ſalt in the ſecond; of *ſal cathartic*us *amarus* in the third; and of true glauber's ſalt in the fourth. The fifth contained only fleſh and water, and was intended for a ſtandard. The bottles were ſlightly corked, and after a gentle agitation placed in a window, expoſed to the weſtern ſun. The mercury in Farenheit's thermometer then ſtood in the ſhade at 65 degrees. IN

(a) Pringle's Diſeaſes of the Army, Appendix, p. 38.

In twenty-nine hours the mixture which contained the *ſal catharticus amarus* had acquired ſomewhat of a putrid taint.

In forty hours the ſtandard was ſlightly offenſive. The mixture with ſea ſalt was putrid, and that with the cathartic ſalt was yet more putrid.

In fifty hours the ſtandard and the two mixtures above-mentioned were equally putrid. The two others were ſweet.

In ſixty-two hours the ſtandard was become much more offenſively putrid than the two mixtures with ſea ſalt, and cathartic ſalt, in which the putrefactive proceſs appeared not to have advanced any further. The fleſh with the brown bay ſalt was now ſlightly tainted; but that with the true glauber's ſalt was ſtill ſweet.

In ſeventy-five hours the mixture with brown bay ſalt was become putrid, and

that with the true glauber's ſalt a little offenſive. And in twelve hours longer the latter mixture was alſo putrid.

FROM this experiment it appears that common ſalt, in the quantity of ten grains promotes putrefaction, and that the *ſal catharticus amarus* in the ſame proportion is yet more ſeptic; but that bay ſalt in this quantity reſiſts putrefaction, and that true glauber's ſalt exceeds in this reſpect even bay ſalt. The ſeptic and antiſeptic qualities of theſe ſalts, when uſed in ſo minute a quantity, are therefore evidently dependent on, and proportioned to their degrees of purity. Alimentary ſalt, it is well known, contains in its cryſtals an earthy ſalt, ſimilar to that of Epſom; which is a powerful ferment, almoſt equally capable in a ſmall as in a large quantity, of exciting the putrefactive proceſs in ſubſtances diſpoſed to it. Whereas the pure neutral itſelf, which conſiſts of the muriatic acid and the foſſil alkali, can only exert its antiſeptic powers when uſed in a proportion adequate

adequate to the action of the bitter salt with which it is combined, and superiour to the putrid tendency of the animal flesh, which it is employed to preserve. *(b)*

EXPERIMENT II.

May 21. Six days from the commencement of the experiment, the pieces of flesh in the solutions of common salt, and of *sal catharticus amarus*, were not more offensive than on the third day; and the mixtures emitted no air bubbles. But the standard at this time was intolerably putrid, very frothy, and the bits of mutton had risen to the surface of the water.

This experiment shews that both sea salt and the bitter purging salt, though they quicken putrefaction, prevent the progress of it beyond a certain degree. A quality which

(b) Sir John Pringle informs me, he has long suspected, but never ascertained the fact by experiment, that the septic quality of sea salt is owing to some heterogeneous substance joined to it.

which muſt increaſe the uſefulneſs of the former, as a ſeaſoning to our food.

A LATE eminent and learned writer has related the hiſtory of a violent ſcurvy, produced by drinking ſea water. A young lady, aged 16, tall, thin, and of a delicate conſtitution, though in tolerable good health, was adviſed to uſe ſea water on account of a ſtrumous ſwelling and inflammation of her upper lip. She drank a pint of it every morning for ten days ſucceſſively; which did not paſs off freely by the uſual evacuations. At the end of this period ſhe was ſuddenly ſeized with a profuſe diſcharge of the *catamenia*, was perpetually ſpitting blood from the gums, and had innumerable petechial ſpots on different parts of her body. Her pulſe was quick, though full; her face pale and ſomewhat bloated; and her fleſh ſoft and tender. She was often faint, but ſoon recovered her ſpirits. The flux from the *uterus* at length abated; but that from the gums increaſed to ſuch a degree, that

her

her Apothecary took a little blood from her arm. From the orifice blood continually ouzed for ſeveral days. At laſt an hœmorrhage from the noſe came on, attended with frequent faintings, in which ſhe at length expired, choaked as it were with her own blood. Before ſhe died, her right arm was mortified from the elbow to the wriſt. And it is further to be remarked, that though blood let from her ſome weeks before ſhe began the uſe of ſea water, was ſufficiently denſe; yet that drawn in her laſt ſickneſs was mere putrid, and diſſolved gore. *(a)*

Doctor Huxham explains the diſſolvent action of ſea water in this inſtance, by ſuppoſing an accumulation of the marine ſalt in the maſs of blood, which running into *moleculæ*, too large to paſs the minuteſt veſſels, occaſioned ſtagnations; and by irritating the capillaries, produced ruptures of them, extravaſations, blotches, and livid ſpots. But do not the preceding ex-

(a) Vid. Philoſ. Tranſact. Vol. 53, p. 6.

periments ſuggeſt a better ſolution of the fact? Sea water abounds with the cathartic ſalt, which conſtitutes the bittern of it; and this has been proved to be a powerful ſeptic.

A PHYSICIAN who often takes magneſia, to correct an acidity in his ſtomach, ariſing from indigeſtion, invariably obſerves that the diſcharges which it produces are peculiarly putrid and offenſive. Hence it is probable that this earth combined with an acid of the vegetable as well as of the mineral claſs, promotes putrefaction. Should we not therefore employ the *ſal catharticus amarus* and *magneſia alba* with caution, in diſeaſes of a putrid tendency?

I CANNOT omit this opportunity of recommending the calcination of magneſia, as a great improvement of that medicine. The loſs of its fixed air, which by this proceſs appears to conſtitute ſeven twelfths of

of its weight, obviates the flatulence which it produces in the *primæ viæ*, without diminiſhing its purgative or abſorbent qualities. Care however ſhould be taken that the magneſia be free from any calcareous earth, otherwiſe the action of the fire will render this mild powder offenſively cauſtic to the ſtomach, as I have more than once experienced. Magneſia may be calcined with very little trouble, in a common crucible placed in a glowing fire, and kept red hot during the ſpace of two hours. This improvement was ſuggeſted to me by a Phyſician in London, diſtinguiſhed for his knowledge of chemiſtry.

ON COFFEE.

THOUGH coffee has been in general uſe for more than a century paſt, has been analyſed by fire, and variouſly inveſtigated by writers of learning and reputation; yet neither chemiſtry nor experience have hitherto aſcertained its true nature, or medicinal qualities. Of this the contradictory teſtimonies which have been delivered concerning it, afford a painful evidence. For it is ſurely to be lamented that an article of diet, active in its powers, and univerſally employed, ſhould

ſhould be ſo little underſtood. The following experiments may perhaps lead to farther enquiries on this uſeful ſubject.

EXPERIMENT I.

THIRTY berries of roaſted, and the ſame number of unroaſted coffee were each digeſted, forty-eight hours, in two ounces of rectified ſpirit of wine. The former tincture was ſtrongly impregnated with the peculiar taſte and odour of the coffee; the latter had acquired little or no ſenſible flavour.

EXPERIMENT II.

TEN drops of a ſolution of green vitriol, were added to a tea ſpoonful of each of the above-mentioned tinctures, diluted with an ounce of water. Both aſſumed a purple colour; but the change was greateſt in the tincture prepared with unroaſted coffee.

A ſi-

A ſimilar difference was obſervable in the infuſions of roaſted and unroaſted coffee prepared with water, allowance being made for the dark hue communicated to the *menſtruum* by the roaſted coffee.

THESE facts evince the action of fire in diminiſhing aſtringency; and furniſh an additional proof of the impropriety of employing heat in preparations of the bark, and other vegetables of a like quality. *(a)*

EXPERIMENT III.

Two drachms of roaſted mutton chopped very ſmall, were digeſted in an ounce of pump water, and in the ſame quantity of a ſtrong infuſion of roaſted coffee. The phials which contained the mixtures, were placed at a moderate diſtance

(a) Vid. the Author's Eſſays Medical and Experimental, 2d. edit.

tance from the fire, ſo as to be kept nearly blood warm. In thirty hours the mutton and water became putrid; but the infuſion of coffee continued ſweet twelve hours longer.

EXPERIMENT IV.

To aſcertain the action of coffee on the digeſtion of food in the ſtomach, I prepared three alimentary mixtures, conſiſting of equal parts, viz. two drachms of roaſted mutton, of the crumb of bread, and of ſaliva, beat into a pulp, and ſeverally combined with an ounce of the infuſions of coffee, of green tea, and the ſame quantity of pump water. The bottles were placed (as in the former experiment) at a proper diſtance from the fire, and every now and then carefully examined. A fermentation was firſt perceived in the ſtandard, i. e. the mixture with pump water, which became ſour in about forty-

eight

eight hours. The infuſion of coffee emitted few air bubbles, and continued near four days without ſhewing any ſigns of acidity. By an accident, the phial which contained the tea was broken at the beginning of the experiment.

EXPERIMENT V.

March 29th, 1772. I awoke at five o'clock in the morning with the head-ach. My pulſe was hard and full, and beat 92 ſtrokes in a minute. I drank four diſhes of ſtrong coffee. In half an hour the pain in my head was relieved; yet my pulſe ſtill continued to vibrate the ſame number of times, but was ſofter and leſs full. In an hour it ſunk to 70. In an hour and a half it roſe again to 76; and in two hours to 80, which is the ſtandard of its frequency in health. I was in a recumbent poſture during the whole time of this experiment, which I have

have ſince repeated ſeveral times, under different circumſtances, with no material variation in the reſult.

FROM theſe obſervations we may infer that coffee is ſlightly aſtringent, and antiſeptic; that it moderates alimentary fermentation, and is powerfully ſedative. Its action on the nervous ſyſtem probably depends on the oil it contains; which receives its flavour, and is rendered mildly empyreumatic by the proceſs of roaſting. Neumann obtained by diſtillation from one pound of coffee, five ounces, five drachms and a half of water; ſix ounces and half a drachm of thick fœtid oil, and four ounces and two drachms of a *caput mortuum*. And it is well known that rye, torrefied with a few almonds, which furniſh the neceſſary proportion of oil, is now frequently employed as a ſubſtitute for theſe berries.

The MEDICINAL QUALITIES of coffee ſeem to be derived from the grateful ſenſation

ſation which it produces in the ſtomach; and from the ſedative powers it exerts on the *vis vitæ*. Hence it aſſiſts digeſtion, and relieves the head-ach; and is taken in large quantities, with peculiar propriety, by the Turks and Arabians, becauſe it counteracts the narcotic effects of opium, to the uſe of which thoſe nations are much addicted.

In delicate habits it often occaſions watchfulneſs, tremors, and many of thoſe complaints which are denominated nervous. It has even been ſuſpected of producing palſies, and from my own obſervation I ſhould apprehend, not entirely without foundation. Slare affirms that he became paralytic by the too liberal uſe of coffee; and that his diſorder was removed by abſtinence from that liquor.

Coffee berries are ſaid to be remarkably diſpoſed to imbibe exhalations from other bodies, and thereby to acquire an adven-

adventitious and disagreeable flavour. A bottle of rum placed at some distance from a canister of coffee, so impregnated the berries in a short time as to injure their flavour. Some years since a few bags of pepper were conveyed in a coffee-ship from India, the effluvia of which being absorbed by the coffee, the whole cargo was spoiled. *(a)*

(a) Miller's Gardener's Dictionary, 8th. Edition, Article, COFFEE.

A REVIEW OF THE MOST IMPORTANT CONCLUSIONS DEDUCED FROM THE PRECEDING EXPERIMENTS.

1. COLUMBO ROOT yields its virtues moſt perfectly to rectified ſpirit of wine; and to other *menſtrua* in the following order. 1. To French brandy. 2. to Madeira wine. 3. to white wine. 4. to diſtilled water. 5. to white wine vinegar. 6. to hard pump water.

2. THE watery infuſion of Columbo root is more periſhable than that of other bitters. In twenty-four hours a copious precipitation takes place in it; and in two days it becomes ropy, and even muſty.

3. THE

3. The addition of orange peel renders the infuſion of Columbo root leſs ungrateful to the palate.

4. Twelve ounces of Columbo root yield eight ounces and two drachms of extract, which retains the entire flavour of the root, and is equal, if not ſuperiour in efficacy to the powder.

5. Peruvian bark reſiſts the putrefaction of animal fleſh more powerfully than the Columbo root; but as a preſervative of the bile from putridity, this root exceeds the cortex.

6. Peruvian bark mixed with putrid gall, inſtantly produces a coagulation, and conſiderably increaſes the fœtor of it. Whereas the infuſion of Columbo root unites perfectly with it, and very powerfully corrects its offenſive ſmell. This ſerves in ſome meaſure to explain the ac-

tion of this remedy in the *cholera morbus*, and other diſeaſes attended with a redundance and depravation of the bile.

7. COLUMBO ROOT moderates, without ſuſpending the fermentation of alimentary mixtures; prevents them from growing ſour; and neutraliſes acidities when formed, much more completely than Peruvian bark, or chamomile flowers.

8. COLUMBO ROOT does not increaſe the quickneſs of the pulſe; and may therefore be uſed with propriety in the *pthiſis pulmonalis*, and in hectical caſes, to correct acrimony, and to ſtrengthen the organs of digeſtion.

9. THE Columbo root is a uſeful remedy in the *cholera morbus*; in diarrhœas; in the dyſentery; in bilious fevers; in a languid ſtate of the ſtomach, attended with want of appetite, nauſea, and indigeſtion; and in habitual vomitings, when they

they proceed from a weakneſs or irritability of the ſtomach, from an irregular gout, from acidities, or from acrimonious bile.

10. The ORCHIS ROOT might be cultivated to great advantage in England, and SALEP which is a preparation of it, might be afforded at eight-pence or ten-pence per pound. Whereas foreign ſalep is now ſold at five or ſix ſhillings per pound.

11. RICE, as an aliment, is inferior to ſalep; being ſlow of fermentation, and a very weak corrector of putrefaction. It is therefore an improper diet for hoſpital patients; and more particularly for ſailors, in long voyages; becauſe it ſeems incapable of preventing, and will not contribute much to check the progreſs of that fatal diſeaſe the ſea ſcurvy.

12. CHEESE, when mellowed by age, ferments readily with fleſh and water;

but ſeparates a rancid oil, which appears to be incapable of any further change, and muſt, as a ſeptic, be pernicious in the ſcurvy. The ſame objection may be urged, with ſtill greater propriety, againſt the uſe of cheeſe in hoſpitals; becauſe convaleſcents are ſo liable to relapſes, that the ſlighteſt error of diet may occaſion them.

13. SALEP has the ſingular property of concealing the taſte of ſalt water; a circumſtance of the higheſt importance at ſea, when there is a ſcarcity of freſh water.

14. SALEP retards the acetous fermentation of milk; and conſequently would be a good lithing for milk pottage, eſpecially in large towns, where the cattle being fed upon ſour draft, muſt yield aceſcent milk.

15. SALEP, in a certain proportion, would be a uſeful and profitable addition

to

to bread. For by abſorbing and retaining more water than flour alone is capable of, it occaſions a conſiderable increaſe of weight.

16. BUXTON WATER is found, by analyſis, to contain calcareous earth, foſſil alkali, and ſea ſalt; but in very ſmall proportions. For a gallon of the water, when evaporated, yields only twenty-four grains of ſediment.

17. THE temperature of Buxton bath is 82 degrees of Farenheit's thermometer; that of St. Ann's well ſomewhat leſs.

18. BUXTON water, when drunk, quickens the pulſe very conſiderably, and ſometimes occaſions the head-ach. By the fixed air which it contains, it readily diſſolves iron; and ſuch an impregnation muſt, in many caſes, improve its medicinal virtues.

19. MATLOCK WATER is grateful to the palate, and of an agreeable warmth, but exhibits no marks of any mineral ſpirit. It is very ſlightly impregnated with *ſelenites*, and contains a ſmall portion of ſea ſalt. Some have ſuppoſed that it is a chalybeate, but without foundation.

20. THE Briſtol and Matlock waters appear to reſemble each other, both in their chemical and medicinal qualities.

21. MATLOCK bath raiſes Farenheit's thermometer to the 68th; the ſpring to the 66th. degree.

22. FIXED air may, in no inconſiderable quantity, be breathed without danger or uneaſineſs. And in ſeveral caſes of the *pthiſis pulmonalis*, the ſteams of an effervеſcing mixture of chalk and vinegar, have been inſpired with great advantage. Antiſeptic fumigations and vapours have been long employed and much extolled

extolled in ſuch diſorders. But their efficacy does not appear to depend on the extrication of fixed air from their ſubſtance.

23. THERE appears to be a diverſity in the properties and effects of different ſpecies of factitious air.

24. THE fixed air of metals ſeems to be of a kind different from that which is contained in alcalis and calcareous earth. And conſequently the action of theſe ſubſtances as *fluxes*, cannot be explained on the principle of their reſtoring the air, which had been loſt by calcination.

25. COMMON SALT, in the quantity of ten grains, promotes putrefaction; the *ſal catharticus amarus* in the ſame proportion is yet more ſeptic; but BAY SALT in this quantity reſiſts putrefaction; and GLAUBER'S SALT exceeds in this reſpect even bay ſalt. The ſeptic and antiſeptic qualities of theſe ſalts, when uſed in ſo minute

minute a quantity, are therefore evidently dependent on, and proportioned to their degrees of purity.

26. SEA SALT, and the bitter purging ſalt, though they quicken putrefaction, prevent the progreſs of it beyond a certain degree. A quality which muſt increaſe the uſefulneſs of the former, as a ſeaſoning to our food.

27. COFFÆE is ſlightly aſtringent, and antiſeptic; moderates alimentary fermentation, and is powerfully ſedative. Its action on the nervous ſyſtem probably depends on the oil it contains; which receives its flavour, and is rendered mildly empyreumatic by the proceſs of roaſting.

SELECT

SELECT

HISTORIES OF DISEASES,

WITH

REMARKS.

Longum iter per precepta; breve et efficax per exempla.

SENECA.

*THE HISTORY AND CURE OF A DIFFICULTY IN DEGLUTITION OF LONG CONTINUANCE, ARISING FROM A SPASMODIC AFFECTION OF THE OESOPHAGUS.

MISS L—r, aged thirteen, a ſprightly girl, of a delicate and irritable habit of body, during ſeveral years had a difficulty of ſwallowing; which occaſionally left her for a month or two, and then ſuddenly returned without any apparent cauſe. September 3d, 1768, I was deſired to viſit her. She had then laboured under her diſorder ſix or eight months without any intermiſſion, and was reduced

*This Caſe was read before the College of Phyſicians, Auguſt 9, 1769, and is publiſhed in the Medical Tranſactions, Vol. 2.

duced almoſt to a ſkeleton, though ſhe ſtill retained her natural vivacity. When ſhe attempted to ſwallow ſolids, they paſſed down readily as far as the upper orifice of the ſtomach; but when arrived there, they were inſtantly, and with a ſtrong convulſive motion, thrown up again. Liquids ſipped ſlowly, and ſwallowed leiſurely, met with no reſiſtance; but when haſtily drunk, or in too large a quantity, they were quickly regurgitated. Warm liquors were ſwallowed with more eaſe than cold ones; and in the evening, the difficulty in deglutition generally abated. She complained of no other pain but an uneaſy craving in her ſtomach; nor was there any external ſwelling, or inward ſoreneſs, through the whole paſſage of the *æſophagus*. When ſhe was in her ninth year the *catamenia* appeared, and had recurred once or twice ſince that time, without any regularity. Her belly was coſtive, her pulſe was quick and ſmall, and her feet were uſu-

ally

ally cold. She was neither of a ſtrumous nor ſcorbutic habit of body; nor could her friends give me any ſatisfactory account of the origin or cauſe of her diſorder.

I APPREHENDED her caſe to be ſpaſmodic, complicated with a ſlight thickening of the *æſophagus* about the part affected, the conſequence of a contraction ſo long continued. The following medicines were therefore preſcribed.

℞. *Elixir. myrrhæ comp. tinct. valerian. vol. aa.* ℥*iv. M. dentur guttæ viginti in thea pulegii bis die.*

℞. *Ol. amygdal.* ℥*j. ſp. ſal. ammon. cum calce viva* ℥*vj. camphoræ oleo ſolutæ* ℥*ij. ol. ſuccin.* ℥*iſs. M. f. linimentum, quo bene fricetur ſpina dorſi, a prima cervicis vertebra uſque ad duodeciman dorſalem, mane & veſperi quotidie.*

℞. *Merc.*

℞. *Merc. dulcis ſexies ſublimat. gr. ſs. mucilag. gum. Arab. ℈ij. ſp. nitri dulcis ℈ij. vin. antimon. gutt. vj. Aq. fontan. ℥ſs. Sacchari alb. ℈j. M. f. hauſt. hora decubitus quotidie ſumendus, vini antimonialis doſin ſenſim augendo.*

℞. *Extract. cort. Peruvian. mollis. caſtor. ruſſic. galban. colat. aa. partes æquales, camphoræ ſp. vin. rect. trit. ℥j. ol. ſuccini. ℈j. balſam. Peruvian. q. ſ. M. f. emplaſtrum ſcrobiculo cordis applicandum, & ſemel in ſeptimana renovandum.*

DIRECTIONS were given that her feet and legs ſhould be kept warm; that her drinks ſhould not be taken cold; that her diet ſhould conſiſt of broth, mutton, or beef tea, as it is called, panada, vermicelli, ſago, rice, milk, chocolate, cocoa, ſalep, &c. that a little wine ſhould be occaſionally allowed;

ed; that ſhe ſhould abſtain from tea and coffee; that moderate exerciſe ſhould be daily uſed; and that a nouriſhing clyſter, prepared of milk, broth, &c. ſhould be injected every morning and noon; to obviate the looſening effect of which, a few red roſe leaves were ordered to be boiled in it, or a little ſtarch to be added to it.

September 22. The liniment, calomel draught, and clyſter, had been neglected. But the plaſter had been applied; ſhe had taken the drops with regularity, and had carefully obſerved the regimen preſcribed to her. The difficulty in deglutition was ſenſibly abated, her appetite was mended, and ſhe had recovered fleſh and ſtrength.

October 1. The mercurial draught had purged her. To prevent this effect, fifteen or twenty drops of *elixir paregoricum* were added. But a few days afterwards it occaſioned a ſoreneſs in her

gums, and a ſlight ſalivation. The uſe of it was therefore diſcontinued.

October 21. She could now ſwallow ſolid food without any difficulty. Her appetite was good, her belly regular, her pulſe fuller and ſlower, her fleſh and ſtrength recruited, and her health in every other reſpect was perfectly re-eſtabliſhed. I directed her to continue the uſe of her medicines, and to perſevere in her regimen a month or two longer; and ſhe has ever ſince been entirely free from her diſorder.

I shall beg leave to make ſome general obſervations on obſtructed deglutition, without confining myſelf to the particular conſideration of the caſe which has been related.

1. A difficulty in ſwallowing may proceed from ſuch a variety of cauſes, not eaſy to be diſtinguiſhed, and yet each requiring

requiring a particular method of cure, that the phyſician's practice in ſuch caſes muſt be uncertain and perplexed. And what adds conſiderably to this embaraſſment is, that the effect often co-operates with the original cauſe, and confirms the diſeaſe. Thus a conſtriction of the *œſophagus*, ariſing from a ſpaſmodic affection, will, if it continue long, produce either an enlargement of the glands, or a thickening of the ſubſtance of the gullet, about the part affected. On the contrary, if the ſtricture proceed from a glandular tumour, from ſchirroſities, or fungous excreſcences, it will at the ſame time be complicated with ſome degree of ſpaſm; of which amongſt ſeveral inſtances that have fallen under my obſervation, I ſhall mention the following. A farmer's wife, aged fifty, of a ſtrumous habit, perceived an impediment in her throat to the paſſage of ſolid food, ſome months before ſhe applied for advice. Her diſorder had increaſed by degrees, and ſhe was then

unable to ſwallow any thing but liquids. A ſurgeon examined the gullet with a probe, and found the two glands which are ſituated about the fifth vertebra of the back conſiderably enlarged. Æther was then a faſhionable remedy in this part of the country; and ſhe was induced, by the fame of its effects, to wiſh a trial might be made of it. A doſe properly diluted was given her, and about half an hour afterwards ſhe had the power of ſwallowing, without much difficulty, a morſel of ſolid food. But the relief was only temporary. She relapſed in an hour or two, and had again recourſe to the ſame remedy, which after a few trials loſt all its efficacy, and the poor woman having languiſhed about ſix months, died literally famiſhed. From this and other inſtances, I ſhould apprehend that the uſe of antiſpaſmodics would aſſiſt the operation of the mercurial courſe, ſo judiciouſly recommended by Doctor Munckley in the firſt volume of the Medical Tranſactions;

actions; and would quicken, as well as render more certain, the cure of this deplorable diſeaſe.

2. In ſpaſmodic affections of the *æſophagus*, external applications to the ſpine are likely to be very ſerviceable, from the contiguity of that tube to the *vertebræ*. And perhaps nothing would be more effectual in ſuch caſes than a bliſter, applied either to the neck or between the ſhoulders. That epiſpaſtics are powerful antiſpaſmodics, experience hath fully aſcertained; and where the diſorder is attended with an enlargement of the ſubſtance, or a fullneſs of the glands of the gullet, they would have additional efficacy, by producing a copious diſcharge of ſerous humours, and by that means unloading the veſſels of the part affected.

Volatile and antiſpaſmodic liniments are alſo highly uſeful, as the caſe above recited ſufficiently evinces. It is indeed

to be lamented that external applications of this kind are not more frequently employed in practice; for there is juſt reaſon to apprehend that powerful effects might be expected from them in various diſeaſes. In the hooping cough particularly, I have obſerved conſiderable benefit to accrue from the uſe of a liniment, ſimilar to the one preſcribed above.

3. When conſtrictions of the *æſophagus*, ariſing from ſpaſm, have been of long continuance, and do not yield to medicine; electricity furniſhes us with no improbable means of relief. The publick indeed have been much diſappointed in the medical effects of electricity. But this hath in part proceeded from the miſapplication of ſo powerful a remedy. It appears to me, and I am confirmed in this opinion by the obſervation of a very eminent phyſician, that the electric ſhock bids fair to do much more good

in diſeaſes from rigidity, than in thoſe from laxity. Amongſt many other proofs of this, may be adduced the cure of a univerſal *tetanus*, the hiſtory of which is publiſhed by Doctor Watſon, in one of the late volumes of the Philoſophical Tranſactions.

4. STIMULATING vapours conveyed into the *pharynx* have a tendency to remove ſpaſms, even when ſeated deep in the *œſophagus*. A few years ago an elderly gentlewoman, after eating peaſe, felt an uneaſy ſenſation as if one of them ſtuck low down in her throat, and ſuddenly found herſelf deprived of the power of deglutition. Notwithſtanding the uſe of a variety of remedies, her inability to ſwallow continued five or ſix days. She was directed to fumigate her throat with *aſſafœtida*, diſſolved in a ſtrong infuſion of the aromatic herbs: and drawing in the vapours very forcibly, the ſpaſm was in-

ſtantly reſolved; nor has ſhe ever ſince ſuffered the leaſt return of it.

5. When this dreadful diſeaſe is ſo confirmed as to be deemed incurable, the patient's life may be prolonged by the daily injection of nutritive clyſters, and by bathing his feet, hands, and arms, and occaſionally his whole body, in new milk, broth, decoctions of ſalep, ſago, or vermicelli, &c. The abſorption by the lymphatics of the ſkin is very conſiderable. It has been found by experiment that the hand, after being well chafed, will imbibe in a quarter of an hour near an ounce and a half of warm water. And allowing that the ſurface of the hand is to that of the body as one to ſixty, the abſorption of the whole, in the ſame ſpace of time, would amount to upwards of ſeven pounds. The copious diſcharge of urine in the *diabetes*, ſo much exceeding in quantity the patient's drink, confirms

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in ſome meaſure this calculation. And the curious fact related by Dr. Chalmers, at the ſame time that it affords a further proof of the great abſorption by the pores of the ſkin, points out to us the valuable purpoſes to which it may be applied in the diſorder under conſideration. A negro man, who had eaten or drunk but little before he was gibbetted in March, 1759, at Charles Town in South Carolina, and had nothing given him afterwards, regularly voided every morning a large quantity of urine, but diſcharged no more till about the ſame hour the next day. The dews of the evening, imbibed by the body, ſupplied in this caſe a ſuperabundance of fluids in the night, and a ſufficient quantity to ſupport perſpiration in the day. Had theſe fluids been of a nutritious quality, it is not improbable that, even under ſuch circumſtances, the poor negro might have been kept alive for a conſiderable length of time.

PROSPER ALPINUS relates that the Egyptian women, in order to become fat, uſe every day a tepid bath; and whilſt they continue in it, receive nouriſhing clyſters, and a variety of the richeſt foods. By this means the females of that country, particularly the Hebrew women who reſide there, are for the moſt part immoderately corpulent. *Illarum plurimæ perinde ac ſues cernuntur pinguiſſimæ humi recumbentes, maximeque Hebreæ, quibus iſtud vitii aliis familiarius obſervatur.*

I HAVE not enlarged upon the neceſſity of conveying aliment into the body by clyſters, in obſtructions of the *æſophagus*, becauſe this muſt be obvious to every practitioner. The other method of nutrition, if not leſs known, is certainly leſs attended to, and in general is altogether neglected. It may perhaps be thought an omiſſion, that no notice has been taken of the adminiſtration of medi-

cines

cines under the form of clyſters, in theſe deplorable caſes. But I apprehend, however uſeful they might be in many reſpects, they would in general too much interfere with the nouriſhment of the patient.

CASES

CASES OF DROPSIES.

CASE I.

MRS. POPPLETON, aged 33, a woman of a very delicate conſtitution, and ſubject to a *profluvium menſium*, which had greatly impaired her ſtrength, perceived about two years ago an indolent, moveable tumour in the lower part and left ſide of her belly, which gradually though ſlowly increaſed. Before it acquired any conſiderable bulk, her right leg began to ſwell, her urine was voided in

in ſmall quantity; the ſymptoms of thirſt and inward heat enſued; the *abdomen* became enlarged; a fluctuation was ſoon perceptible; and a complete *aſcites* was formed.

THE tumour in the lower part of her belly, which from its ſituation I apprehend was an incyſted dropſy of the left *ovarium*, now began to be extremely painful, the ſwelling of the *abdomen* increaſed, a general *anaſarca* was coming on, and her caſe became every day more and more deplorable. Things were in this ſtate, when the patient, as ſhe aroſe out of bed in the morning (February 2d, 1771,) was ſeized with a nauſea, without any apparent cauſe, which was ſoon ſucceeded by a violent vomiting. At three o'clock in the afternoon I was firſt called to her aſſiſtance, and found her quite exhauſted with inceſſant reachings. Her pulſe was ſo feeble as to be ſcarcely perceptible,

her extremities were cold, and her legs and thighs were affected with a moſt painful ſpaſm. She had diſcharged near ten pints of water, and this evacuation had entirely removed the anaſarcous ſwellings, and greatly diminiſhed the fullneſs and tenſion of the belly. The tumour of the left *ovarium*, though much decreaſed in bulk, was evident to the touch, and appeared to be ſtill moveable under the fingers. Gentle cordials were directed to ſupport the patient's ſtrength, warm fomentations were applied to her legs and thighs, and an opiate was adminiſtered, to procure for her a ſhort interval of reſt and eaſe. She enjoyed a few hours refreſhing ſleep; the vomiting then recurred, and continued five or ſix days, with intermiſſions, which gradually became longer and longer. Her thirſt during theſe evacuations was almoſt inſupportable, but ſhe refrained with great reſolution from all liquids, except a little red port wine diluted with mint water. O-

ranges

too were freely allowed, and were highly grateful to her. All her dropſical ſwellings were now removed, and the tumour of the *ovarium* itſelf was no longer perceptible. When the vomiting ceaſed, a gentle *diarrhœa* ſucceeded. An infuſion of the bark with the *ſp. nitr. dulcis.* and *tinct. mart. in ſp. ſalis* were given. Her thirſt abated, her appetite returned, and in a few weeks ſhe recovered a tolerable degree of health and ſtrength, and ſtill continues free from any of her former ailments, though it is now four months from the time when her vomitings commenced. The quantity of water ſhe diſcharged, excluſive of her evacuations by ſtool and urine, amounted to about three gallons.

The caſe before us affords a ſtriking proof of the efforts which nature exerts to relieve herſelf. By what ſecret inſtruments this ſalutary change was produced in the preſent inſtance, we may conjecture,

ture, but cannot aſcertain. It is not to be ſuppoſed that the extravaſated fluids paſſed by percolation through the coats of the ſtomach or inteſtines, and were then diſcharged by vomiting; becauſe theſe coats in the living body are impervious to water, and tranſmit it only when the circulation ceaſes, when their veſſels ſhrink, and the *mucus* lining the internal cavity is dried or abraded. Nor is it eaſy to conceive, how the hydropic cyſt of the *ovarium* ſhould thus empty itſelf into the ventricle; or ſo large a quantity of water tranſude with ſuch rapidity, through the interſtices of its fibres. For that the ſtomach was not ruptured is evident from the ſpeedy recovery of the patient. The effect therefore muſt be aſcribed, not to a mechanical cauſe, but to that vital energy which by imperceptible means regulates the motions, and corrects the diſorders of the animal frame; though ſometimes with a degree of violence dangerous to, and even deſtructive of life. In the preſent

preſent caſe it appears probable, that a ſudden change took place in the courſe of circulation; the lymphatics recovered their power of abſorption, and performed their office with renewed vigour; the vaſcular ſyſtem became overloaded, and the exhalant arteries of the ſtomach and inteſtines poured forth the ſuperfluous fluids, reſtoring thus the equilibrium.

INSTANCES of a ſudden, and partially increaſed action of the veſſels frequently occur, as in the *diarrhœa*, *cholera morbus*, hyſteric diſeaſe, *profluvium urinæ*, &c. &c. But the following hiſtory, related by Doctor Simſon, admirably illuſtrates, and at the ſame time confirms what I have advanced. *Cum homo adoleſcens, febri correptus, cui aceſſerat diarrhœa, cum extremo ſtupore ſenſuum, nihil plane ore haurire vellet, (quamquam immoderato æſtu totus torreſceret) quo humectaretur, jubeo in aquam egelidam imergi pedes; quo facto, protinus aquæ mirum cerno in vaſe decrementum,*

deinde ejuſdem vixdum coloratæ, e veſtigio impetuoſam, more cataractæ, per anum effuſionem. (a)

SEVERAL inſtances are recorded of anaſarcas, and ſome few even of the aſcites, which have been cured by vomiting. But I believe it has rarely if ever happened, at leaſt I do not recollect ſuch a caſe either in books or in practice, that a dropſy of the *ovarium* has been removed by the ſpontaneous efforts of nature. Deductions from ſingular and ſolitary facts, though contrary to the rules of philoſophiſing, are not always to be rejected; but may be allowed with proper caution and reſerve, when the nature of the ſubject admits not of better evidence. The hiſtory before us furniſhes, I apprehend, an exception to the general laws of reaſoning by induction; and one inſtance, well authenticated, of the cure of

(a) Simſon de Re Medica, p. 183.

of a diſeaſe, which the moſt eminent phyſicians have conſidered as irremediable, may juſtly lead us, in ſimilar circumſtances, to imitate by art the operations of nature; and to excite thoſe efforts, which when ſpontaneous, have proved ſo ſalutary. In the incipient ſtate of a dropſy of the *ovarium*, emetics repeatedly adminiſtered would be likely means of promoting the abſorption or diſcharge of the incyſted fluid. They produce the ſtrongeſt contractions in the abdominal muſcles, agitate all the viſcera of the lower belly, quicken the circulation of the blood, and by their general action on the whole ſyſtem, remove obſtructions in the minuteſt and moſt remote ſeries of veſſels. Hence the powerful effects of Turpeth vomits in white ſwellings of the joints; in which the glands are at leaſt equally diſeaſed, and the extravaſated fluid as much out of the courſe of the circulation, as in the ſpecies of dropſy we are now conſidering. But unfortunately this diſorder is ſo inſi-

dious in its attack, and so little alarming in its progress, that it becomes almost incurable before the patient is apprehensive of any degree of danger. However in its more advanced stages, emetics may be administered with safety, and sometimes perhaps with advantage. If the *morsus diaboli* adhere to the enlarged *ovarium*, and the fallopian tubes be not totally obstructed, the action of vomiting may force a passage for the fluid, and thus procure at least some temporary relief. I have now under my care a lady who has long been afflicted with a dropsy of this kind, and who has frequent discharges of bloody water from the womb, succeeded always by a diminution of bulk. A troublesome *hernia* forbids the exhibition of an emetic, which otherwise I should not hesitate to direct. Besides we may possibly be so fortunate as to co-operate with nature at the most favourable conjuncture, and by assisting her efforts, of themselves perhaps

too

too languid, may effect a cure. Such inſtances do not unfrequently occur, in almoſt every ſpecies of diſeaſe; and it is upon this principle alone, that we can explain the amazing ſucceſs which has attended the exhibition of remedies, by no means adequate to the effects produced by them. Mr. W. a hard drinker, when paſt the meridian of life, had a jaundice which was ſucceeded by an *aſcites*, a dropſy of the *thorax*, and an *anaſarca*. The prognoſtic was in this caſe extremely unfavourable, and I ſcarcely indulged the leaſt hope of his recovery. Diuretics, purgatives, &c. under various forms, were aſſiduouſly adminiſtered, but with no very advantageous effects. Amongſt other medicines he took pills compoſed of *extract. jalap. pulv. ſcillar. ſiccat.* and *merc. dulcis.* and was directed to increaſe the doſe of theſe *pro re nata*. Finding the uſual quantity inſufficient to procure the neceſſary diſcharges, he took, if I re-

collect aright, two pills extraordinary, the consequence of which was an *hypercatharsis*, which greatly reduced his strength, but carried off all his dropsical swellings, and by the aid of cordials and corroborants, produced a perfect cure. The following curious case, communicated to me by a physician of eminence in a neighbouring town, further illustrates the observation advanced above; and at the same time shews the resources which medicine affords to a sagacious practitioner, in the most desperate stages of this disorder.

CASE II.

Miss H. of Namptwich in Cheshire, aged upwards of forty, had laboured for some time under an *ascites*, when she was removed to Liverpool in February 1769, for the benefit of medical advice. Two physicians and a surgeon were consulted, and

and after a gentle evacuation by ſtool, and the exhibition of a few cardiacs, it was agreed that ſhe ſhould be tapped without delay. Eighteen pints of water were drawn off, and two large ſchirrous tumours, one nearly the ſize of an infant's head, the other not much leſs in bulk, were diſcovered. Theſe ſhe had perceived for many years, and they had ſucceeded a fever, imperfect in its criſis. The operation had almoſt proved fatal to her; her mouth was covered with *aphthæ*, and ſo many alarming ſymptoms came on, that death was hourly expected. However in a fortnight ſhe was tolerably recovered, and in a month the *paracenteſis* was again repeated. She bore it better, but ſoon filled again, and was obliged to ſubmit to the operation every third week. Tired with the frequency of this painful palliative, after the fifteenth repetition of it, ſhe requeſted one of her phyſicians in a moſt preſſing manner, to preſcribe ſome medicine, which might at leaſt protract

the period of tapping. It was now the latter end of Auguſt, the weather was favourable, and he directed her to be confined to her bed for three days, to be aſſiduouſly rubbed morning and evening with dry cloths impregnated with the fumes of camphor, and to take internally the *julepum e camphora*, prepared with only two-thirds of a pint of water, and warmed with the addition of one ounce of *aqua juniperi compoſita*. Under this form ſhe took a drachm of camphor daily, for the ſpace of a fortnight. A continued gentle *diaphoreſis* was the happy conſequence; every day ſhe decreaſed in bulk, and the abatement of her ſwellings encouraged her reſolutely to perſevère in the uſe of her medicine. She recovered her health, and remained near two years free from any dropſical complaints. But in the ſummer of 1771, her diſorder recurred; and on the 16th. of July ſhe was again tapped. On the 8th. of October following, ſhe voided by the *anus* near twelve

pints

pints of a mucilaginous liquor, in colour reſembling *pus*, but without any offenſive ſmell. After this remarkable diſcharge, ſhe was better for a ſhort time; but a violent and very painful aphthous complaint, attended with a profuſe ſpitting of viſcid phlegm and ſaliva, then enſued; by which her ſtrength was exhauſted, and ſhe died on the 9th. of November, quite emaciated.

On the ſame day her body was opened in the preſence of two phyſicians, and other gentlemen of the faculty; and I am favoured by Mr. Wickſted, a very ingenious ſurgeon at Namptwich, who attended the patient during her laſt illneſs, with the following account of the appearances on diſſection.

"On opening the abdomen a large hard tumour preſented itſelf, which on examination, ſeemed to be the right

ova-

ovarium very much enlarged, and ſchirrous. It was in figure like an impregnated *uterus*, filling the lower ſpace of the abdomen, and riſing ſeveral inches above the brim of the *pelvis*. This ſubſtance, was found attached to the *uterus*, and weighed three pounds and ſeven ounces. By its preſſure the *uterus* and bladder were forced down into the lower part of the *pelvis*; and when divided, it reſembled a piece of boiled udder in colour and firmneſs.

The left *ovarium* was very hard, and enlarged to the ſize of a gooſe egg. The body of the *uterus*, which with the bladder had been preſſed by the weight of the tumour out of its uſual ſituation, was hardly to be diſtinguiſhed from the left *ovarium*, which was nearly of the ſame ſize and firmly united with it, and ſeemed to be a little diſeaſed. The fallopian tubes were almoſt obliterated. The bladder and ureters were ſound.

The

The hydropic cyſt, (which extended to the margin of the ribs, and appeared to be formed either from the diſtended peritonæal coats of the *ovaria*, or the duplicatures of the *peritonæum)* contained three quarters of a pint of a fluid, ſimilar to that which had been evacuated by ſtool.

The ſtomach and inteſtines were in a ſound ſtate, and no where adhered to the above-mentioned cyſt. But at the bottom of the *pelvis* the cyſt had a *firm attachment to the rectum* of the compaſs of half a crown; yet there was no viſible perforation, by which ſo large a quantity of fluids could eſcape. The omentum was waſted to a membranous expanſion. The kidnies, ſpleen, pancreas, and meſenteric glands were ſound. The ſubſtance of the liver was not at all diſeaſed, but its whole convex ſurface was fixed by ſtrong adheſions to the *diaphragm*. Both lobes of the lungs were found adhering to the *pleura*; their internal ſtructure however

ſeemed

ſeemed to be perfect. The heart was in a good ſtate; and the *pericardium* contained about two ounces of limpid water."

CASE III.

Mr. G. H. of Oldham, near Manchester, aged upwards of fifty, low of ſtature, corpulent, and habitually addicted to intemperance, in April, 1770, was afflicted with a dry cough, *dyſpnæa*, *aſcites*, and ſwelled legs. By the uſe of pills compoſed of *ſapo venet.* *gum. ammoniac.* and *pulv. ſcillar.* and a ſmart mercurial cathartic, which I directed to be repeated at ſuch intervals as not to debilitate his ſtrength, he recovered his former ſtate of health. But on the 2d. of January, 1771, I was again called to his aſſiſtance; he had been ſuddenly ſeized a few days before with a difficulty of breathing, which increaſed faſt, and was then attended with a cough and frothy expectoration; his pulſe

pulſe was languid and oppreſſed, his heat natural, his face bloated, and his legs were ſlightly œdematous; the *abdomen* was not fuller than uſual, nor had he previous to his attack, any ſymptoms of water in the cavity of the cheſt. A briſk purgative, *radix Senekæ*, *oxymel ſcillit.* bliſters to the legs, *camphor*, *ſal. volatile*, *venæſection*, &c. &c. were tried, but without effect. Reſpiration became more and more laborious, and in two days the patient was freed from his ſufferings by death.

It appears probable to me that an *anaſarca*, or infarction of the cellular membrane of the lungs, was the proximate cauſe of the *orthopnæa*, which in ſo ſhort a time proved fatal to the unhappy patient. This diſorder may, like other dropſies, ariſe from a general laxity of the ſolids, tenuity of the fluids, or obſtructed circulation of the blood; but in ſuch inſtances it will in all probability be ſlowly

and

and gradually produced. How then are we to account for its ſudden and rapid formation in the caſe I have juſt related? The ancient phyſicians who had no opportunities of diſſecting human bodies, obſerved in brutes, particularly in oxen, ſheep, and ſwine, large hydatids in the lungs; and to the rupture of theſe, Hippocrates and Galen, reaſoning from analogy, aſcribed the *hydrops pectoris* in the human ſpecies. Willis and Morgagni have adopted their opinion, and confirmed the teſtimony of the father of phyſic, and his learned commentators. Morgagni ſays, *In ſue autem, cæteroquin ſano, ut cætera ejuſmodi hic omittam, a me in beſtiis, hominibuſque conſpecta, hydatidem vidiſſe memini, quæ minorem ſui partem in pulmonis ſuperficie oſtendens, interius adeo ſe amplificabat, ut aquæ limpidæ uncias aliquot contineret. (a)* And another laborious anatomiſt

(a) Morgagni de cauſis & ſedibus Morb. Epiſt. 16. Art. 36.

tomiſt (*Bonetus in Sepulch. Anatom. Obſ.* 33 and 36,) informs us that the lungs of a man were found full of bladders, which when opened, diſcharged either water, or a clear liquor reſembling the white of an egg. Theſe obſervations I think point out the cauſe, and at the ſame time account for the rapid progreſs and fatal termination of the pulmonary *œdema*, under which my patient laboured. Some hydatids, contained in the cellular membrane of the lungs, were probably ruptured internally, and in an habit abounding with the *colluvies ſeroſa*, the extravaſated fluids would be every inſtant accumulating, and the bronchial veſicles, becoming more and more compreſſed, ſuffocation inevitably enſued.

The diagnoſtics of the *hydrops pectoris*, whether the water be contained in the cellular membrane of the lungs, or in the cavity of the cheſt, are ſometimes very obſcure. Doctor Hoadly relates that he was

was preſent at the diſſection of a dropſical man, from the ſymptoms of whoſe diſeaſe it was with ſuch certainty concluded, that water was contained in one ſide of the breaſt, that the only motive for examination was to determine into which cavity the fluid was extravaſated. On opening his body however they diſcovered not a ſingle drop of water, but found an almoſt total adheſion of the external coat of the lungs to the pleura; together with an inflammation, and numberleſs ſmall ulcers in one lobe.

A SENSIBLE fluctuation of water in the breaſt is a ſymptom which rarely occurs, and it appears from Morgagni's obſervations, that it is not unuſual for patients labouring under this diſorder, to bear with eaſe a recumbent poſture. But an *œdema* or dropſy of the cellular membrane of the lungs, when its attack is ſudden, may often be diſtinguiſhed by the following ſigns, although it muſt be acknowledged

knowledged that they ſometimes prove equivocal. The difficulty in reſpiration is conſtant, and increaſed by the leaſt motion, though not much varied by different attitudes of the body; the patient complains of great anxiety about the *præcordia*, and when he attempts to take a deep inſpiration, he finds it impoſſible to dilate his cheſt, and his breath ſeems to be ſuddenly ſtopped. The pulſe is ſmall, languid, and oppreſſed; the face pale and bloated; the legs uſually ſwelled, and the whole habit is for the moſt part leucophlegmatic.

A DISEASE ſo urgent in its ſymptoms, ſo quick in its progreſs, and ſo often fatal in its termination, requires a method of cure of adequate expedition and efficacy. A briſk mercurial cathartic, which will not only unload the internal canal, but promote abſorption, by ſtimulating and increaſing the action of the whole vaſcular ſyſtem, ſhould be adminiſtered

without delay. I have lately ſeen ſurpriſing relief in a very alarming caſe, almoſt inſtantly procured by ſuch a remedy. *(a)* Bliſters to the legs have alſo ſometimes a good effect; for by deſtroying the cuticle, and *rete mucoſum*, they diſcharge the water from the cellular membrane of a depending part, and thus in ſome degree produce a general depletion. Punctures made with a ſmall lancet, or with ſuch an inſtrument as Doctor Fothergill has lately recommended, will anſwer the ſame end; and be leſs liable to produce pain and inflammation. Diuretics, ſudorifics, and expectorants, as they all increaſe the more fluid excretions, are indicated in this diſeaſe. And if the moſt powerful medicines of one claſs fail, recourſe ſhould immediately be had to another. Seneka root in liberal doſes ſometimes anſwers every intention, and operates powerfully by the ſkin, the kidneys, and the

(a) A ſimilar caſe is recorded by Dr. Simſon, in the Edin. Med. Eſſays, Vol. 6. p. 126.

the bronchial glands, to the great relief of the patient. But if the moſt active medicines prove ineffectual, and the aggravation of all the ſymptoms threaten almoſt inſtant diſſolution, might not the *paracenteſis* of the lungs be attempted with ſafety, and advantage? *Melius eſt anceps remedium quam nullum*, is an eſtabliſhed maxim in phyſic, and certainly in this inſtance would juſtify the trial of an operation which is neither very painful, nor likely to be attended with any dangerous conſequences. Many caſes have been recorded of wounds in the lungs, which have been healed, without much difficulty. Nor have ſuch accidents been ſucceeded by an *emphyſema*; for it may be concluded from Mr. Hewſon's ingenious experiments that a puncture or inciſion will not occaſion any emiſſion of air, into the cavity of the *thorax*, on account of the effuſion of blood, and ſubſequent inflammation, by which the divided veſicles are firſt filled, and afterwards entirely

closed. To produce a discharge of air, a laceration or superficial abrasion of the lungs seems to be necessary; and hence it is that fractured ribs are the most frequent causes of the *emphysema*.

Should the *paracentesis* of the lungs ever be deemed expedient, the chest may be perforated by cautiously dissecting with a knife, as in the operation for the *empyema*. If the lungs adhere to the *pleura* where the incision is made, they may be punctured with a lancet, and the water will thus be discharged without falling into the cavity of the *thorax*; but a trocar will be necessary to obviate as much as possible this inconvenience, if there be no adhesion. The operation, for evident reasons, should first be performed on the right side, and if this do not afford the patient sufficient relief, another opening may be made between the seventh and eighth ribs of the left side, in order to avoid the *pericardium*.

CASE

CASE OF A PALSY, ARISING FROM THE EFFLUVIA OF LEAD, IN WHICH ELECTRICITY WAS SUCCESSFULLY EMPLOYED.

ELECTRICITY, like all other active remedies, may prove injurious as well as beneficial to the human body; and it is to be regretted that experience has not yet ſupplied us with any certain *criteria*, by which to determine when it will be hurtful, when innocent, or efficacious. That analogy may deceive us is evident from many examples. A girl, about ſixteen, who had loſt the uſe of her arm, which was greatly waſted, became univerſally paralytic, after being electrified; and remained ſo above a fort-

night. The general palſy was removed by proper medicines; but the diſeaſed arm continued as before. Electricity was again tried, and repeated three or four days, when the girl became a ſecond time univerſally paralytic, and even loſt the uſe of her tongue. By a courſe of medicine ſhe was once more relieved from this additional palſy; but the original one, which affected her arm, remained incurable. *(a)* A gentleman, aged forty-eight, inclined to corpulency, and of a phlegmatic temperament, had a paralytic affection of the leg and thigh. Electricity was tried, but the ſlighteſt ſhocks always increaſed the torpor of the limb. The ſame gentleman, twelve months afterwards, was attacked with an *hemiplegia*. To gratify his inclination, and contrary to my own judgement, I conſented to the uſe of electricity a ſecond time: and this remedy, which had before proved

(a) Vid. Philoſ. Tranſact. Vol. 48, p. 786; alſo, Prieſtley's Hiſtory of Electricity, p. 386.

proved injurious, was now at leaſt innocent, and even thought to be beneficial to him.

The electrical ſhock incautiouſly communicated, may be productive of dangerous and even fatal conſequences. Mr. R. aged fifty, ſubject to various nervous and hypochondriacal complaints, after ſuffering ſeveral ſlight paralytic affections, which yielded to medicine, was at length deprived of the uſe of one ſide. Electricity, and other active remedies, were applied. Gentle ſhocks were repeatedly given by a ſkilful perſon; and the patient ſeemed to receive benefit from each operation. But by an unfortunate miſtake in the poſition of the chain, the ſhock was one day conveyed through the epigaſtric region, and not along the paralytic arm, which reſted upon it. A violent pain was inſtantly perceived in the ſtomach, which in a few minutes was ſucceeded by a profuſe vomiting of blood. The hæ-

morrhage continued two or three days, and ſo exhauſted the ſtrength of the patient, as certainly to accelerate, and perhaps to occaſion his death.

PALSIES frequently ſucceed the *colica pictonum*, whether owing to ſome nervous ſympathy between the bowels and the limbs, or to the tranſlation of any morbid acrimony, cannot eaſily be determined. In ſuch caſes, the waters of Bath in Somerſetſhire are highly beneficial; and electricity, it is probable, would be a uſeful auxiliary to them. When the circumſtances of the patient render a journey to thoſe celebrated ſprings impracticable or inconvenient, the latter remedy may be tried alone with ſome proſpect of ſucceſs. Of this the following curious caſe, communicated to me by Dr. Withering, affords a preſumptive proof.

JOSEPH

"JOSEPH ADAMS, aged 20, was admitted into the Stafford infirmary on the 16th. of September, 1768. Some months ago he felt a numbneſs and coldneſs in the left leg and thigh, which gradually extended all over him, his head excepted, which is now the only part he can move. His limbs are often ſeized with involuntary twitchings, as in the *chorea ſ. vitæ*. Pulſe natural. Appetite good. Coſtive. This man was formerly uſed to work in lead mines, at which time he was often ſenſible of a ſweet taſte in his mouth; but for two years paſt has been employed in digging a navigable canal, and has been much expoſed to wet and cold. An antimonial vomit, a mercurial purge, and an emulſion, with a large proportion of *ol. olivar.* were preſcribed.

ON the 21ſt. He could move his right arm, and his legs a little, as he lay in bed. A number of ſmall electrical ſhocks

ſhocks were paſſed through both arms, and ordered to be repeated daily.

23d. Sweats after being electrified; is univerſally warmer; can ſtir his left arm.

24th. Feels a tingling in his right arm. His fingers contract upon the chain, when the ſhock paſſes. The frequency of his pulſe is not increaſed during the operation. Electrify all his limbs.

27th. Can ſhut both his hands, and bring the right up to his mouth, when lying in bed; but not when raiſed up.

29th. Feels the ſhocks more ſenſibly than he did at firſt. They always excite a ſtrong tingling ſenſation. When raiſed upon his feet, can ſtand upright betwixt two aſſiſtants.

At this time it was diſcovered that he had ſeveral venereal ſhankers, and an ulcer

cer upon the *glans penis*. The electricity was discontinued, and a course of sublimate solution, and mercurial unction entered upon; by which means all the venereal symptoms were subdued.

November 30th. His paralytic complaints being just in the same state as on the 29th. of September, recourse was again had to the electrical machine; and two large spoonfuls of *ol. olivar.* were given twice a day, to prevent costiveness.

December 18th. Sweats when electrified: has more motion in his body; feeds himself in bed, but cannot when up. The fingers sometimes drawn inwards, so as almost to touch the palms of his hands; his arms and legs always benumbed, except for a short time after the use of the machine.

28th. Palsy much the same; for the relief gained at the time of electrifying

ing ceaſes in a ſhort time after it is over. Continues very coſtive. The antimonial vomit was repeated; a drachm of *pilul. gummos.* ordered to be taken twice in a day, with three ounces of the decoction of Peruvian bark. Omit the electricity.

January 10th, 1769. These medicines at firſt gave him ſtools, but they have not now that effect. The palſy in the ſame ſtate. Complains of great pain in the right ſhoulder, and right ſide of the neck. A bliſter was applied to the neck, the pills continued, and the bark decoction changed for four ounces of paralytic infuſion. An ounce of volatile liniment was ordered to be rubbed daily upon the ſpine; iſſues to be made in the thighs; and when the bliſter healed, a ſeton in his neck. He continued nearly in this method until the 12th. of April, without any other advantage than being free from his pains. He was ordered into

into the warm bath, every other day, and to take as much of the freſh leaves of cuckow pint * twice every day, as his ſtomach would bear.

May 3d. The cuckow pint creates an uncommon heat in his ſtomach, but produces no other ſenſible effect. Let bliſters be applied to his legs, and afterwards to the lower part of the ſpine.

28th. The palſy continuing in the ſame ſtate, recourſe was again had to electricity.

Auguſt 21ſt. Has improved, though very ſlowly, in ſtrength and motion. The muſcles of his back allow him to ſtoop, and raiſe himſelf again: the right arm nearly as ſtrong as when in health; but for more than a week paſt his palſy has continued the ſame, and he complains of griping

* Arum Maculatum, *Linnæi* Species Plantarum.

griping pains in his belly, which is tenſe and very coſtive. The uſual medicines not giving him ſtools, let him take a large ſpoonful of caſtor oil every morning. Continue the electricity.

September 6th. FREE from the pain in his belly; the caſtor oil purges him conſiderably. Has more uſe in his left arm, and ſweats profuſely after electrifying.

13th. STOOD himſelf to day.

November 10th. CAN raiſe himſelf from his chair, and ſtand without help.

22d. WALKS about, with the aſſiſtance of his chair.

December 17th. DURING this month was a good deal afflicted with the gravel, which gave way to the uſual remedies.

27th. WALKS with one ſtick.

January

January 3d, 1770. BEGINS to walk without a ſtick. From this time he continued mending until the 11th. of May; when he was diſcharged perfectly cured.

THE firſt circumſtance that ſtrikes our attention in the hiſtory of this diſeaſe is the diſtance of time betwixt the patient's expoſure to the deleterious *effluvia* of the lead mines, and the appearance of the palſy. That the palſy was occaſioned by lead is moſt probable; as there ſeemed to be through the whole of the cure, more or leſs of the *colica pictonum* exiſting. The effects of the caſtor oil in this diſeaſe are too evident to paſs unnoticed; eſpecially as I have heard ſome very ingenious and candid practitioners aſſert, that they have found no more purgative quality in that oil, than in an equal quantity of olive oil. The medicine they uſed muſt have been highly adulterated.

THAT electricity does not afford relief

in

in paralytic complaints, after five days application, has been aſſerted by a very ingenious philoſopher; and I am afraid it is an opinion which has been too generally received. Dr. De Haen in his *Ratio Medendi* produces inſtances to the contrary; but none more ſtriking than the above caſe, wherein it appears that the palſy continued in the ſame ſtate, whenever the ſhocks were omitted. Patients are frequently diſcouraged by the painful ſenſation which large ſhocks excite, from perſevering in an electrical courſe; and it is not uncommon to find, that any given degree of ſhock will occaſion more pain in a diſeaſed, and even in a paralytic limb, than in a ſound one: I cannot omit adding, that I have never met with a caſe which reſiſted the power of ſmall and repeated ſhocks, that would yield to great and terrifying ſtrokes. Like other active and uſeful remedies, electricity may be given in too large a doſe, and may then produce conſiderable miſchief.

miſchief. Nor are there wanting ſeveral well authenticated facts, to ſupport this opinion. The largeſt ſhock I have ever found uſeful, has been from an eight ounce phial, coated in the common manner; and even this in many irritable habits, is conſiderably too ſtrong. For there is an amazing difference in the ſenſibility of different conſtitutions to the electrical ſtimulus. Quick, lively people feel the moſt from it; thoſe the leaſt, who are dull and ſlow of apprehenſion.

CASES OF OBSTINATE CHOLICS, CURED BY THE USE OF ALUM.

A DUTCH writer of conſiderable merit, but not generally known in England, has recommended the uſe of alum in the *colica pictonum*, and in other obſtinate and painful affections of the bowels, and has favoured the public with ſeveral well authenticated hiſtories of its beneficial effects. *(a)*

I HAVE

(a) De Colica Pictonum Tentamen, & Appendix, auctore, Joanne Graſhuis, M.D.

"Cura-

I HAVE administered this remedy in about fifteen cases; with a degree of success which confirms his testimony, and induces me to propose it to the trial of other physicians. The dose in which I have given it, has usually been, from ten to twenty

"CURATIONIS methodus (colicæ scilicet pictonum) quatuor indicationibus absolvitur. Expostulat 1. lenimen doloris, nulla habita ad causam specialem ratione. 2. Causæ proximæ vel ablationem vel extinctionem. 3. Partium affectarum in integram, quantum fieri possit, restitutionem. 4. Alvi interea temporis, difficillime in plerisque constipatæ, toto curationis decursu exsolutionem. Prima indicatio anodyna exposcit; secunda demulcentia; tertia roborantia. Sine his, levatio morbi duabus prioribus indicationibus impetrata, raro tuta fidaque est, hisce solis aliquando curatio integre absolvitur absque ullo aliorum extradictis jam indicationibus præsidio. Siquidem haud raro vidi morbum anodynis & demulcentibus, seorsum et per se, vel combinatis; sat magna copia & satis diu assumptis, vinci non potuisse: in quibus casibus omni spe sanationis impetrandæ abjecta, roborantibus fortioribus non calidis, ut intestinorum tonus relaxatus emendaretur, adhibitis, invincibilem ut videbatur hostem profligari feliciter. Quare hæc methodus a me tentata, deinceps mihi maxime commendabilis fuit; eoque felicior quo medicamentorum adstrictoria potentia major, eorumque propinatio liberalior diuturniorque."

De Colica Pictonum, p. 48.

twenty grains, mixed with an equal proportion of ſugar. When there was reaſon to apprehend that it might be too rough and auſtere in its action, I have directed it to be combined with gum arabic or *ſperma ceti:* and in caſes of flatulence, when a warm opiate was indicated, half a ſcruple of the *philonium Londinenſe*, made a uſeful addition to it. Fifteen grains of alum given every fourth, fifth, or ſixth hour, for the moſt part prove gently aperient; and when the ſymptoms are not very ſevere, the ſecond or third doſe ſeldom fails to mitigate the pain, and ſometimes entirely removes it. This remedy when continued for a ſufficient length of time, ſeems to abate flatulence, to obviate ſpaſm, to improve the appetite, and to ſtrengthen the organs of digeſtion. On theſe tonic powers the virtues of alum muſt chiefly depend; though they may in part ariſe from its obtunding the morbid ſenſibility of the inteſtines, by an immediate action on their nerves.

To

To theſe it is applied more quickly, forcibly, and through a larger extent than moſt other aſtringents, from its ready ſolubility, great ſtypticity, and unchangeable nature. But without diſcuſſing the mode of its operation, I ſhall briefly relate the two following hiſtories, ſelected from ſeveral others, of its ſalutary effects.

CASE I.

January 28th, 1772. Mr. G. aged thirty, a temperate and active man, had been ſubject more than twelve months, to a violent pain in the right *hypogaſtrium*, which often recurred periodically and continued two or three days, leaving a yellowneſs of the countenance, and great ſoreneſs of the *abdomen*. His belly was moderately ſoluble, and his pulſe regular in the ſhort intervals of his fits. For as he lived at a diſtance from Mancheſter, I had no opportunity of ſeeing him in the

paroxyſms of his diſorder. The diagnoſtics of this caſe were obſcure, but from a ſuſpicion that his pain might be in the courſe of the ureter, I directed the following medicines.

℞. *Pulv. uvæ urſæ* ℥*j. Aluminis uſti* ℥*ſs. M. f. Pulvis in doſes* 24 *æquales dividendus; quarum capiat unam ter die, ex unciis tribus decocti ſequentis.*

℞. *Rad. petroſelini. paſſular. ſolis. exacinat. aa* ℥*j. Semin. & ſummit. dauci ſylv. herb. parietar. aa* ℥*ſs. aq. fontanæ* ℔*iij. coque ad* ℔*ij. colaturæ & adde ſp. nitri dulcis* ℥*j. aq. junip. com.* ℥*iij. M.*

These remedies were continued three weeks, and during the uſe of them the patient ſuffered no return of his diſorder. The medicines proved diuretic, but he diſcharged no gravel, nor did his urine at this time aſſume any remarkable appearance.

Mr.

Mr. G. now conſidered himſelf as cured, and therefore neglected the repetition of his powders. In leſs than a month his cholic recurred with great violence; and, April 27th, 1772, he again applied to me for advice. I preſcribed fifteen grains of burnt alum, and the ſame quantity of ſugar, to be taken twice every day, in any agreeable vehicle, during the ſpace of ſeven or eight weeks. And by ſteadily perſevering in this courſe, he has remained ſix months entirely free from his diſorder.

CASE II.

September 21ſt, 1772. E. P. a houſe-painter, aged 28, had complained ſeveral days of a violent pain in the region of the navel, attended with a ſlight nauſea, and frequent cramps in the extremities. Sixteen hours before I ſaw him he had taken two doſes of caſtor oil, which

had yet procured no ſtool, nor afforded any relief. He was now afflicted, during the ſhort remiſſions of his cholic, with very ſevere pains in his arms and ſhoulders. His countenance was yellow; his pulſe beat about ſeventy five ſtrokes in a minute; and his feet were cold. I directed him to go into the warm bath in the evening; and to take the following bolus every ſixth hour.

℞. *Spermatis ceti. aluminis rup. aa* ℈*j. ſyr. ſimplicis q. s. M. f. bolus.*

THE pain was much abated by the uſe of this medicine, before he tried the warm bath.

April 27th. HE had taken ſeven doſes of alum, and was entirely free from pain; but remained extremely coſtive. The bolus was therefore omitted; and a ſolution of the cathartic ſalt in barley-water was ordered to be given at proper inter-

intervals, till ſeveral ſtools were procured. The ſucceeding day he continued eaſy, but to prevent a relapſe, I preſcribed a ſcruple of alum mixed with an equal quantity of ſugar, to be ſwallowed twice every day, during the following week or fortnight. The patient ſoon recovered his health and ſtrength, and I have reaſon to believe has remained ever ſince free from his diſorder.

CASES

CASES

IN WHICH THE

WARM BATH

WAS

SUCCESSFULLY EMPLOYED.

THE uſe of WARM BATHING is of great antiquity. Hippocrates recommends it in the ſtrongeſt terms. *Calidum, ſeu Therma cutim emollit, attenuat, dolores tollit, rigores, convulſiones, nervorum diſtenſiones mitigat, capitis gravitatem ſolvit.* (a) Ariſtotle, Pliny, Galen, and Celſus,

(a) Hippoc. Aph. 22. Sect. 5.

Celſus, have given their teſtimony in its favour. The Romans derived this practice from the Greeks, and regarded it both as an efficacious remedy, and as one of the higheſt enjoyments of luxury. But under the reign of Auguſtus Cæſar, who was cured of a lingering and dangerous malady, by the uſe of cold bathing, the warm bath fell, for a ſhort time, into diſrepute. This appears from Horace:

Sane Myrteta relinqui
Dictaque ceſſantem nervis elidere morbum
Sulfura contemni; vicus gemit; invidus ægris
Qui caput & ſtomachum ſupponere fontibus audent,
Cluſinis, Gabioſque petunt, & frigida rura.

Hor. Ep. xv.

VAPOUR bathing, as I am well informed, is a univerſal practice amongſt the native Indians of North America. When afflicted with the rheumatiſm, a diſeaſe to which, from their climate, mode of life, and rigid fibres, they are peculiarly incident,

dent, they ſhut themſelves in a cloſe place, and pouring water upon a large ſtone, heated to a ſufficient degree, they expoſe themſelves for a conſiderable time to the ſteams which ariſe from it. Covered with a profuſe ſweat, they then plunge into the cold bath; and afterwards receive the hot vapours as before, repeating for the moſt part twice or thrice theſe ſevere operations. A ſimilar practice prevails in Ruſſia and Siberia; and every perſon in thoſe countries, from the ſovereign, to the meaneſt peaſant, uſes twice in a day ſuch artificial hot baths. The Abbe Chappe d'Auteroche, who travelled into Siberia in the year 1761, by order of the King of France, informs us that the heat of theſe baths is raiſed to 148, and occaſionally even to 168 degrees of Farenheit's thermometer. In this intenſe heat the Ruſſians ſometimes remain two hours, pouring hot water frequently over their bodies; and then ruſh into the open air, diſſolved in ſweat, to roll themſelves in the

the ſnow, during the moſt piercing froſt, when the thermometer ſtands ten degrees below 0. Many chronic diſeaſes are cured by this method of bathing; and the rheumatiſm is ſaid to be almoſt unknown in Ruſſia.

PROSPER ALPINUS relates that warm baths are uſed by the Egyptians, in all fevers except thoſe of the peſtilential kind; and in a variety of other diſorders. They are employed alſo by the females of that country, eſpecially by the Hebrew women, to render them more corpulent. "*Quod ut obtineant, multis diebus, dulcibus tepidis Balneis indulgent, in iiſque diu morantes, comedunt, potant, clyſteribuſque ibi ex variis pinguedinibus, ac adipibus paratis utuntur, multaque etiam medicamenta per os aſſumunt.*

IN England warm bathing is rarely employed in private practice, notwithſtanding ſeveral modern writers of reputation

tation have ſtrongly recommended it; and the experience of ages hath evinced its utility. To excite more attention to a remedy, which though well known is too much neglected, I ſhall briefly relate a few caſes in which it proved eminently ſucceſsful.

CASE I.

January 14th, 1770. A young gentleman, of an irritable habit, after drinking freely and ſwallowing a large quantity of Cayenne pepper, was ſeized with an inflammatory *angina*. The fever, ſwelling of the *fauces*, laborious reſpiration, difficult deglution, and violent pain in the head, were ſucceeded by a delirium; and although theſe ſymptoms were in ſome degree mitigated by venæſection, cathartics, bliſters, leeches applied to the throat, *pediluvia*, and by nitrous and antimonial medicines, yet they continued with great ſeverity,

ſeverity, and the patient paſſed ſix days and nights without enjoying the leaſt ſlumber. Under theſe circumſtances (January 20th) the warm bath was preſcribed, and the young gentleman directed to ſit in it half an hour. The delirium ſoon abated; he fell into a profound and refreſhing ſleep, in which he continued thirteen hours; and then awoke entirely free from fever or delirium. And in a ſhort time he recovered his uſual health and ſtrength.

CASE II.

MASTER S. P. aged two years, healthy but of a delicate make, and with a head larger than is natural, was ſeized Auguſt 13th, 1771, at one o'clock in the morning, with ſevere convulſions. He had been ſlightly indiſpoſed a day or two before, and the preceding evening a few eruptions were obſerved on his face and neck.

neck. His ſiſter was juſt recovered from the ſmall pox, and he had not been ſeparated from her during her illneſs, ſo that there remained no doubt concerning the cauſe of theſe ſymptoms. An emetic was adminiſtered, and a laxative clyſter afterwards injected. But the fits continued with great violence, recurring at ſhorter and ſhorter intervals, notwithſtanding the application of a bliſter to the back, an antiſpaſmodic liniment to the ſpine, and the aſſiduous uſe of paregoric elixir, fœtid *ſal volatile*, muſk, camphor, the *pediluvium*, &c. The child's ſtrength was now almoſt exhauſted, his reſpiration became laborious, his extremities cold, his pulſe trembling, quick and languid, and his face was alternately fluſhed, and of a cadaverous paleneſs. The variolous eruption neither increaſed nor receded.

Such was the ſituation of my little patient at eleven o'clock at night, when I directed him to be immerſed, as high

as

as the chin, in warm water. The relief this afforded was almoſt inſtantaneous. Every convulſive motion ceaſed, his breathing became free and regular, he took notice of thoſe around him, and ſeemed ſenſible of the preſent eaſe he enjoyed. He remained in the bath about ten minutes, and was much refreſhed by it, but had a fit not long afterwards: This however was very ſlight, and yielded immediately to a clyſter prepared of a ſtrong infuſion of Valerian root and aſſafætida, with a few drops of tinct. Thebaica which was in readineſs, and ſhould have been injected on his coming out of the water. He retained the clyſter only a few minutes, but paſſed the reſt of the night in a compoſed and comfortable ſleep, and the next morning the eruption was univerſal. The puſtules were diſtinct, but ſo ſlow in ſuppurating, that they died away without coming to any degree of maturity, although a cordial diet was enjoined, the bark preſcribed, and ſmall doſes of ſul-

phur, mixed with ſyrup of poppies, were frequently adminiſtered.

CASE III.

MRS. H. aged thirty-five, a lady of a tender conſtitution, ſubject to ſcorbutic eruptions, and enfeebled by frequent child bearing, received in the beginning of January 1770, a ſevere ſhock by the untimely death of an infant at the breaſt, which occaſioned a miſcarriage and profuſe uterine hæmorrhage. A variety of hyſterical ſymptoms ſucceeded, and gradually increaſed. February 18th, my aſſiſtance was deſired. She was then afflicted with great languor of body, and dejection of mind, with flatulence, want of appetite, and a violent ſenſe of ſuffocation in her throat. Every morning a *delirium* came on, attended with ſevere convulſions. Her pulſe was quick, fluttering, and irregular; her ſkin was dry,

and

and ſince her miſcarriage free from any eruption; and ſhe complained of an oppreſſion about the *præcordia*. A bliſter to the head was directed; a cordial and nouriſhing diet recommended; and the frequent uſe of the *pediluvium* enjoined. The following medicines were alſo preſcribed.

℞. *Aſſafætidæ electæ gr. xv. Pulv. Ipecac. extract. Thebaic. aa gr. j. Ol. Menthæ gutt. ij. ſyr. ſimp. q. s. M. f. Pilulæ mediocres omni nocte hora ſomni ſumendæ.*

℞. *Pulv. Cort. Peruvian. ʒj. Raſur. Ligni Guaiac. Saſafras, Cort. Winteran. Rad. Glycyrrhiz. aa ʒij. Aq. Font. bullient. ℔j. Infunde, vaſe clauſo per ſex horas, deinde cola.*

℞. *Colaturæ præſcriptæ ʒiſs. Tinct. Valerian. vol. Tinct. Caſtor. aa ʒj. M. f. Hauſtus ter die ſumendus.*

By theſe remedies ſhe was much relieved, and continued better till the 12th of March; when ſhe relapſed into all her former complaints, which recurred with an increaſed degree of dejection and anxiety of mind. Without my knowledge ſhe had tried the cold bath, and had been ſenſibly injured by it. No eruption yet appeared on her ſkin; and the delirium, which was more violent than before, now invaded her always in the evening. Troches of ſulphur and the compound lime water, with the pills mentioned above were at this time preſcribed; and the patient was directed to uſe the warm bath every night, previous to the acceſſion of the delirium.

March 13th. The delirium recurred with much leſs violence, and was of ſhorter continuance; and after bathing the patient fell into a ſound and compoſed ſleep.

March 16th. The warm bath was omitted, and the delirium was much more violent,

violent, and laſted longer. The following draught was directed to be taken an hour before its acceſſion, the ſucceeding evening, and the uſe of the bath to be repeated.

℞. *Sagapeni, Moſch. aa gr. x. Camphoræ gr. ij. Mucilag. Gum. Arab. q. s. ſimul tritis gradatim adde Aquæ Menth. vulg. ſimp.* ℥*iſs. Tinct. Valer. ſimp.* ℥*ij. Syr. è Cort. Aurant.* ℥*j. M. f. Hauſtus.*

By theſe means, aſſiduouſly purſued, the patient recovered her health before the end of March. Whenever the warm bath was omitted, which happened twice or thrice, ſhe ſuffered ſenſibly by the neglect. Her delirium was more ſevere, and of longer duration, her ſleep was ſhorter and leſs refreſhing, and the ſucceeding day ſhe was more troubled with anxiety of mind, oppreſſion about the *præcordia*, and other nervous ſymptoms.

CASE IV.

A LEARNED and very benevolent clergyman, who reſides about forty miles from Mancheſter, conſulted me by letter in the beginning of March, 1769. He had been ſeveral years afflicted with a variety of hypochondriacal complaints, which had ſucceeded the ſudden repulſion of an eruption on his foot, by means of an aſtringent bath; and he was then under a continual anxiety and diſtraction of mind. He had one prevailing idea conſtantly in his head, and one diſtreſſing image before his eyes. Theſe ſymptoms of his diſorder he aſcribed to a violent commotion of mind, at a time when he was under great depreſſion of ſpirits, and which occaſioned a ſudden ſtart, or convulſive motion, in one part of his head. In this part he felt a conſtant and forcible ſpaſm, which he ſuppoſed extended itſelf

to

to his breaſt and bowels, as he generally perceived a ſenſe of contraction in thoſe parts, attended with an inward heat. His eyes were particularly affected, being drawn as it were out of their ſockets, and endued with an unnatural ſenſibility. In a ſecond letter dated March 11th, he informed me that he perceived every night, when he lay in bed, a continual motion from his forehead upwards, and about his temples, like the undulation of waves. The uneaſineſs and pain in his head was ſo extreme, that he could not bear even the preſſure of his hat. But all this bodily pain was trifling in degree when compared to the diſtreſs of his mind, ariſing from the irreſiſtible force with which external objects diſtracted his eyes and imagination.

Under theſe unhappy circumſtances he had conſulted ſeveral Phyſicians of great eminence, and had tried a variety

of medicines, the detail of which, as well as of thoſe which I preſcribed to him, would be equally tedious and unneceſſary. Nothing had afforded him ſo much relief as the warm *pediluvium*, and the extract of opium, of which he had habituated himſelf to take ten or twelve grains every day. Medicine proving ſo ineffectual, I adviſed the gradual diſcontinuance of his opiates; recommended the frequent uſe of the warm bath; and directed hot water to be poured in a ſtream, upon the part of his head which was moſt affected. The following paſſages extracted from his letters, ſhew the beneficial conſequences of this courſe. "My days begin to be eaſier, and I have not had ſuch bad nights ſince I went into the warm bath, which is near two months ago. It has wonderfully ſoftened and compoſed my head, and enabled me to ſleep ſooner and ſounder than I uſed to do. I have made ſeveral attempts to uſe the cold bath along with it, but I am always obliged to deſiſt, as

it

it immediately alters me for the worſe, greatly increaſes the diſtreſs in my head, and renders my ſleep more diſturbed. I am however attempting it again; and I hope with a better proſpect of ſucceſs. I ſhould be much encouraged by finding myſelf able to bear it; as I am perſuaded it would have a happy effect in ſtrengthening and reſtoring me."—" I find myſelf daily advancing towards a more perfect ſtate of health. I have brought myſelf at length to bear the cold bath very well. I uſe it every other day, and find a very happy effect from it, in reſtoring my ſpirits and ſtrengthening my whole frame. But it would not do without the aſſiſtance of the warm bath, which is my conſtant antidote againſt any diſagreeable effects from the other, and gives me never failing relief and reſt at night. The pouring warm water, in a conſtant ſtream, upon that part of my head, where my complaint lies, has I apprehend, been of ſingular ſervice in ſoftening and opening it,

and

and contributed greatly to that happy change which I find in myself. I have been gradually weaning myself from opium; and have reduced the dose from three pills to one."

This gentleman soon recovered his health, and has been ever since free from any returns of his disorder.

I have recommended warm bathing in a variety of other complaints, and for the most part with the happiest success. Like other remedies, however, it has sometimes disappointed my expectations; and in two instances its operation proved in some degree unfavourable. The one case was a violent pain resembling the sciatica, but which I believe proceeded from an affection of the kidney. The other was a most troublesome sense of motion in the *uterus* from one side of the pelvis to the other, which occurred at the end of

of every fortnight, in the intervals between the *catamenia*, and lasted generally three or four days. The patient was free from this complaint when in a sitting posture; and it was most uneasy to her when she was walking. The warm bath aggravated the pain in the former instance; and seemed to protract the disorder a day or two in the latter.

MIS-

MISCELLANEOUS CASES AND OBSERVATIONS.

1. IT is highly probable that Palfies frequently arife from difeafes of the *viſcera*, without any previous fault in the brain or ſpinal marrow. And conſiderable errors may be committed in practice, by a want of preciſion in diſtinguiſhing the

the cauſes from which they proceed. Large evacuations are often indiſcriminately directed in theſe diſorders, from a ſuppoſition that they ariſe from plenitude; and thus irreparable miſchief is done in thoſe caſes of weakneſs or irritability, which are now moſt numerous.

I HAVE ſeen ſeveral *hemiplegias* which derived their origin from affections of the liver; others from an *atonia* of the ſtomach and bowels; and three inſtances have occurred to me of Palſies from pregnancy. The following hiſtory is of this kind.

MRS. D. of Rochdale, aged 21, whoſe *menſes* had always recurred with regularity, but attended with great pain and general diſorder, in the ſpring of 1771 had a miſcarriage. The following Auguſt the *catamenia* did not appear at the uſual period. She had a violent pain in the loins and about the *os ſacrum*, which continued

tinued ſeveral hours, and was then ſucceeded by a pain equally acute in her head. Soon afterwards ſhe loſt all power of ſpeech, and the uſe of her right ſide. Her habit was not plethoric, but an experienced and ſenſible Apothecary, before my arrival, had taken from her arm half a pound of blood, had applied a bliſter to her back, and a volatile liniment to the ſide affected. By theſe means ſhe recovered in about ſixteen hours the uſe of her ſide, but ſtill complained of a *torpor* in it, and of a dull pain and confuſion in her head. Her pulſe was ſoft and natural, and her blood of a proper texture. I conſidered the palſy as ariſing from an uterine affection; and directed a gentle purgative of rhubarb and magneſia every other night, and an infuſion of Peruvian bark and Valerian, to ſtrengthen the habit of the patient, and to abate irritability. Venæſection was alſo recommended a few days before the next period of the *catamenia*. At the return of this

this period ſhe had a ſecond paralytic ſtroke, of the ſame kind as before, and preceded by the like ſymptoms. Venæſection had been omitted, and ſhe had neglected her medicines. She was now evidently in a ſtate of pregnancy. I adviſed a repetition of the remedies before preſcribed; and recommended the uſe of a temperately cold bath. She complied with theſe injunctions, and had no return of her diſorder.

2. FULLER, in his *Medicina Gymnaſtica*, ſtrongly recommends COLTSFOOT in conſumptive diſorders. It appears to be anodyne and a corrector of acrimony; but only exerts theſe powers when taken in a large quantity. I gave a ſtrong infuſion of it to a young woman, who had various running ſores, hectic heats, a colliquative *diarrhœa*, and wandering pains all over her body. It produced a better digeſtion in the ulcers, alleviated her pains, and abated the violence of the

darrhœa.

diarrhœa. Cicuta, and Peruvian bark were before adminiſtered with good effect, but had been for ſome time diſcontinued, on account of their expenſiveneſs. I thought the *tupilago* afforded more relief to the patient than either of them.

3. LARGE doſes of opium have been frequently adminiſtered in painful and ſpaſmodic diſeaſes, not only with ſafety, but with the happieſt ſucceſs. A very learned and ingenious practitioner informs me that he lately gave to a lady in the fifth month of her pregnancy, who had an acute pain in her bowels, which threatened an abortion, twenty-two grains of the extract of opium, and three hundred drops of laudanum, in the ſpace of thirty-ſix hours. And by theſe means, and theſe alone, ſhe perfectly recovered. But the nervous ſyſtem, eſpecially in ſpaſmodic diſorders, is ſubject to great and ſudden changes, which muſt ſometimes render the doſes of medicines, powerful in their

their operation, uncertain and liable to produce the moſt dangerous effects. The following caſe, communicated to me by a young phyſician, who is likely to be an ornament to his profeſſion, affords a ſtriking confirmation of the truth of this obſervation.

A YOUTH, who was admitted into the hoſpital at —— on account of a violent ſpaſmodic diſeaſe, which recurred periodically in the evening, after trying a variety of remedies, was directed to take the *extractum Thebaicum* in ſuch a quantity as might prove ſufficient to mitigate the violence of the paroxyſms. The doſe amounted to twenty-two grains, and was repeated every night, during the ſpace of a week, without producing any ſoporific effects. On the eighth night it was obſerved that he had no return of the ſpaſm; and in the morning he was found dead. It is probable that a ſudden alteration had taken place in the nervous ſyſtem of this

patient, and that the opium, in conſequence of it, exerted with full force its uſual powers on the body.

4. I HAVE lately received from a clergyman of great learning and humanity, a ſmall quantity of ſeed, which is brought from the coaſt of Malabar, and is celebrated in the Eaſt Indies as a powerful remedy for the cholic. It is called by the Portugueſe AJAVA. "Captain B. formerly commander of the Prince Henry Indiaman, procured ſome of it from the Jeſuit's College at Goa, brought it over with him to England, and diſtributed it amongſt ſuch of his neighbours and acquaintance as were troubled with the cholic, who found great benefit from the uſe of it. Being himſelf exceedingly afflicted at times with the windy gout, and having in one of his fits applied ſeveral things in vain, he made trial of the *ajava ſeed*, and found it ſo very efficacious in expelling the wind, and removing the

gout

gout from the ſtomach and head, that he has ever ſince taken it on the like occaſions. The moſt uſual effect of it is to procure a plentiful diſcharge of wind, and ſometimes it relieves the diſorder by a ſtool or two." From the ſenſible qualities of this ſeed, I ſhould judge it to be an active remedy: But I have yet had no experience of its efficacy, and I mention it only to promote an enquiry into its medicinal virtues.

5. A LADY, aged 40, was ſubject ſeveral years to an exceſſive degree of acidity in her ſtomach and bowels, which medicines ſometimes palliated, but never cured. By degrees the acidity abated, and at length entirely ceaſed; but ſhe became ſubject to frequent diarrhœas, to a *profluvium menſium*, and to copious and ſudden diſcharges of urine. She complained of great feebleneſs, of wearineſs in her legs, and of a conſtant pain in her loins. Her pulſe was languid and ſlow,

her ſkin cold, of a dark hue, and covered with freckles. She had often a putrid taſte in her mouth, at which time the ſaliva was tinged with blood; and in the intervals of her *menſes* ſhe had a continual diſcharge of brown, fœtid water from the *uterus*.

These ſymptoms are characteriſtics of a true ſcurvy or diſſolution of the blood; which in this inſtance ſeems to have been produced by the long continuance of an acid acrimony in the firſt paſſages. Dr. Gaubius has well deſcribed the effects of ſuch an acrimony. *Acor primis maxime viis infeſtus, tempore & ſanguinem humoreſque inde deductos ſubiens, naſcitur ex uſu diuturno acidorum aut aceſcentium, quæ viribus corporis non ſubiguntur; aut quia ex ſe indomabilia ſunt naturæ humanæ, aut ob virtutis coctricis impotentiam. Debilitas igitur ſolidorum univerſalis, aut privata viſcerum primæ digeſtionis; irritabilitas regulares horum motus turbans; inertia defectuſve ſuccorum præ-*

præparantium; circulationis & caloris naturalis languor; neglectus motus animalis, eo disponunt, ut pateat, cui maxime ætati, sexui, vitæ generi, hoc acre frequentius eveniat. (a)

To determine the comparative nutritive powers of different foods, a few years ago a Physician, of distinguished abilities, made a variety of experiments, to which he at length fell an unfortunate sacrifice. I have been well informed that he lived a month upon bread and water only, by which he daily diminished in his weight. At the end of that time, he added sugar to his bread and water, and confined himself a fortnight longer to this diet. His breath then became offensive, his gums bled, putrid sloughs appeared in his mouth, and *vibices* spread themselves over different parts of his body. These symptoms were removed by a return to animal diet, and by the use of the bark.

(a) Gaubij Pathologia, Sect. 307.

IT is contrary to the prevailing THEORY, that vegetable food ſhould give riſe to putrefaction in the animal ſyſtem; but there are many proofs of the truth of it. Doctor Biſſet relates ſeveral caſes of highly putrid fevers, quick in their progreſs and fatal in their termination, wherein the ſeptic ferment evidently began in the *primæ viæ* after eating heartily of aceſcent food. Calves alſo put to graze in a rich paſture, towards the cloſe of autumn, are ſometimes affected with a putrid diſeaſe, which deſtroys them in thirty hours. The farmers call it the *quarter felon*, becauſe one hind quarter becomes putrid and emphyſematous; and as ſoon as the *emphyſema* extends to the ſpine, the animal expires: It is moſt incident to calves that are healthy. Juices, which are perfectly animalized or aſſimilated, are leſs prone to putrefy than ſuch as are crude, or blended with a great proportion of aceſcent chyle. The meat of bullocks and of ſheep which have been kept faſting a ſufficient

ſufficient length of time before they are killed, that is till the recent chyle be completely aſſimilated, is firmer and continues ſweet much longer, than the fleſh of ſuch as are ſlaughtered ſoon after taking them from their paſtures. *(b)*

THE learned writer whom I have quoted above obſerves. *Dulciaria, ſaccharata, mellita, hiſque ſimilia, uſu immodico, per occultam acrimoniam dentibus inimica ſunt; pro vi ſua fermentante, acidum ingenerant, et quæ ex hoc profluunt mala; præterea ſolvunt tenuantque humores; horum minuta denſitate et firmas partes relaxant; non uno hinc nomine generi nervoſo infeſta, infantibus, ſexui ſequiori, debilibus, hyſtericis, hypochondriacis, obſunt. (c)*

FROM the uſeful and accurate experiments of Sir John Pringle it appears that

(b) Vid. Biſſet's Medical Obſervations, p. 85.
(c) Gaubij Pathologia, Sect. 470.

bread, water, and freſh gall, when fermented together, firſt turned ſour, then putrid. And Doctor Bryan Robinſon found that perſpiration is diminiſhed by fruit, and garden vegetables. Perhaps theſe facts may reflect ſome light on the preceding obſervations.

6. Mr. William White of York, the ingenious author of an Eſſay on the Diſeaſes of the Bile, has lately communicated to me ſome curious experiments on the ſolution of thoſe calculous concretions, which are called gall ſtones. He has diſcovered that *alcohol* ſaturated with *oleum terebinthinæ æthereum*, quickly and totally diſſolves them. And induced by the powerful action of this *menſtruum* out of the body, he has adminiſtered it internally with ſome degree of ſucceſs; and is deſirous of recommending it to the trial of others. Such a remedy, if it prove effectual, muſt be regarded as a valuable addition to the *materia medica*. But if we

conſider

conſider the peculiar œconomy obſerved by nature in the circulation of the blood through the liver; the long ſtagnation of the bile in the gall bladder; and the quickneſs with which *alcohol* and oil of turpentine paſs off by urine and perſpiration, it is to be feared that ſuch a *menſtruum*, powerful as it may be, will ſcarcely reach the ſolvend. To this objection alſo we may add, that the diagnoſtics of the diſeaſe are often obſcure and uncertain. The ſame gentleman informs me, that he was not long ſince preſent at the diſſection of a woman, who had laboured ſeveral months under an obſtinate jaundice, attended with violent and periodical pains in the region of the liver, with coſtiveneſs, white ſtools, and other ſymptoms of biliary concretions. No ſuch cauſe however was found; but a large ſchirrus, extended itſelf from the *pylorus* along the *duodenum*, ſo as to cloſe the orifice of the *ductus communis*, and thus prevent the paſſage of the bile into the inteſtines. But

I mean

I mean not to discourage, and wish rather to promote the trial of a medicine, which is active in its properties, and yet unlikely to prove injurious in its operation. Such experiments are justified by a maxim well known, and of undoubted authority in physic.

7. I COMMUNICATED some time ago to Doctor Priestley, the history of a putrid fever, in which the injection of mephitic air into the intestines, was attended with very beneficial effects. The Doctor has annexed it to his papers on factitious air, which will probably be published in the next volume of the Philosophical Transactions. A case, of the same kind, has very lately occurred to me; and I shall here briefly relate the most important particulars of it.

ELIZABETH GRUNDY, aged seventeen, was attacked on the 16th of December, 1772, with the usual symptoms of a continued

tinued fever. The common method of cure was purſued; but the diſeaſe increaſed, and ſoon aſſumed a putrid type. On the 23d, I found her labouring under a conſtant *delirium*, with a *ſubſultus tendinum*: Her ſkin was hot and dry, her tongue black, her thirſt immoderate, and her ſtools were frequent, extremely offenſive, and for the moſt part involuntary. Her pulſe beat about 130 ſtrokes in a minute; ſhe doſed much; and was very deaf. I directed wine to be adminiſtered freely; a bliſter to be applied to her back; the *pediluvium* to be uſed ſeveral times in the day; and mephitic air to be injected, under the form of a clyſter, every two hours. The next day her ſtools were leſs frequent, had loſt their fœtor, and were no longer diſcharged involuntarily; her pulſe was reduced to 110 ſtrokes in a minute; and her *delirium* was much abated. Directions were given to repeat the clyſters, and to ſupply the patient liberally with wine. Theſe means were aſſiduouſly

ouſly purſued ſeveral days; and the young woman was ſo much recruited by the 28th, that the injection was diſcontinued. She was now quite rational, and not averſe to medicine: A decoction of the Peruvian bark was therefore preſcribed; by the uſe of which ſhe ſpeedily recovered her health.

PRO-

PROPOSALS

FOR ESTABLISHING MORE

ACCURATE AND COMPREHENSIVE

BILLS

OF

MORTALITY.

Fluminis ritu feruntur.

HOR.

Fas est et ab hoste doceri.

Ovid. Metam.

PROPOSALS FOR ESTABLISHING MORE ACCURATE AND COMPREHENSIVE BILLS OF MORTALITY IN MANCHESTER.

THE eſtabliſhment of a judicious and accurate regiſter of the births and burials, in every town and pariſh, would be attended with the moſt important advantages, medical, political, and moral. By ſuch an inſtitution, the increaſe or decreaſe of certain diſeaſes; the comparative healthineſs of different ſituations, climates, and ſeaſons; the influence of particular trades and manufactures on longevity; with many other curious circumſtances, not more intereſting to Phyſicians,

ficians, than beneficial to mankind, would be aſcertained with tolerable preciſion. In a political view, exact regiſters of human mortality are of ſtill greater conſequence, as the number of people and the progreſs of population in the kingdom, may in the moſt eaſy and unexceptionable manner, be deduced from them. They are the foundation likewiſe of all calculations concerning the values of aſſurances on lives, reverſionary payments, and of every ſcheme for providing annuities for widows, and perſons in old age. In a moral light alſo ſuch *tables* are of evident utility, as the increaſe of vice or virtue may be determined, by obſerving the proportion which the diſeaſes ariſing from luxury, intemperance, and other ſimilar cauſes bear to the reſt; and in what particular places diſtempers of this claſs are found to be moſt fatal.

A FEW examples may perhaps confirm and illuſtrate theſe obſervations. In the Pais

Pais de Vaud, a diſtrict of the province of Bern in Switzerland, and in a country pariſh in Brandenburgh, 1 in 45 of the inhabitants die annually; and at Stoke Damarell in Devonſhire, 1 in 54; whereas in Vienna, and Edinburgh, the yearly mortality appears to be 1 in 20; in London 1 in 21; in Amſterdam and Rome 1 in 22; in Northampton 1 in 26; and in the pariſh of Holy Croſs, near Shrewſbury, 1 in 33. In the Pais de Vaud, the proportion of inhabitants who attain the age of eighty, is 1 in 21½; in Brandenburgh 1 in 22½; in Norwich 1 in 27; in Mancheſter 1 in 30; in London 1 in 40; and in Edinburgh 1 in 42. Theſe facts afford a ſtriking but melancholy proof, of the unfavourable influence of large towns on the duration of life.—From the moſt accurate computation, London is found to contain 601750 inhabitants; and from 1759 to 1768, the burials have exceeded the chriſtenings every year up-

wards of 7000; which is the recruit the metropolis requires annually from the country, to ſupport the preſent number of its people. In 1757, a ſurvey was made of Mancheſter and Salford. The number of inhabitants then amounted to 19839; and the burials, excluſive of thoſe amongſt Diſſenters, were 778. But ſince that time the populouſneſs of Mancheſter has conſiderably increaſed. Half of all that are born in this town die under five years old. The iſland of Madeira is ſo remarkably healthy, that two thirds of all who are born in it live to be married. Autumn is the moſt healthy, and ſummer the moſt ſickly ſeaſon there. The mortality of ſpring and ſummer, is to that of autumn and winter, as 115 to 100. In Mancheſter, diſeaſes are moſt frequent and fatal in the months of January, February, and March; and leaſt ſo in July, Auguſt, and September. The mortality of theſe two ſeaſons is as 11 to 8; and of the

the firſt ſix months of the year, compared with the laſt ſix months, as 7 to 6. M. Muret, Secretary to the Oeconomical Society at Bern, informs us, that he had the curioſity to examine the regiſter of mortality in one town, and to mark thoſe whoſe deaths might be imputed to intemperance. And he found the number ſo great, as to incline him to believe that drunkenneſs is more deſtructive to mankind than pleuriſies, fevers, or the moſt malignant diſtempers. *(a)* Such are the important uſes, to which Tables of Human Mortality have been applied.

The following plan of a more exact and comprehenſive regiſter, than has hitherto been kept, is ſubmitted to the conſideration and correction of thoſe who

(a) Vid. a very valuable Treatiſe on Reverſionary Payments, by the Rev. Dr. Price; the Bern Obſervations for the year 1766; Philoſophical Tranſactions, vol. 57 and 59; and Dr. Short's new Obſervations.

undertake the charge of the BILLS of MORTALITY in *Mancheſter*.

1. LET a table of *chriſtenings*, *marriages*, and *burials* be kept in every church, chapel, and place of religious worſhip in the town, and delivered at certain ſtated times, to the clerk of the pariſh church, to be formed into one general BILL, and quarterly or annually publiſhed. It is of importance that the *ſtill born* children, and thoſe who die before *baptiſm*, ſhould alſo be regiſtered; and the midwives ſhould be deſired to deliver an account of them. Perhaps the ſextons may aſſiſt in aſcertaining their number, as they are uſually interred in church yards, or other public burial grounds.

2. LET the table of *chriſtenings* ſpecify the *males* and *females* who are baptized; and the table of *deaths* expreſs the *males* who die, under the ſeveral denominations of

of children, batchelors, married men, and widowers; the *females* who die under the correſponding denominations of children, maidens, married women, and widows. An obſervance of theſe diſtinctions will determine the comparative number of *males* and *females* who are born; the difference between the ſexes in the expectation of life; and the proportion which the annual births, deaths, and marriages bear to each other. Thus by the BILLS of MORTALITY which have been kept at Vienna, Breſlaw, Dreſden, Leipſic, Ratiſbon, and other towns in Germany, it appears that the proportion of *males* to the *females* who are born is as 19 to 18: But the proportion of *boys* to *girls* who die under ten years of age, is as 7 to 6; and of *married men* to *married women* in Breſlaw as 5 to 3; in Dreſden as 4 to 1. At Vevey, in Switzerland, for 20 years, ending in 1764, there died in the firſt month 135,

males to 89 *females*; and in the firſt year 225, to 162. The ſame accounts ſhew likewiſe that both at Vevey and Berlin, the *ſtill-born males* are to the *ſtill-born females* as 30 to 21. In the pariſh of Holy Croſs, Salop, an account was taken by the Vicar, A. D. 1760, of the number of *males* and *females* of the age of ſeventy and upwards: The latter amounted to *thirty-five*, the former only to *eight*. At Paris, and in Sweden, it has been obſerved, that *women* not only live longer than *men*, but that *married women* live longer than *ſingle women*. And in Switzerland it appears particularly, from the calculations of M. Muret, that of equal numbers of *ſingle* and *married* women, between the age of 15 and 25, more of the former died than of the latter, in the proportion of 2 to 1. *(b)*

3. LET the ages of the dead under *five*,

(b) Vid. Dr. Price's Obſervations on Reverſionary Payments.

five, be ſpecified by ſingle years; and afterwards, by periods of five or ten years.

4. LET the BILLS of MORTALITY contain not only a liſt of the diſeaſes of which all die, but alſo expreſs particularly, the number dying of each diſeaſe, in the ſeveral diviſions of life and different ſeaſons of the year. To accompliſh this it will be neceſſary for the Phyſicians of the town, to conſider the preſent liſt of diſtempers; to reject all ſynonymous and obſolete terms; and to give a ſhort and eaſy explanation of thoſe which are retained. And whenever a perſon dies, who has been attended by any of the faculty, the Phyſician, Surgeon, or Apothecary, ſhould be deſired to certify in writing the age, and diſtemper of the deceaſed.

THE following TABLES are conſtructed upon this PLAN; and if the ſcale be

enlarged, will ſerve for the *Church Regiſter*, as well as for quarterly or annual publication. It appears to be unneceſſary, and in many inſtances would be exceptionable, to inſert the names of the deceaſed: Their *denomination* and *diſeaſe* therefore, may be expreſſed, in the columns allotted to each, by dots or units, which are to be ſummed up at the end of every three months, and ſet down in figures.

THE LISTS of *Marriages* and *Chriſtenings* may be kept in the common method.

THE additional trouble which this more comprehenſive and accurate REGISTER will occaſion to the Clerks of the ſeveral churches, &c. may be compenſated by diſtributing amongſt them, at the diſcretion of any judicious clergyman, the money which ariſes from the ſale of the quarterly BILLS. If a hundred of

theſe

theſe be ſubſcribed for, or ſold at the price of one ſhilling each, the ſum of twenty pounds per annum will thus be raiſed, without impoſing any new burthens on the town. Every ſecond, third, fourth, or fifth year the bills may be collected into a volume, and publiſhed, under the direction of two or more Phyſicians, with obſervations on the ſtate of the weather, the prevalence of epidemic diſeaſes, their ſymptoms and method of cure, and the increaſe or decreaſe of population during that period. Such a work will afford the moſt important inſtruction to the public; and from the profits of it, a fund may be eſtabliſhed for the benefit of the Clerks, and the ſupport of the inſtitution.

N. B. It is obvious that the plan here propoſed is not local, and that it may be executed with equal facility and advantage in every town and pariſh in the

the kingdom.—BILLS of MORTALITY might be rendered more useful in a political view, by taking sometimes the number of houses and inhabitants, under and above particular ages, wherever such registers are established.

TABLE

I.

TABLE of DEATHS.

January, February, March.

Ages.	Males.	Females.	Ages.	Batchelors.	Married Men.	Widowers.	Maidens.	Married Women.	Widows.
1.			20.						
2.			25.						
3.			30.						
4.			35.						
5.			40.						
10.			45.						
15.			50.						
Total under 15.			60.						
			&c. &c.						

II.

TABLE of DISEASES.

January, February, March.

Diseases.	1.	2.	3.	4.	5.	10.	20.	30.	40.	50.	60.	70.	80.	90.	100.
Casualties.															
Apoplexy.															
Asthma.															
Cancer.															
Chincough.															
Cholic.															
Consumption.															
Convulsions.															
&c. &c.															

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THE END.

ERRATA.

In various places for *bæmorrhage* read *hæmorrhage*.

Page.	Line.	
13,	3,	for *are* read *is*.
33,	laſt,	for *indiſpoſed* read *not diſpoſed*.
43,	6,	for *beat up* read *beaten*.
46,	9,	for *draſt* read *draff*.
72,	9,	for *thirty* read *twenty*.
105,	2,	for *haſted* read *haſtened*.
116,	12,	for *minute* read *ſmall*.
125,	11,	for *beat* read *beaten*.
185,	9,	for *chorea ſ. vitæ* read *chorea S. Viti*.
224,	9,	for *tupilago* read *tuſſilago*.