An essay on the nerves, illustrating their efficient, formal, material, and final causes : to which is added an essay on foreign teas, in which their nature, preparation, manner of using, and effects are investigated, so as to demonstrate their pernicious consequences on the nerves and therefore on the health of the human body : with observations on mineral witers, coffee, chocolate ... interspersed with select illustrations from the most scientific and respectable authorities in the theory and practice of physic / by H. Smith.

AN

ESSAY

ON

THE NERVES,

ILLUSTRATING

THEIR EFFICIENT, FORMAL, MATERIAL, AND FINAL CAUSES;

With a Copper-Plate,

DESCRIPTIVE

Of their Anatomy, and a Plate of Figures displaying the Manner of the Liquids being corrupted by corrosive Acids and stagnated by obtuse Alkalies.

TO WHICH IS ADDED

AN ESSAY

ON

FOREIGN TEAS;

IN WHICH

Their Nature, Preparation, Manner of Using, and Effects, are investigated, so as to demonstrate their pernicious Consequences on the Nerves, and, therefore, on the Health of the Human Body.

WITH OBSERVATIONS

On Mineral Waters, Coffee, Chocolate, &c. and the Author's Remarks arising from his Analysis of such Preparations as may be most beneficially substituted for India Tea.

THE WHOLE

Being designed to enable all Persons in Health or Disease, to instruct Themselves in the first Principles of knowing systematically the Construction of their Bodies, with the Causes and Cures of most Disorders incident to Nervous Affections.

INTERSPERSED

With select Illustrations from the most scientific and respectable Authorities in the Theory and Practice of Physic.

BY

H. SMITH, M. D.

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PREFACE

TO THE

ESSAY ON THE NERVES.

HAVING publiſhed ſeveral chymical and medical treatiſes that have been honoured with the favourable opinion of the Public, I have been induced to reſume my pen on a ſubject which is of the moſt intereſting nature to the community at large. There being no matter on which the happineſs of mankind more depends than on the uninterrupted enjoyment of health, to enquire into what is that ſyſtem which either preſerves or deſtroys the conſtitution, ſuggeſted itſelf as that which muſt claim the moſt general attention. Enquiries may be made into theories and practices, but none can be ſo immediately requiſite, or ſo likely to prove uſeful, as that which relates to the firſt cauſes of health and diſeaſe. Having examined every hypotheſis relating to phyſic and the conſtitution of man, none appears ſo eſſentially deſerving notice as the ſyſtem of the nerves. From every inveſtigation, I am convinced they poſſeſs the firſt principles of preſerving health or

incurring diſeaſe. In order, therefore, to trace in what manner the ſeeds of health or ſickneſs firſt produce their beneficial or injurious effects from the nerves, the following pages are impartially devoted. In this enquiry, the errors of former theoriſts are diſplayed, the real nature of the nerves aſcertained, their uſes developed, and their diſeaſes deſcribed. So that, from this brief inveſtigation, the reader will be able to trace the ſource of his own health or diſorder, and be enabled to apply the moſt effectual means of preſerving or reſtoring his conſtitution.

AN ENQUIRY

INTO

THE NERVOUS SYSTEM.

CHAP. I.

THE EXISTENCE AND NATURE OF THE ANIMAL SPIRITS.

TO convey a clear idea of the nerves, it is neceſſary to enquire into their final cauſe. From this will be aſcertained their nature, principle of operation, and by what they may be injured or preſerved. This knowledge obtained, will direct us in the diſcovery of what are nervous complaints, their origin, and their remedies.

The many that have written upon this ſubject have chiefly diſputed on their principle of moving the muſcles of the human frame by mechanical contraction and dilatation, denying their being tubular, and, thus, diſputing the poſſibility of their being the canals of animal ſpirits. Others, on the contrary, have contended that they were not ſolid fibres, but were tubes which conveyed the animal ſpirits into the muſcles, and thus dilated or contracted them. Each of theſe ſeemed to have attained a part, and not the whole truth of the nervous principle. From this error, thoſe who denied the nerves being the canals of the animal ſpirits, led to the miſtake of diſbelieving that vital power on

which, not only the health,—and diſeaſe,—but even the exiſtence of human nature immediately depends. And thoſe who have contended that the nerves were the vehicles of the animal ſpirits, which ſerved to dilate or contract the muſcles, deſtroyed that mechanical energy of the nerves themſelves, from whence all muſcular motion originates. That the nerves poſſeſs alone the power of moving the muſcles has been demonſtrated by ſeveral experiments that have been made by Galvani, Euſebius Valli, and others, on animal electricity.† From the many ingenious trials that the latter made upon ſeveral frogs, he conſtantly obſerved that when there remained the leaſt irritability in their limbs, he found they were capable of being moved in proportion to the communication made between the coating and the nerve. From this he not only juſtly concluded that the nerves had the power of affording muſcular motion — but that it alſo continued longer in their extremities than in their origin.

From ligatures upon the brachial plexus and tying the phrenic nerve of ſeveral animals, he found, from electrifying them in this ſtate, that when the nerves are tied, the electrical fluid, meeting with a better conductor, leaves its uſual courſe. But, that it always follows the channels of the nerves when it has no other courſe to take. When the electric fluid is weakened, either it is inactive or elſe has not ſufficient energy to irritate the muſcular fibre.* Theſe are adduced as inconteſtible evidences of the nerves moving the muſcles, and their debility being chiefly cauſed by the electric fluid being, by ſome means, weakened or exhauſted.

Having, thus, ſtated in what the advocates for each ſyſtem appear to have erred, the following arguments will be offered to ſhew that the nerves are the canals of the animal ſpirits, and that they dilate or contract the

† See Euſebius Valli's Experiments on Animal Electricity, p. 37.

* Valli's Animal Electricity, p. 59.

the muſcles of the human frame by their own poſitive energy, and not by the medium of pouring or withholding the animal ſpirits.

The nerves being here aſſerted to be the conveyance of animal ſpirits, throughout the human ſyſtem, it may be proper to define what is underſtood by this extraordinary liquid.

The animal ſpirits are defined to be a very thin liquid, diſtilled from the blood in the outward and cortical ſubſtance of the brain. From thence it is conveyed through the medullar ſubſtance of the brain, the corpus calloſum and medula oblongata, to the nerves, and from thence to the muſcles and every other part of the human frame. By the elaſticity and rarity of this univerſal fluid, all the liquids of the body are kept in one motion. This liquor being ſo ſubtile, as not to be perceptible to ſight, has cauſed ſome anatomiſts to conſider it a wind. But as wind is nothing but air in motion, and air being capable of condenſation, ſo as to change from a dry into a moiſt fluid, the animal ſpirits may be the latter ſpecies — but in the greateſt degree of rarefaction in which it can retain its moiſture. As it eſcapes the obſervation of ſight even aſſiſted by the beſt microſcopes, it muſt be the moſt ſubtile of all moiſt fluids. From this extreme ſmallneſs of its particles, it ſeems intended to penetrate the minuteſt pores of the leaſt fibres, as well as to fill the veſſels of the largeſt muſcles. Thus it may be ſaid to fill and vivify every part of the human body. And as it appears that it is the univerſal pervading principle of all our frame, whatever diſorders the canals by which it is conveyed, muſt proportionably diſorder and debilitate the whole conſtitution. From thence it appears how eſſentially and immediately the firſt principles of health depend on the nerves being preſerved in their natural vigour. Although Harvey has joïned moſt of the European Phyſicians againſt the opinion of Gliſſon, Wharton,

and

and Willis, and the College at Paris, who contended that the animal ſpirits were conveyed by a nervous fluid *a ſuccus nutritius e ſanguine ſuppeditatus*, ſupplied by the blood, yet the recent experiments in animal electricity of Galbani and Valli are greatly in favour of the motion and vitality of the animal ſpirits being dependent on ſuch a principle. The extreme delicacy of the pulp of the nerves being well adapted to conduct this electric fluid, all the animal functions as well as the ſpirits may derive their powers from this medium. The greateſt care ſhould be therefore taken to avoid whatever may tend to diminiſh, embarraſs, or counteract the efficiency of this energic principle. That narcotics tend greatly to diminiſh the vigour of this vivifying fluid, the application of opium to the animals on which the experiments were made by theſe phyſicians, ſufficiently demonſtrates. Valli found that opium although it did hot immediately deſtroy vitality, it in about five minutes deprived the nerve it inveloped of its faculty of conducting the electric fluid. And further, that it "almoſt conſtantly accelerated "the death of thoſe parts on which it has been al-"lowed to exert its influence for a longer time; as "for a quarter of an hour, twenty or thirty minutes." But for the abſolute deſtruction of vitality in the limbs of the animals on which he operated, that half an hour and ſometimes a longer time he found was required. The experiment that he made on a dog, previouſly killed by arſenic, deſerves particular notice. As he could not perceive that the poiſon had weakened his electricity or vital power*, might not the animal functions have been only ſuſpended? And might he not have been recovered by ſuch means as are now ſo ſucceſsfully uſed to reſtore animation? This appears a ſubject well worthy the conſideration of phyſical profeſſors. For it is very probable that many who ſeemingly die by convulſions might, by timely aſſiſtance,

* Animal Electricity, p. 86.

ance, be recovered. It is alſo neceſſary to notice that even arſenic is not found to deſtroy electricity or vital power, although they are both extinguiſhed in the animal by opium. But with reſpect to the reſtoration of life in many caſes where the animal is apparently dead, hiſtory affords many inſtances. And even the experiments of Doctor Valli himſelf upon ſome fowls which he plunged in water, until they were thought to have been entirely dead, and afterwards reſtoring them to life by electricity, proves the poſſibility of re-animation in many inſtances that are now too fatally neglected. Electricity may be found a great aſſiſtant in the practice of that laudable inſtitution, the Humane Society. As the preſervation of life is the chief deſign of this Eſſay, the above particulars are here moſt anxiouſly offered to the attention of thoſe whoſe immediate concern it is to relieve and preſerve human nature.

In anſwer to thoſe who deny the exiſtence of the nervous fluid, it is neceſſary to ſtate the evidence of the nerves containing animal ſpirits. If a nerve is cut or tied by a thread, the muſcle, which receives branches from it, becomes flaccid and incapable of having its fibres filled by any other means. It is, therefore, a demonſtration that the nerves muſt contain ſuch a liquid as gives every muſcle its due ſubſtance. That there is ſuch a ſpirit in the human frame is not only evincible—but its nature is clearly aſcertained by chymical demonſtration. Although nothing of this liquor can be gathered to examine its nature by mixing it with acids and alkalies, yet volatile alkalies, ſuch as ſpirits of hartſhorn, &c. being found to cheer the mind, proves that whatever is thus conveyed to the brain by the nerves, muſt be that which is encreaſed. And from its acting ſo congenially with what the nerves contain, it appears theſe animal ſpirits poſſeſs a volatile alkali. And as volatile ſulphurs encreaſe, likewiſe, that principle which cheers the mind

mind, whatever the nerves contain, muſt be of a volatile ſulphurous as well as a volatile alkaline nature. From this it is found that whatever cheers or encreaſes our ſpirits, braces the nerves by their fibres being filled by an acceſſion of their animal fluid.

There is nothing in nature bears a greater ſimilitude to the animal ſpirits than vinous or ardent ſpirits. This is obſerved by *Malbranche*, in his *De inquirend. verit.* where he ſays, *Vinum eſt adeo ſpirituoſum, ut ad ſpirituum animalium naturam quam proximè accedat.* i.e. Wine is ſo ſpirituous as to approach very near the nature of animal ſpirits. And *Friend*, obſerves in his Emmenolog. *Sp. Vini eas in ſe continet particulas, quæ in ſpiritus animales facilè migrare poſſunt.* Spirit of wine contains in itſelf ſuch particles as can eaſily change into animal ſpirits. This appears evident from the immediate effect ſpirituous liquors have upon the nerves, by diſtending them from an encreaſe of their fluid, which Doctor Knight acknowledges, " is a very " great reaſon of the near cognation between the " fluids. And moreover," he ſays, " dephlegmated " ſpirit of human blood, (which is an urinous one) " being ſhaken with the ſame quantity of ſpirit of " wine, it will permanently unite, notwithſtanding " that theſe two liquors do belong even to different " kingdoms, the one to the animal, the other to the " vegetable."

And as all encreaſe of the ſame ſubſtance depends upon an acceſſion of ſimilar particles to each other, the ſimilitude of wine and its ſpirit to animal ſpirits, is evident, from the former augmenting the latter, without altering their nature. For although an ardent ſpirit, like that of wine, cannot be obtained from human blood, yet Mr. Boyle has proved it to be a very inflammatory body. Phoſphorus being only ſulphur and ſalt in a coagulum, and both being the product of urine, ſhews that the combuſtible matter muſt have been originally in the blood, from which the animal

ſpirits

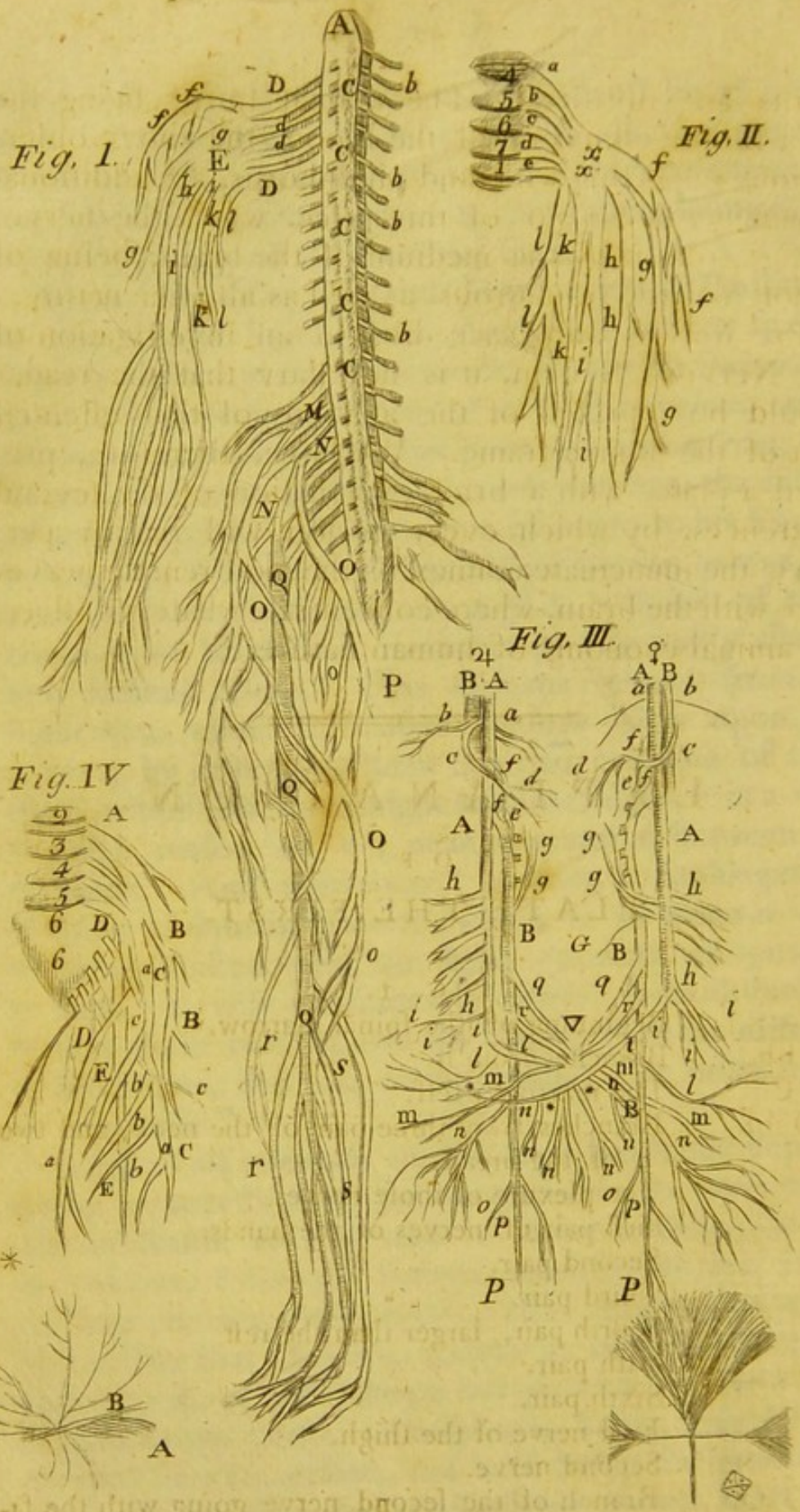
Fig. I.
Fig. II.
Fig. III.
Fig. IV

ſpirits are diſtilled. The animal ſpirits being the moſt ſubtile effluvium of the blood, the above obſervations reſpecting wine and phoſphorus, are additional arguments in favour of this juice, which the nerves extract from it by the medium of the brain, being of a moſt volatile ſulphurous, as well as alkaline nature.

Previous to our proceeding in an inveſtigation of the Nervous Syſtem, it is neceſſary that the reader ſhould be apprized of the anatomy of that eſſential part of the human frame. We have, therefore, prefixed a plate, with a brief explanation of the ſeveral references, by which every perſon will readily perceive the immediate connexion the moſt remote nerves have with the brain, where concentrate whatever affects the animal economy of human nature.

EXPLANATION

OF

PLATE THE FIRST.

FIG. 1.

A,	Beginning of the ſpinal marrow.
bb, bb.	Branches from it.
CCC.	The marrow itſelf.
DD dd.	Branches from three pair of the neck, and two of the breaſt.
E.	The plexure of thoſe nerves.
ff.	Firſt pair of nerves of the hands.
gg.	Second pair.
hh.	Third pair.
ii.	Fourth pair, larger than the reſt.
kk,	Fifth pair.
ll.	Sixth pair.
M.	Firſt nerve of the thigh.
N.	Second nerve.
O, O, O.	Branch of the ſecond nerve going with the ſaphena.
P.	Third nerve of the thigh.

Q, Q, Q, Fourth

Q, Q, Q.	Fourth nerve, thicker than all the reſt.
r r.	Ramus externus.
s s.	Ramus internus.

FIG. 2.

4567.	Four vertebræ of the neck.
1.	Firſt vertebræ of the breaſt.
a, b, c, d, e.	Five nerves from the holes of the vertebræ.
x x.	The plexure of the nerves.
f f.	Firſt pair of the nerves.
g g.	Second pair.
h h.	Third pair.
i i.	Fourth pair.
k k.	Fifth
l l.	Sixth pair ſub cutaneous.

FIG. 3.

Per Vagum Nervorum, or nerves of the ſixth, but here conſidered as the ninth conjugation.

♃.	The right ſide of the pair.
♀.	The left ſide of the pair.
A A.	External and greater branch.
B, B, B, B.	Internal or coſtal branch.
a a.	Branches carried to the neck.
b b.	Ramus externus.
c c.	Nerve of the tenth pair joined to the ninth.
d d.	A remarkable branch ſpread into the muſcle of the os hyoides.
e e.	Branches ſpread into the tongue.
f f.	Smaller branches from the external branch going to the larinx.
g g g g.	Right and left recurrent nerves.
h h h h.	Branches going to the lungs and aſperia arteria.
i, i, i i.	Stomach branches ſpread out.
l l l l.	Branches going to the caul, duodenum, liver, ſpleen, and colon.
m, m m m.	Branches going to the right and left kidney.
n n n n.	Branches going to the meſentery and guts.
o o.	Branches going to the os.
p p p p.	Extremities of the internal branches going to the womb and bladder.
q q, r r.	Branches from the internal bough making the plexure.

G. Nerve from the left recurrent diſtributed to the pericardium and heart.

* * *. Nerve, from the left ſtomach nerve, going to the liver.

Fig. 4.

CRURAL NERVES, explained.

2, 3, 4, 5. Four vertebræ of the loins.

6, 6. Os ſacrum.

A. Pair of nerves pertaining to the tranſverſe muſcles of the abdomen.

B B. Firſt pair of nerves of the foot.

C C. Second pair.

D D. Third pair.

E E. Fourth pair.

a a. Branch of the ſecond pair.

b b. Another branch of the ſame.

c c. Branch of the fourth pair going to the ſkin of of the thigh.

△. The nervous plexure of the meſenterium.

Explanation of Plate I. continued.

⊕. Part of the pulmonick nerve viewed with a microſcope, to ſhew its branchings on the lobules of the lungs.

* A. The nerve of the fifth pair with its branches: the upper of which tend to the muſcles of the eye, face, noſe, palate, and the upper of the mouth. It has beſide two other branches, making two of the roots of the intercoſtal nerve. The other lower branch of the fifth pair tends downwards, and is diſperſed into the lower jaw bone, and all its parts.

B. The nerves of the ſixth pair tending ſtrait downwards into the muſcles of the eye. But of this trunk, there is a branch forming the third root of the intercoſtal nerve.

CHAP.

CHAP. II.

NATURE AND USE OF THE NERVES.

HAVING ſhewn the exiſtence and nature of animal ſpirits, the nervous ſyſtem can be more eaſily elucidated. It appearing that the nerves are tubuli, and vehicles of a volatile liquid that pervades more or leſs every part of the body, they are found to be of the greateſt importance in all that relates to the health of human nature. But, although it is here diſcovered that they are the canals of the animal ſpirits, yet they have two other uſes. The one is to move the muſcles and the other to convey ſenſations to the brain. The nerves are, conſequently, not only the means of communicating the animating principle of exiſtence to every part of the body, but the medium by which the frame derives its internal and external motion, with all the ſeparate enjoyments of ſeeing, taſting, hearing, ſmelling, and feeling.

The nerves being the channels of ſuch a ſubtile fluid as the animal ſpirits, and theſe being conveyed from the brain to every fibre of the body, they muſt graduate into an infinity of number and ſmallneſs. So that, beſide thoſe which are ſo large as to be traced in their progreſs from their two ſources — the ſkull and the vertebræ, they muſt have numberleſs and almoſt imperceptible ramifications. Theſe have been found ſo ſmall and in ſuch quantities as to cauſe ſome anatomiſts to conſider every pore in the ſkin—but the orifice of a nerve. Although this is encreaſing the number to that of every pore internal and external of the body, yet, without admitting it to be literally true, it may be received as a proper figure of ſpeech to illuſtrate their amazing quantity and minuteneſs. But to prove

that

that the pores of the ſkin are not the orifices of nervous tubuli, it is only neceſſary to obſerve if they were, the mind would be in a ſtate of excruciating torture from the pain the nerves would convey to the brain, from their being immediately touched by every thing with which the cutis, or ſkin, is in perpetual contact. The nerves are, however, innumberably diſperſed on the dermis, or that part immediatly covered by the epidermis or outward ſkin, which is the defence nature has bountifully provided againſt their being liable to perpetual irritation. From their being the medium of feeling as well as the other ſenſes, wherever the ſkin is loſt the ſevereſt ſenſation of pain is immediately felt on the part being touched. That the nerves almoſt cover, by their infinite foldings, all the body underneath the epidermis or ſcarf ſkin, is evinced by the pain cauſed by ſo ſmall a part being touched as the point of a needle. If, when the ſkin is pierced, a nerve was not touched, the mind would not experience the leaſt ſenſe of pain. And as it is impoſſible to wound any part of the body with the leaſt point imaginable, without the brain feeling a tormenting ſenſation, it is evident that what is covered by the ſkin has ſcarcely a part free from a nervous fibre. To this is owing that feeling which the minuteſt parts of the body experience when in contact with cold or hot, moiſt or dry, hard or ſoft, rough or ſmooth. And ſuch is their extreme ſenſibility, that, although they are covered by the ſkin, yet they convey ſuch a difference of ſenſation to the brain as to enable the mind to judge of whatever touches the epidermis, without being immediately in contact themſelves. From this the mind acquires all the intelligence that it derives from externals affecting the ſenſes. Without this means of conveying information, the mind could never have had the leaſt idea of any thing. Day and night, ſummer and winter, heat and cold, beauty and deformity, and all that the world now preſents to man

by

by the communication of the optic, auditory, olfactory nerves, and thoſe of taſting and feeling would have been unknown. And as Locke has clearly proved that all ideas originate in the ſenſes, the nerves muſt be the ſource of intellectual as well as ſenſual knowledge. From what is above obſerved, the nature of the nerves is that of being, in their greater parts, capable of moving the muſcles, and diviſible into the minuteſt fibrillæ. Their uſe appears to be the conveyance of motion to the muſcles, ſenſations to the brain, and animation to the whole economy of human nature. The manner in which the nerves convey motion to the muſcles is by imitating their oſcillatory power which cauſes them to contract towards the middle, and, thus, ſhorten their extenſion and encreaſe their thickneſs and hardneſs. This motion being alternate, is ſo great, Valli obſerves, as to elude all calculation. And this alternate oſcillation ceaſes not until it has performed a ſeries of contractions and relaxations. The fibre, then recovering its tone, is reſtored to its former length, laxity, and ſmoothneſs. The muſcles, themſelves become thicker and rougher in proportion as theſe effects are produced by the irritation of the fibres.

Although Monro obſerves that the nerves derive their energy and principle of life independently of the brain, yet all our ſenſations prove that, if the brain be admitted as the general ſenſorium, it is a paſſive—if not an active principle, by which we obtain all knowledge of external and internal impulſes.

Admitting that the great quantity of blood which goes to the brain is not deſtined for the general ſecretion of the nervous fluid, but for the purpoſe of furniſhing materials to preſerve ſo large a maſs as the brain, yet we cannot but think with Dr. Valli, that the blood veſſels have moſt probably another office. And that this office is that of ſeparating the electric fluid in the brain, which is to be underſtood not only

what

what is in the cranium, but alſo what the medulla ſpinalis or nerves contain.

As a confirmation of what we have ſtated reſpecting the reciprocal connexion between the brain and the nerves being the great cauſe of all our ſenſitive and intellectual knowledge, we ſtate the following particulars from the above author:

He obſerves that the air in particular ought, at leaſt in animals, to have an abundance of the electric fluid; for this gives efficiency to genius, and it exerciſes its influence in different parts of the body. A want of this fluid ought to diminiſh in man his ſtrength, acuteneſs, and activity. In ſuch individuals as abound with it, he juſtly obſerves, that the imagination is fertile, its images happy and beautiful, and that ſuch are exquiſite painters of characters, paſſions, and of nature. Children who abound with this fire, diſcover and mimic the ridiculous in perſon or behaviour. Thoſe people who have the moſt vivacity (and this vivacity, cœteris paribus, proceeds from the nervous fluid) are particularly good mimics. Campanella knowing how to aſſume the countenance, manner, and geſtures of the people whom he intended to examine, was enabled to enter into their thoughts and inclinations as effectually as if he had been changed into the very perſon he examined.

When the ſecretions of this electric matter in the brain are by any cauſe augmented, the whole animal functions are more prompt and energetic; ſometimes they are even very violent. Similar to our obſervation of the affinity of wine to the animal ſpirits, which are encreaſed by this beverage moderately taken, this Phyſician obſerves, wine animates the phlegmatic and indolent. He alſo adds, that ſhocks invigorate them, gives them wit and humour, and inſpires them with raillery and repartee.

The following inſtances, judiciouſly ſelected by him from different profeſſors, are, from their curious na-

ture and illuſtration of the power of the nerves over the ſenſes, deſerving particular attention.

In the work of an Engliſh author*, he ſays there is a hiſtory of a perſon, by receiving a blow upon the head, acquired a degree of underſtanding he never before poſſeſſed. But what is more remarkable, that his new attainment left him as ſoon as he recovered.

Hyſterical women have, in ſome of their nervous attacks, ſpoken languages they could not ſpeak when in health†. Maniacs and hypochondriacs, and all thoſe whoſe brain may be ſaid to be in a ſtate of orgaſm, are moſt capable of extraordinary bodily exertions, and enduring cold, hunger, fatigue, and watching. Some of thoſe have periodical attacks, which ſeem to ariſe from an encreaſe of electricity in the brain. He was informed by Dr. Simmons, who has been in the habit of treating people of deranged underſtanding, that he has obſerved that, after they have been for ſome time in a ſtate of tranquility, they, without any obvious cauſe, became uneaſy, reſtleſs, and quarrelſome, and were ſeized with paroxyſms of rage and anger.

This tumult ſubſiding, by degrees, they reſumed their former tranquility. Thus, after the horrors of the tempeſt, the air becomes calm and the ſky recovers its ſerenity. On the ſubject the Doctor obſerves, that there is not any inſtant in life in which the brain ceaſes to act. He, therefore, concludes that the electricity by which it acts, ought to exiſt conſtantly in the brain, although not in perfect equilibrium—but, as the Italians more emphatically expreſs it, in *ſbilancio*. He further ſuppoſes that it exiſts, likewiſe, in the ſame manner in the ſpinal marrow and nerves, with the difference that, except under certain circumſtances, it is not excited in ſome of the nerves. Without dwelling further upon this theory, he contents himſelf with obſerving that the brain, ſpinal marrow, and nerves, have a ſpecific conſtitution,

* Robinſon on the Spleen. † Tiſſot, Maladies des Nerves.

ſtitution, on which alone the mode of electricity in each of them depends. Although the principle moſt certainly exiſts, yet we perfectly agree with this ingenious author, that no reaſoning or experiment can ever explain the cauſe of the fluid not maintaining an equilibrium, or of its being found in a ſtate for conſtant action, or for acting only under certain circumſtances.

CHAP. III.

OFFICES OF THE GREATER NERVES.

A Nerve is a long and ſmall bundle of very fine tubes or hollow fibres. The medullary ſubſtance of the brain is the beginning of all the nerves, and, it is probable, each fibre of the nerve correſponds with a particular part of the brain at one end, and a particular part of the body at the other end. By this means, whenever an impreſſion is made upon ſuch a part of the brain, the ſoul knows the part of the body which is affected.

The nerves accompany the arteries through all the body—but not, as ſome imagine, to keep the animal ſpirits warm by the continual heat and pulſe of the arteries. For the nervous juice we have found to be of ſuch a ſulphurous nature as to poſſeſs ſufficient warmth in itſelf. It rather ſeems that the nerves accompanying the arteries, is deſigned by nature to contribute, by the heat of the animal ſpirits, that motion to the blood in the arteries which may be the firſt means of its incalation. The nerves have alſo blood veſſels as well as the other parts of the body. Theſe veſſels are not only ſpread upon their coats, but they

 run

I do not know what you mean; neither, do I think that you know it yourself!!! You appear like a man ſpeaking in ſleep.

run alſo among their medullary fibres, as may be ſeen amongſt the fibres of the retina.

Our opinion reſpecting the nerves not receiving their animating principle from their attendance on the arteries, is ſtill more confirmed by the electrical experiments to which we have before alluded. From the evidence adduced by Dr. Valli, of the exiſtence of the electric fluid in the nerves, their can be no neceſſity to reſort to the arteries for their vivifying energy. Such is the heat and animating nature of the fluid derived from electricity, that it may not be preſuming to conſider it as the univerſal principle of life and motion in all ſublunary beings. For, according to our author, if magnetiſm be an effect of electricity, is it not a further proof that the latter is capable of producing phenomena in bodies according to their quality and ſtructure? But in order to prove more forcibly the identity of the electric principle in animals, he conſiders as follows, their mode of ſenſations:

"Let us imagine ourſelves, ſays he, placed upon the ſummit of a lofty mountain, which commands the proſpect of an immenſe plain, preſenting us with a world at one view. A thouſand different objects preſent themſelves at the ſame moment, and a thouſand different impreſſions are in the ſame inſtant made upon the brain, although we have not diſtinct ideas of all of them. A man who has an ear for muſic, hears a variety of tones and voices at the ſame inſtant, yet can detect the leaſt error in the meaſure of time, or in the accord of ſound."*

He then aſks, by what medium the impreſſions made upon the retina and upon the membrana tympani, are extended to the brain? And how all the other impreſſions on the nerves are communicated to the ſenſorium? He anſwers, that Newton, to ſolve this problem, had recourſe to the oſcillations of æther, which, according to this great philoſopher, was the cauſe of

* Animal Electricity, p. 243.

of all the motions in the univerſe. But Dr. Valli obſerves, that as this æther is not generally known, and as electricity explains theſe phenomena ſufficiently, he ſubſtitutes the laſt mentioned agent for the æther of Newton. However, as this is a ſubject of the firſt importance in the ſyſtem of the nerves, we ſhall tranſcribe the paſſages from the great philoſopher, on the ſubject of viſual and auditory ſenſation, from the ſecond edition of his Optics, page 328.—"Is not viſion performed by the vibrations of this medium, excited in the bottom of the eye by the rays of light, and propagated through the ſolid, pellucid, and uniform capillamenta of the optic nerves, to the place of ſenſation? And is not hearing performed by the vibrations either of this or ſome other medium, excited in the auditory nerves by the tremors of the air, and propagated through the ſolid, pellucid, and uniform capillamenta of thoſe nerves into the place of ſenſation? And ſo of the other ſenſes."

"Is not animal motion performed by the vibration of this medium, excited in the brain, by the power of the will, and propagated from thence through the ſolid, pellucid, and uniform capillamenta of the nerves into the muſcles for contracting them? I ſuppoſe that the capillamenta of the nerves are each of them ſolid and uniform, that the vibrating motion of the *ætherial medium* may be propagated along them from one to the other uniformly, and without interruption."

Although we have, in the beginning of this Eſſay, ſtated our objection to the opinion of Sir Iſaac Newton, Veſſalius, Aquapendente, and Leevenhoek, who deny the cavity of the nerves, yet it appears to us, that Sir Iſaac has, in the latter part of the above obſervations, deſcribed the operation of electricity—although he has not expreſſed definitely the principle. By ſuppoſing that the motion of the ætherial medium may be propagated along the capillamenta of the

nerves, he acknowledges the electric effect of the ſubtle effluvia paſſing along any conducting wires to its deſtined collector.

But Dr. Valli has more particularly explained the operation and principle in the following paſſage.

" Since the medullary ſubſtance of the brain is of a fibrous compoſition, the threads of which are diſpoſed in a parallel direction, as is particularly obvious even to the naked eye in the corpora ſtriata, the thalami of the optic nerves, eſpecially of fiſhes, in the fornix when immerſed in nitrous acid for ſome time; ſince there are nerves ſufficiently manifeſt, as in the ſeventh and fifth pair (V. Haller, Prim. Len. Phyſ. with notis Prof. Wriſberg.) we muſt conſider nerves as an aſſemblage of parallel fibres."

" Theſe threads or fibres are ſo many electrophori. The electricity of each is excited apart, and each apart impreſſes a ſtroke upon the brain, which is proportioned to the impulſion they receive, and to the excitement of their electrical matter. In this every one excites numberleſs diſtinct impreſſions.

Not only ſeveral impreſſions are made at the ſame time upon, but they are effected with a rapidity which belong uniquely to the electrical fluid. One may hear three or four ſounds in ſucceſſion, very diſtinctly, in the ſpace of a quarter of a ſecond. Between the time of touching a body, and the conſciouſneſs of ſuch a touching taking place, there is not any intermediate ſpace which can be calculated by the known meaſures of time. Notwithſtanding, it appears, that ſometimes this fluid does not poſſeſs its ordinary velocity; but even common electricity has ſometimes a loitering pace, not eaſily reconcileable, with its common immeaſurable velocity."*

Having deſcribed by a plate the anatomical ſituation of the principal nerves, it is unneceſſary to enter here into a particular detail of their ſituation.

We

* Valli's Animal Electricity, p. 245.

We ſhall, therefore, curiouſly remark their internal and external offices in the body.

In referring to the greater nerves, it is meant to enquire into the offices of thoſe which are viſibly the cauſe of moſt of the other animal functions, as well as muſcular motion.

The connexion which the nerves have with the muſcles, ſeems to be for the two purpoſes of conveying animal ſpirits to the blood contained in the veins and arteries of the ſaid muſcles, and to contract or dilate them by an active energy they poſſeſs by nature for the purpoſe.

The nerves ſupply the lymphatick veſſels with animal ſpirits, which are thus conveyed into the veins from every part of the body. This ſhews how eſſential to the firſt principles of life, is the perfect ſtate of the Nervous Syſtem. For, if they are injured, the veins muſt be deprived of that fluid which ſerves to animate, and, perhaps, is the firſt cauſe of their motion. Thus, the animal body is never better nouriſhed than when all its parts are full of circulating fluids. And the lympha being that which flows amongſt the fibres of the ſolid parts, and fills up their interſtices, it abundantly ſupplies the body with nouriſhment.

The great number of nerves which are about the upper orifice of the ſtomach, renders it extremely ſenſible, and cauſes that ſympathetic connexion which is between the ſtomach, heart, and head: this ſympathy is ſo great, as to have cauſed Van Helment to think that the ſoul had its ſeat in the upper orifice of the ſtomach.

Agreeably to this obſervation of the great ſympathy there is between the ſtomach, heart, and head, Dr. Valli juſtly ſtates, "that the paſſions in general render the ſenſes more delicate and exquiſite, and, in this ſituation, the ſlighteſt cauſes may diſconcert both the phyſical and moral parts." He further obſerves,

"that

" that irritation of certain parts of the body do the ſame, particularly of thoſe organs endued with much ſenſibility, and which ſympathize with the reſt of the ſyſtem as the ſtomach and uterus."

As inſtances of the above ſympathetic effects upon the nerves by the diſeaſe of the ſtomach, he ſtates with regard to himſelf. When he experiences an indigeſtion, the mereſt trifles give him uneaſineſs, and, the mind being equally irritable, he becomes fretful, petulant, uncivil, and intolerable. He thinks, therefore, that the demon which afflicted Saul, was probably a bad ſtate of the ſtomach. A prince, a general, a judge, a phyſician, he ſays, are very redoubtable and dangerous beings in the moment of indigeſtion.

The plexus nervoſus of the hypochondria and meſenterium, convey ſeveral branches to the bottom of the ſtomach, which is therefore affected in all hyſteric and hypochondriacal complaints. This accounts for the indigeſtion which generally attends all nervous affections.

From the filaments of the nerves entering obliquely into the œſaphagus, the periſtaltick motion is effected that cauſes our food to be conveyed into the ſtomach. It is, therefore, when the nerves are affected by irritation or debility, diſagreeable ſenſations are perceived in the throat. And were it not for the periſtaltick motion, our food would be liable to ſtop the paſſage of the œſaphagus.

The two nerves which enter into the liver, where they form with the arteries innumerable branches throughout the whole ſubſtance of the liver, ſeem to be for the purpoſe of conveying the animal ſpirits, ſo as to promote the ſecretions of the bile. And as they form a net which enfolds the arteries, the ſulphurous warmth of the animal ſpirits muſt aid the incalation of the blood. If, therefore, the nerves are debilitated, the liver muſt be deprived of ſufficient energy, to ſeparate the bile from the blood. Thus is

per-

perceived the cauſe of all thoſe bilious complaints, which are more or leſs attendant on nervous diſeaſes. And here it may be obſerved, that the elements of the bile, conſiſting of much fixed alkali, and phlegm, beſide a like volatile alkali, ſuphur and earth, its uſe is to perfect the chyle. For as alkalies diſſolve ſulphurs, and phlegm is diluting, the ſulphurs of the chyle are diſſolved by the alkalies, and its whole ſubſtance diluted by the phlegm of the bile. Thus is the chyle preſerved from coagulation, and rendered ſo liquid by the aid alſo of a fluid, called the pancreatick juice, as to be capable of paſſing into the ſmall veſſels, called the lacteal veins. This is an additional evidence of what remote diſeaſes, the debility of the nerves may occaſion. From the chyle not being properly prepared, the body is deprived of its principal nouriſhment, and is, therefore, liable to all thoſe complaints which end in all kinds of waſtings and conſumptions.

Many nerves which ariſe from the vertebræ of the loins, and from the intercoſtal, are ſo interwoven one with another upon the meſentery,* as to form a plexus, called the meſenterick plexus. Many nervous fibres branch from this, and ſpread amongſt the fibres of the membranes of the meſentery. The uſe of theſe nerves is to convey abundance of animal ſpirits to the chyle, which fills the numerous lacteals of the meſentery. Thus is the chyle rendered more ſubtle and fluid by the volatile alkali of the animal ſpirits. And if there be any acidity in the chyle, it is by the ſame alkalies corrected and changed into ſalts. This further evinces of what uſe the nerves are in the ſupport and nouriſhment of the human frame, and, therefore, the danger ariſing from their being diſordered.

The

* A membranous ruff to the circumference of which the inteſtines adhere.

The nerves which the heart receives from the plexus cardiacus, and the par vagum, aid conſiderably the paſſage of the blood. They appear to be the cauſe of the auricles being full of blood, when the ventricles are empty. The animal ſpirits being forced out of their fibres into the auricles, when they are full of blood, complete their contraction. As ſoon as the auricles are thus contracted, the blood advancing on all ſides, and joined with the ſpring of the nervous fibres, reſtores the auricles to their former ſtate. The animal ſpirits paſſing, at that moment, from the auricles to the heart, cauſes its contraction. In this manner, the auricles are empty when the ventricles are filled, and the ventricles are empty when the auricles are filled. The nerves being ſo neceſſary to effect the paſſage of the blood from the heart, proves what dangers may ariſe from ſudden ſpaſms of the nerves. To this may be owing the falling ſickneſs, palſies, apoplexies, and all deadly afflictions, ariſing from the nerves being ſuddenly ſuſpended in their office of contributing to the paſſage of the blood, from the ventricles to the arteries.

CHAP. IV.

OFFICES OF THE GREATER NERVES FURTHER CONSIDERED.

THE filaments of nerves which are obſerved to loſe themſelves in the veſicles of the lungs, ſeem to contribute by the energy of their animal ſpirits, to cauſe the power of reſpiration, or the ingreſs and egreſs of the air in our bodies. The veſſels being filled with the animal ſpirits, muſt cauſe the fibres of the

the lungs to contract, and thus preſs out the air, which has no ſooner left the lungs, than freſh air immediately fills the vacuity. For it is the principle of air to leave no vacuum. From the energy of the nerves greatly depends that free reſpiration, which is not only ſo eſſential to our health—but even to our exiſtence. The lungs being enabled, by the vigour and activity of the animal ſpirits, to contract themſelves ſo as to force out the air it has inſpired, is thus prepared to receive a freſh ſupply. As this vital principle is ſo indiſpenſable to our preſervation, a few further remarks, on its effects on the blood, may not be thought unintereſting.

There being found a great difference between the blood which enters the lungs and that which leaves it, proves that the air muſt impart to it ſome peculiar qualities, which may explain further benefits derived from it than merely the power of breathing.

That blood which enters by the pulmonary artery, is of a deep red, while that which returns from the lungs by the pulmonary vein, is of a light red. This may be derived from two cauſes, the one, from the nitrous particles of the air, and the other, from the alkalies contained in the animal ſpirits. The blood, therefore, in its paſſage through the lungs, is rendered more ſubtle, more agitated, and more rarified, and thus more proper for the reſt of the circulation. This muſt create that equal temperament of the blood, which conſtitutes the firſt means of health.

The preſſure of the air upon the blood veſſels muſt alſo operate conſiderably, to render it fit for nutrition and ſecretion. By this compreſſion, which has been found to equal that of 100lb. weight, the red globules of the blood, from their languid motion in the veins, being grown too large to circulate in the fine capillary veſſels, muſt be broken and divided again in the ſerum. This proves the great effect which the lungs produce on the blood by the preſſure, as well

as

as the nitrous particles of the air. But here it muſt be ſtated, that the air does not enter the blood veſſels in inſpiration; for it requires a conſiderable preſſure to force it through their pores. This is, therefore, effected in expiration, when the air preſſes the lungs; for if it went eaſily out again the way it came in, that neceſſary attrition of the blood could not be performed.

As nothing enters into the ſpleen but animal ſpirits from the nerves, and blood from the arteries, the uſe, if it has any, muſt be greatly dependent on the ſtate of the nervous ſyſtem. As there goes nothing but the lympha into the reſervatory of the chyle, and the blood from the ſplenical veins, and neither appearing to have any other quality than what they had before they entered the ſpleen, Anatomiſts have found it difficult to aſcertain its neceſſity in the body. For if the arteries bring blood to it, it appears only to nouriſh it; and if the nerves ſupply it with animal ſpirits, it can only be to give the nutritive juice the neceſſary fluidity. So that both ſeem merely employed to ſupply, in this inſtance, the ſpleen with nouriſhment. But, however, from what is to be obſerved in all the productions of nature, it cannot be deemed entirely uſeleſs. It is not probable that an uſeleſs part ſhould always be found of the ſame form, and in the ſame ſituation, in the body of a living creature. Nature would ſcarcely have been ſo uniformly exact in its place and conſtruction, had it not been for ſome purpoſe. It is, therefore, probable, it is of ſome eſſential ſervice in the animal economy. If it be, its effects muſt, in a great meaſure, depend on the perfect ſtate of the nerves, by which it is ſupplied with animal ſpirits. It may be ſuppoſed that a ferment diſtils from the veſicles of the glandules, and that it mingles with blood paſſing through the ſpleen. The nature of this ferment may be ſuch, as to ſeparate from the other parts, thoſe which are proper to

compoſe

compoſe the bile. The reaſon for this opinion is, from the blood going from the ſpleen, paſſing into the vena porta, and from thence to the liver, where it is known to depoſit thoſe parts which are proper to compoſe the bile.

From the diſeaſe of the ſpleen, by the debility of the nerves cauſing melancholy, the ancients thought it the receptacle of the melancholick humour. Others have thought, from its having a number of fibres, membranes, and many nerves, that the blood became more attenuated and ſpirituous in the ſpleen; and conſidering, that moſt of the blood in the liver comes immediately from the ſpleen and omentum, they thought, and, perhaps, with truth, that the one furniſhed the oleaginous, and the other the ſpirituous part of the bile. But, however, this may be, an animal living many years after taking out the ſpleen, cannot be admitted as a ſolid argument againſt its uſe. For the cutting out the pancreas, which has uſes that are known, and which are acknowledged to be moſt neceſſary for maintaining the animal economy, does not hinder a dog from living many years. So that, although its poſitive uſe cannot be aſcertained, yet there is no ſolid proof to be brought againſt its neceſſity in the human frame. And whatever is its office, the nerves, as above obſerved, are in this, as in every other animal function, eſſentially ſerviceable.

Without entering into a further enquiry into the uſes of the nerves in the animal economy, that would extend to a volume itſelf, our obſervations are neceſſarily confined to the above particulars, in order to adduce phyſical demonſtration of the nerves being the firſt cauſes of either health or diſeaſe.

CHAP.

CHAP. V.

PROPERTIES OF THE NERVES.

IN the ſmalleſt veſſels, the proportion of ſolid to the fluid it contains, encreaſes as the veſſels become finer—which is the cauſe of the exterior parts being more ſolid, from conſiſting of more and finer veſſels.

The power of a laſt ſolid on the contained fluid, is only an endeavour to contract itſelf, which is the efficient cauſe of promoting the motion of the fluid. For the more the ſolid is prolonged, the more its diameter muſt be contracted, and thus muſt the motion of the fluid be proportionably accelerated. For inſtance, let A G, and C H, Fig. 1, Plate II, be two parallel lines infinitely extended. From the points C to A, and D to B, erect two parallel perpendiculars. Then draw the lines C B, C E, C F, D E, and D F. It is manifeſt from Euclid,* that the parallelogram A B C D, is equal to that of C D E F; and that the triangle B C D, is equal to that of C D E, although the ſides of the parallelogram A B C D, and the ſides of the triangle B C D, are leſs than the ſides of the parallelogram C D E F, and the ſides of the triangle C D E. As this happens with cylinders and cones, which are the two forms of the veſſels of the body, it is manifeſt they muſt be more contracted the more they are prolonged. All the force, therefore, of the ſmalleſt ſolids on their fluids, depends on the force contracting thoſe veſſels or ſolids. The power of all the greater veſſels ariſes from the aggregated force of the ſmalleſt; for every nerve, vein, and artery has its force

* Book I. Prop. 35.

force from its ſides, which are compoſed of the ſmalleſt veſſels.

Thus all nutrition is made only in the ſmalleſt nervous veſſels, and not in the greater, as in the arteries, veins, glands, lymphatic, and adipoſe veſſels; for the augmentation of the greater entirely depends on the extenſion of the ſmalleſt lateral veſſels, which are nervous tubuli. Therefore nutrition, which is only the application of any part to the place of a waſted part is effected, in thoſe ſmalleſt canals of which the greater conſiſt. It follows, conſequently, as we may hereafter have occaſion to ſtate, that all medicines, whether deſtined to ſupply, evacuate, or alter, muſt be ſuch as are capable of entering into the ſmalleſt veſſels, where they can only act as the means of health or averting diſeaſe.

Every change in the fluids is made in the ſmalleſt veſſels, and is owing to the force of them, and the nature of the liquids themſelves. There is a force in all the ſides of flexible canals, by which the parts endeavour to approach each other, ſo as to become ſhorter than the line of direction appropriated to the fibre: and this force is found in the point of every fibre. This is ſtated to ſhew that the nerves do not derive their power of moving the muſcles by the medium of their animal ſpirits, but from a certain active energy they have in themſelves. This force, by which the parts endeavour to contract themſelves, is reſtrained by the points of the diſtending liquid. This power acts truly and phyſically, even at the time in which the fibre ſeems moſt at reſt: for example. Fig. 2. Let ⌒ be ſome fixed point, or nail in a wall, from which ſuſpend the weight D by the muſic ſtring B; hang to another ſtring fixed to the former, at the point D, another weight, paſſing over a pulley, fixed in the wall, as ⊕; the latter weight ſhould be hung ſo as the force of the former, ſhould exceed the latter, in order to prevent the bending of the

ſtring

ſtring C. Having placed theſe weights, cut with a very ſharp knife, the ſtring C, between the point C, and the weight, ſo as not to impreſs any motion on the ſtring. The upper part, A C of the ſtring, will immediately contract itſelf, ſo as to raiſe up a little, the other weight. It is manifeſt, therefore, that the ſtring, before the diviſion exerciſes its contractile power, although it is prevented from contracting itſelf by the weight hung to it, yet it is always in a ſtate of active energy. This power is the ſame in the nervous fibres of the body, which may be ſeen in a fibre cut tranſverſely; for it contracts itſelf towards its fixed points, and thus cauſes that gaping of all wounds made in the body.

That force, which any part of the body exerciſes to contract itſelf, is balanced by the antagoniſtic force; for all the parts having the contractile power, which, drawing towards oppoſite points, muſt balance each other. This balance depends upon the equal influx of the liquid, and its impulſe on all parts, ſo as to diſtend them equally. From this principle of the nerves, may be diſcovered that health chiefly depends on the regular motions of the ſolids, and that when this is diminiſhed, the animal functions become languid, nutrition is prevented, and all the frame falls into a rapid ſtate of decline. But when the motions of the nervous tubuli are too violent, fevers, deliriums, and even madneſs may be the conſequence.

It is evident, therefore, that the means of preſerving or reſtoring the conſtitution, muſt greatly depend on the temperate equilibrium of animal motion.

As whatever deſtroys the force of reſiſtance in the canals, muſt deſtroy it in the whole body; diſeaſe frequently enſues when the equilibrium of the oſcillatory motions are diminiſhed.

But to ſhew more clearly what principally alters this balance of the nervous motion, the following obſervations,

vations and examples reſpecting the effects of acrid or viſcid particles entering the ſmalleſt veſſels, are preſented.

The balance of this eſſential motion to health is never more deſtroyed than when ſome acrid has inſinuated itſelf with the liquids and ſticks in the ſides of the ſmall tubuli.

Microſcopes have diſcovered that acrids conſiſt of ſeveral points, forming edges like that of a knife or a ſword; this cauſes them to gnaw, prick, and cut, like ſo many little wedges in the ſmall points of reſiſtance.

Should an acrid be infixed in the ſide of any veſſel, the whole force of the liquid which uſed to act on the ſides, is now impelled to that point where the acrid is fixed, and cauſes a convulſion of that canal; it is thus demonſtrated:—In Fig. 3. A,B,C, is a portion of any veſſel in which the lines deſcribe the flowing of the liquid through the canal; the line from D impinges upon E, and that which is drawn from F impinges upon G; all theſe lines are ſuppoſed to repreſent liquids flowing, impelling, and diſtending, with equal force, the points on which they impinge; and as the canal is contractile, thoſe points contract themſelves equally ſo as to reſiſt the impulſe in ſuch a manner as to preſerve the oſcillatory motion. But if any acrid particle, as H.I, is fixed into the ſide at the point I, it cannot be moved from this point by the flowing in of the liquid, becauſe the preſſure from the part H,C, is equal to that from the part B,H. Thus, the fluid that is contained between B,H, will ruſh on the ſurface H,I, which will ſuſtain the whole force that ought to be ſuſtained by the whole length from I. to K. And all the force that is impreſſed on H,I, is communicated to the point I, which, as the canal is flexile, muſt give way from being more preſſed than the other points of the ſame ſide. And as the canal is alſo elaſtic, the more it is preſſed with the greater force it reſtores

itſelf, which, thus deſtroying the balance of the oſcillatory motion, cauſes convulſive motions in the veſſel. Bodies producing this effect, are chiefly volatile and fixed acrid ſalts, and the corroſive particles of metals*, which hurt from their figure being like the wedge H, I, and affecting the body more as ſolids than fluids.

From this it appears that the ſtiffer and leſs flexible the infixed particle is, and the deeper it is infixed, the more dangerous muſt be its effects. Particles of metals, therefore, reduced to an acute figure by corroſion, muſt produce the worſt of conſequences in the human body. The heavier the particle is, the more diſeaſe it muſt cauſe, from the greater difficulty of removing it. And whenever it happens that the influx of humours ceaſes, there alſo is loſt the whole force of medicines. For when even a cauſtic is applied to ſick perſons reduced to extremity, and almoſt expiring, it can ſcarcely act with the leaſt effect, from the circulation of the humours continuing only near the heart. But apply the ſame cauſtic to a ſound and vigorous body, it operates immediately. This is ſtated to ſhew the danger of not ſeeking ſpeedy remedies for all thoſe acrid diſtempers which obſtruct the motions of the liquids, and diſorder the tone of the ſolids.

Liquids paſſing in parallel lines through cylindrical as well as conical veſſels, the acrid particle has a milder effect in the former than in the latter. For the force of the liquid on the infixed particle at E, Fig. 4. if it be a little preſſed towards G, will paſs towards B D, where it will find a ſpace equal to the former A C. But it is different in the conical veſſels; for in Fig. 5, the fluid which runs from the part A D C, on the particle F, after paſſing between G and the ſaid particle, finding a leſs ſpace than that it left, is more violently preſſed in flowing towards B, than it was in the cylinder. Let us next ſuppoſe an inverſe motion of the liquids in Fig. 6, in the conical veſſel A B C D, which

* See the annexed Enquiry into the Nature of Foreign Teas.

which may be here conſidered as a vein. The liquor flowing from A B, impinges only in a few points on the particle F, and will impel it a little towards D, and will conſequently make it paſs from the ſpace between G and the particle being greater than A B, and the liquor not having ſo much reſiſtance on that ſide. The force, therefore, impreſſed on the particle by the fluid running in is, in this inſtance, ſcarcely any: acrids, therefore, are leſs injurious in the veins than the arteries; for they never act leſs on the ſolids than when they are applied to a cavity growing broader from a narrow beginning.

If any acrid adheres externally to the ſide of a veſſel, it produces the ſame effect as if it happened internally; for the point in Fig. 7, muſt neceſſarily be diſtended by the liquid flowing in, and equally preſſing the canal A B, and, therefore, it will preſs the adhering particle D, and ſtrive againſt it. But when, from the preſſure of the atmoſphere or any other cauſe, it cannot be removed, it muſt neceſſarily penetrate the ſide of the veſſel, and hinder the equal motion of the fluids. In this manner all plaiſters and ſtimulating medicines applied externally, act upon the human body. Thus it may be inferred, that the action of medicines conſiſts in removing impediments to the equal motion of the fluids.

By this poſition alone of one particle, all the reſt remaining in their natural ſtate, the ſecretions may be altered and diſturbed, the canals dilated, the concuſſive force of the ſides increaſed, and the oſcillatory motion deſtroyed.

Having thus exemplified the manner in which acrids act upon the ſolids of the arterial and veneal veſſels, we ſhall add an inſtance, ſhewing in what manner the viſcids operate.

A viſcid is that which tenaciouſly adheres to the ſide of a veſſel, without being able to penetrate or la-

cerate its ſurface, which alone diſtinguiſhes it from an acrid.

A viſcid may adhere two ways to the ſide of a veſſel; it either touches the ſides only in one part, as A, Fig. 8, or all around, as at H, *ibid.* The effects of this viſcid, in both inſtances, are explained in the ſaid figure. Let A D be a viſcid particle, ſo tenaciouſly adhering to the veſſel, as not to be moved by the liquid running in the lines E I and E F. It will, therefore, ſuſtain the whole force of the liquor that ſhould be ſuſtained by the part of the ſide between A H. The part of the ſide to which the particle adheres, will recede outward, until by a greater force it reſtores itſelf. This violent energy, deſtroying the balance of the oſcillatory motion, cauſes an obtuſe pain, which diſtinguiſhes all diſorders that ariſe from viſcid humours. Let us next ſuppoſe the viſcid particle touches the veſſel all around, as at H, in the ſame figure. With regard to the veſſel to which it adheres, it operates as a total obſtruction, and, at the ſame time, a diſtenſion of all the ſides of a veſſel. There being a balance effected between the liquids preſſing on each ſide of the viſcid, it remains unmoved, and therefore ſtops the cavity, which is the cauſe of the ſides of the veſſel being diſtended, and the circulation of the fluids impeded.

Having taking this view of the nerves, and the manner by which their regular motions are deſtroyed by acrid and viſcid humours, we beg leave to conclude this Treatiſe, by an Enquiry into the nature of Foreign Teas, by which our readers will be able to judge, whether they are or not the cauſe of thoſe innumerable complaints that are ranked under the title of nervous affections, to the great detriment of the health and happineſs of human nature.

ADVERTISEMENT

TO THE

FOREIGN TEAS.

HAVING, in the preceding enquiry, traced, from the ſyſtem of the nerves, that on their ſtate the health of the conſtitution chiefly depends, our immediate concern is next to aſcertain what kind of food, we either adopt from choice, cuſtom, or neceſſity, is the moſt likely to deſtroy the economy of the nerves. And as Foreign Teas have long been cenſured as being the immediate cauſe of the many diſorders which ariſe from the nerves being diſarranged or debilitated, an impartial enquiry is here made into the nature, preparation, and effects of theſe Teas. By this inveſtigation, it will appear that Teas imported from China and India are the moſt injurious of any beverage that can poſſibly be taken as a general and conſtant aliment. But not prematurely to anticipate any part of the following ſubject, the Reader is moſt reſpectfully referred to the following pages for further evidence.

INTRODUCTION.

AS two of the four meals that form our daily ſubſiſtence are chiefly compoſed of tea, an enquiry into what kind is the moſt ſalutary muſt be as neceſſary as it may prove intereſting and beneficial. For, on the choice of proper or improper tea, muſt greatly depend the health or diſeaſe of the public in general. To this may be attributed the conſtitution being either preſerved from that innumerable train of afflictions, which ariſe from too great a relaxation of the nervous ſyſtem by acute diſtempers, misfortunes, &c. or being ſo debilitated by exceſſive drinking of India Tea, as to

render it alone the prey of melancholy, palſies, epilepſies, night-mares, ſwoonings, flatulencies, low ſpirits, hyſteric, and hypochondriacal affections. For tea that is pernicious is not only poiſon to thoſe who, from any cauſe of corporal debility or mental affliction, are liable to the above diſeaſes,—but it is alſo too frequently found to render the moſt healthy victims of theſe alarming complaints. And as nervous diſorders are the moſt complicated in their diſtreſſing circumſtances, the greater care ſhould be taken to avoid ſuch aliments as produce them, as well as to chooſe thoſe which are the moſt proper for their relief and prevention. Thoſe who are now ſuffering from the inconſiderate uſe of improper tea, what pitiable objects of diſtreſs and diſeaſe do they not preſent for the caution of thoſe who may, timely, preſerve themſelves? Nervous diſorders are the moſt formidable, by being the moſt numerous in their attacks upon the human frame. Every moment, comparatively ſpeaking, produces ſome new diſtreſs of mind or body. The imagination cannot avoid the horrors of its own creation, while the memory is harraſſed with the ſhadows of departed pleaſures which ſerve but to encreaſe the pain of exiſting torments. All the endearments of life are vaniſhed to the poor wretch who ſees himſelf ſurrounded by the ſpectres of diſmay, terror, deſpondency, and melancholy. And ſuch are but the thouſandth part of the afflictions that are to be avoided or produced by the choice of the prevailing beverage of tea. Not only the innumerable train of nervous afflictions, but all thoſe diſorders that ariſe from an improper temperature of the fluids may be produced from the action, corroſion, and ſtimulation of pernicious teas. In proportion to the ſtate of the fluids, in particular conſtitutions, they may either prove too relaxing or aſtringent, too condenſing or attenuating, and too acrid or viſcid: for India teas, that to ſome conſtitutions are very diluting, may produce in others contrary

effects.

effects. Therefore, ſuch ſhould be choſen as poſſeſs a combination of quality that may render them, as nearly as poſſible, to a general ſpecific. But this cannot be well expected where one ſimple ingredient is uſed, and that is diſtinguiſhed for its particular qualities, which, if wholeſome, can only be ſuch to thoſe whoſe fluids are ſo by nature or circumſtances, as to require ſuch a particular aſſiſtant; for to every other ſtate of the fluids they muſt be pernicious. It is conſequently evident, that if teas imported from India have any virtues, they cannot be ſuch as to render them worthy of being univerſally adopted as a general aliment. If wholeſome to a few, they muſt be pernicious to the reſt of mankind, with whoſe conſtitutions they have no congeniality, medicinal, or alimentary virtue. Suppoſing they may poſſeſs ſome phyſical properties like all other medicines, they can only benefit ſuch diſorders as nature particularly formed them to relieve. Thoſe who have been advocates for their poſitive virtues, have, in this inſtance, but more confirmed the impropriety of adopting them as a general morning and evening beverage. This only explains more evidently the cauſe of ſo many being injured, where one is benefited, by drinking conſtantly India tea. There cannot poſſibly be ſtated a more ſelf-evident propoſition than where any ſimple or combined matter is adopted for a particular purpoſe, it muſt, in every oppoſite inſtance, prove injurious. In proportion, therefore, to ſuch particular qualities, they are the more improper to be generally and indiſcriminately adopted. This obſervation, although it may be applied to every art or ſcience, is ſtill more applicable to phyſic. Thus is it found that no medicine can be ſafely taken as a conſtant and general aliment. Even thoſe who, at firſt, might find it beneficial in their reſpective complaints, have too frequently found the conſtant uſe of it afterwards hurtful to the conſtitution it had before relieved.

relieved. It may be deduced from the above conſiderations, that India teas, however phyſically beneficial, to allow them all their beſt of praiſe, muſt be as an aliment generally injurious. Inſtead of preſerving health, they ſow innumerable diſorders, which can only be cured by ſubſtituting a beverage from ſuch ſalutary native or exotic herbs as are formed for the particular afflictions the former have ſo pitiably brought upon the too greater part of mankind.

As almoſt every diſorder to which the human frame is liable may be retarded in its cure, if not confirmed in the conſtitution by the power of ſecretion being weakened, India teas are the moſt dangerous that can be poſſibly uſed as a general beverage. By too much dilating the canals, the concuſſive force of the ſides are encreaſed, which deſtroys the oſcillatory motion, and thus are the ſecretions altered and diſturbed; and as the action of medicines conſiſts in removing impediments to the equal motion of the fluids, the greater care ſhould be taken to abſtain from all food or drink that may encreaſe thoſe impediments. That India teas not only encreaſe but occaſion ſuch evils is evident, from their having been experienced to relax the tone and reduce the conſiſtence of the ſolids. As the powers of ſecretion depend upon the juſt equilibrium of force between the ſolids and the liquids, the latter muſt, in the above inſtance, make a greater *impetus* upon one part than another, from which proceeds that morbid ſtate ſo juſtly and emphatically termed diſeaſe. Thus, according to the learned Boerhaave, to heal is to take away the diſeaſe from the body; that is, to remove and expel the cauſes which hinder the equal motion or transflux. Medicines, he ſays, are thoſe mechanical inſtruments by which an artiſt may remove the cauſes of the balance being deſtroyed, and thus re-inſtate the loſt equilibrium of the ſolids and liquids. He, therefore, concludes that a medicine ſuppoſes a flowing of the humours or liquids; that it operates mecha-

mechanically; that it acts only mediately; that its good or bad effects depend entirely on the bulk, motion, and figure of the acting particles, and that the deſtruction of the balance muſt be deduced from the ſolids. So that, as it has been found that the ſolids are waſted and impaired by the conſtant uſe of India tea, the chief cauſe of diſeaſe, in general, may be attributed to ſuch a pernicious cuſtom; even the properties which he aſcribes to medicine are in direct oppoſition to what have been found to be the prevailing effects of teas imported into Europe. It is conſequently evident, that the drinking of this injurious tea being not only, in its operation, productive of diſeaſe in its general ſenſe, but alſo repugnant to the ſalutary operation of medicine, it is the moſt dangerous beverage that can be generally taken; for it appears, from the above conſideration, that its pernicious effects are not confined to any ſyſtem of diſorders; it is found inimical to the firſt principles of health, and, therefore, may be juſtly dreaded as capable of being the ſource of diſeaſe indefinitely underſtood.

Having thus ſtated, as an introduction to this Eſſay on Teas, the general tendency of thoſe imported from India, under the titles of Green, Souchong, and Bohea, to injure the conſtitution, the following pages will be particularly devoted to the conſideration of the nature, preparation, and manner of uſing, and the effects of ſuch foreign teas.

ESSAY

ESSAY ON TEAS.

NATURE.

THERE is, perhaps, no ſubject on which there has been more declamation, for and againſt its properties and effects, than thoſe of teas imported into this country by the companies trading from the different maritime nations of Europe to China and India. Nor has there been a controverſy in which the health of the community has been ſo materially concerned, that has afforded ſo little direction of moment to thoſe who would wiſh to aſcertain the truth of ſuch teas being either beneficial, injurious, or innocent in their effects. Amidſt a maſs of declamatory aſſertion ſo little intelligence is to be gained, that thoſe who have had the greateſt intereſt in being informed of the real qualities of teas, have moſtly abandoned the enquiry before they obtained the leaſt knowledge of what they ſought. Either perplexed with abſtruſe ſcience or diſſatisfied with aſſertion equally unfounded and unſupported, thouſands have diſcontinued the reſearch, and committed themſelves to fatal experience. Thus have too many acquired a knowledge of the detrimental qualities of teas, by the ruin of their conſtitution. To avoid, therefore, ſuch an inconvenience, the greateſt care will be taken to prevent an indiſcriminate reference to authors whoſe ſentiments can neither ſanction adduced arguments or illuſtrate technical alluſions. The enquiry will be made with ſome reference to ſcience,

ence, but more to convince by demonſtration than to confound by abſtruſe perplexities. So that, while empty declamation is avoided, the principles of truth are meant to be inveſtigated by reaſon and experience. With this view, the

NATURE

of green, ſouchong and bohea teas, are firſt conſidered. To judge of the nature of theſe herbs with equal candour and propriety, it may be neceſſary to conſider their qualities in relation to what are aſcribed them, what have been diſcovered by their analyſis, and what have reſulted from experience. The virtues that have been aſcribed to them are chiefly, being a grateful diluent in health, and ſalutary in ſickneſs, by attenuating viſcid juices, promoting natural excretions, exciting appetite, and proving particularly ſerviceable in fevers, immoderate ſleepineſs, and head-achs, after a debauch. It is alſo added to the liſt of their aſcribed virtues, that there is no plant yet known, the infuſions of which paſs more freely from the body, or more ſpeedily excite the ſpirits. To a perſon of any phyſical knowledge, theſe qualities will either appear contradictory in themſelves, or rather ultimately injurious, than abſolutely beneficial. As the full examination of theſe aſſumed qualities, by the rules of ſcience, would require a volume, inſtead of a few pages, which the limits of this Eſſay will afford; the enquiry muſt be made as perſpicuous as the neceſſity of brevity will admit. Allowing they are diluting in health, their conſtant uſe may ſo attenuate the liquids as to deſtroy their natural force and tenſity. But Boerhaave ſays, there is no proper diluent but water. It is, therefore, evident it is the water, and not the tea, which is the diluting medium. With reſpect to its being an attenuative of viſcid humours, it can never poſſeſs this virtue from being a diluent, for an attenuant acts *ſpecially* on the particles, by diminiſh-

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ing their bulk while the diluent acts upon the whole mass of the fluid.

The general body of the liquid may be diluted while the viscid humours remain unresolved. Indeed the operation of an attenuant is not easily known; for many are surprised that a slight inflammation should be so difficult to dissipate. But their surprise would cease were they to consider, that medicines act more generally upon the whole body than abstractedly upon the part affected. Suppose to attenuate some coagulated blood, six grains of volatile salt were given, how small a proportion must come to the part diseased, when these few grains, by the laws of circulation, will mix with the entire mass of blood, consisting at least of thirty pounds!

Teas being said to promote natural excretions, can be no recommendation of what is so generally used; for this constant effect must render them too copious, and thus, according to all physical experience, the blood must be thickened in the greater vessels, which frequently terminates in an atrophy.

The appetite being excited by the drinking of tea is more a proof of its attrition of the solids than any stimulus to a wholesome desire of food. This quality accounts for the acrimonious effects too many have experienced by its use. Many have not only had their blood impoverished, but corrupted by the constant drinking of these teas. Whether it arises from any positive acrimonious salt it naturally possesses, or from any acquired corrosiveness from its mode of drying, is not here necessary to enquire: it is only requisite to state that a pernicious effect is too fatally experienced by those who are unfortunately its slaves.

How India tea can be serviceable in fevers is not easy to be understood; for, if it has that effect upon the nerves to excite watchfulness, it must greatly tend to encrease, instead of diminish, feverish symptoms. Dr. Buchan attributes even one cause of the palsy to

drinking

drinking much tea or coffee, &c. and, in a note, he ſubjoins: "Many people imagine that tea has no tendency to hurt the nerves, and that drinking the ſame quantity of warm water would be equally pernicious. This, however, ſeems to be a miſtake. Many perſons drinking three or four cups of warm milk and water daily, without feeling any bad conſequences; yet, the ſame quantity of tea will make their hands ſhake for twenty-four hours. That tea affects the nerves is likewiſe evident from its preventing ſleep, occaſioning giddineſs, dimneſs of the ſight, ſickneſs, &c."

With regard to India teas poſſeſſing the quality of exciting the ſpirits, this, like every other ſtimulus, either by conſtant uſe loſes its effect, or unnerves the ſyſtem it is meant to ſtrengthen. The nerves through which the animal ſpirits circulate, being like the ſtrings of a violin or harpſichord, too frequently braced, loſe, at laſt, their natural tenſity, and thus, render the human frame one ſyſtem of debility.

Having thus, as briefly as poſſible, ſtated that even their aſcribed virtues are either derogatory to all phyſical principle, or elſe deſtructive to the conſtitution, from their conſtant uſe; the nature of India teas is next conſidered, with reſpect to what appears to be their chief component parts, from analization.

Teas have been found to conſiſt principally of narcotic ſalts, ſome aſtringent oil, and earth. Theſe being found in greater quantities in bohea than in green teas, thoſe who have very ſenſible and elaſtic nerves, muſt be ſeized with a greater tremor after drinking the former than the latter. The continual and regular influx of the nervous juices is ſtopped by their component fibres being contracted from the roughneſs and reſtringency of ſuch decoctions. The force of the heat, or the brain's propulſion of its nervous juice, being inferior to the reſiſtence of the whole ramified fibres thus encreaſed by the ſudden contraction and unequal

unequal motion, the flow of the animal ſpirits muſt be greatly impeded and diſordered. In fact, the influx ſuffers a ſuſpenſion until the fibres, by relaxing again, admit their empty tubes to receive their appropriated liquids. Thus even green tea muſt, eſpecially if taken ſtrong and often, ſtop the natural circulation of humours, and produce the attendant defects of depreſſion of ſpirits, deficiency of ſecretion, loſs of appetite, decreaſe of ſtrength, waſte of body, and, finally, a total want of effective vigour in all the animal functions. But, as above obſerved, bohea tea poſſeſſing in greater quantity the pernicious ingredients, the veſſels are thrown into momentary ſpaſms and convulſive vibrations, by the relaxing power of the narcotic ſalts, and the contracting force of the aſtringent oil and earth. And here, it muſt be noticed, that oil, mixed with ſalt, is rendered aſtringent: thus all vegetables, where a mixture of both prevails, are reckoned ſtimulating. The narcotic power of the ſalt is derived from its hindering the flux of the animal ſpirits through the nerves.

The ſtomach and bowels being weakened by the above cauſes, windy complaints, or flatulencies, are conſequently produced. This cauſed Dr. Whytt, in his advice to patients afflicted with ſuch diſeaſes, to deſire they would abſtain from India tea, as one of the flatulent aliments chiefly to be avoided.

If the ſlighteſt external motion alone produces the following changes in the body, what effects may not be aſcribed to the conſtant uſe of teas, which we find, as before ſtated, operate internally? A perſon in perfect health, having his noſtrils only touched with a feather, cannot avoid his body being ſo convulſed, as to produce what is commonly called ſneezing. But if the number of muſcles agitated, the force and ſtraining of the body by ſneezing are conſidered, the ſlightneſs of the cauſe muſt excite no little aſtoniſhment; for this action is occaſioned by the muſcles of the

the ſcapula, abdomen, diaphragm, thorax, lungs, &c. and if the ſneezing continues, an univerſal exploſion of the liquids enſues: tears, mucus, ſaliva, and urine, are excreted. Thus without any moiſt, cold, hot, dry ſulphur, ſalt, or any other internal or external application, an involuntary motion of all the ſolids and fluids is produced by a feather touching, in the ſlighteſt manner, the inſide of our noſtrils. But Boerhaave relates further, "That if ſneezing continues a "long time, as it will by taking one hundredth part "of a grain of euphorbium up the noſe, grievous and "continued convulſions will ariſe, head-achs, involuntary excretions of urine, &c. vomitings, febrile "heats, and other dreadful ſymptoms; and, at laſt, "death itſelf will enſue." It is therefore evident that the ſlighteſt bodies produce the greateſt changes in the human frame.

Such is the power of certain particles upon the nerves, that the ſtomach will be thrown into convulſions that almoſt threaten an inverſion, by taking only four ounces of a wine in which ſo ſmall a portion of glaſs of antimony, as one ſcruple is infuſed in eight pounds of the former. And what is ſtill more remarkable is, that the glaſs of antimony remains not only undiſſolved, but, comparatively ſpeaking, undiminiſhed in its weight.

Theſe being a few of the fatal afflictions which experience ſhews to be frequently the conſequence of drinking India teas, its injurious nature is too evident to require any further inveſtigation of either their aſcribed or poſitive qualities. The next ſubject to be conſidered, relative to India teas, is their

PREPARATION.

Among the different Authors of any conſequence that have written on the culture, preparation, and virtues of foreign teas, may be ranked Kampfer, Poſtlethwaite, Dr. Cunningham, Prieſtly, Lemery, Franchus,

chus, Meiſter, and Sigeſbeck; as the limits of this Treatiſe will not permit a detail of obſervations from the whole of theſe writers, remarks can only be ſelected from the moſt principal of them. Moſt of the above, and many other Authors, agree that the leaves are ſpread upon iron plates, and thus dried with ſeveral little furnaces contained in one room. This mode of preparation muſt greatly tend to deprive the ſhrub of its native juices, and to contract a ruſt from the iron on which it is dried. This may be probably the cauſe of vitriol turning tea into an inky blackneſs. We, therefore, do not think with Boerhaave, that the preparers employ green vitriol for improving the colour of the finer green teas. It may, however, be concluded, from the colour of bohea, ſouchong, and ſuch as are called black teas, that they may be thus tinctured, by the means of vitriol, after they have been dried upon the iron plates in the furnace room. And this may, likewiſe, particularly cauſe that aſtringent quality which is more experienced in all the black than any of the green teas. According to Sigeſbeck, the colours of theſe teas are artificial; ſo that if theſe pernicious arts are uſed even to give the tea a particular colour, there is no difficulty in aſcribing the cauſe of their injurious effects.

That the native virtues of theſe teas are liable to conſiderable perverſion, is evident from the manner in which Meiſter relates that they are prepared. He ſays the leaves are put into a hot kettle, juſt emptied of boiling water; and that they are kept in this cloſely covered until they are cold, when they are ſtrewed upon the hot plates above-mentioned for drying. It is eaſy to conceive how the virtues of a leaf, however ſalutary by nature, muſt be deſtroyed by ſuch a proceſs. Being thus put into a ſteaming kettle, and ſuffered to remain there until they are cold, muſt cauſe the greater part of their virtues to evaporate, and the leaves to imbibe an unwholeſome taint from the ef-

fluvia

fluvia of the ſteaming metal. It cannot, therefore, be aſcertained whether teas that are imported in Europe, after ſuch a mutating preparation, have the leaſt remains of their original odour or flavour, no more than they have of their qualities. But, on the contrary, it ſeems impoſſible but that the original nature of this ſhrub is entirely deſtroyed by an artificial preparation. Some falſely ſuppoſe that this ſpecies of management is only to ſoften ſuch of the leaves as are grown too dry, and are therefore liable to break in the curling. But this will evidently appear not the cauſe, when it is conſidered that the greater part of the teas muſt dry in ſuch a hot climate while they are gathering. And as they are particularly anxious to ſend them in as curious a curled ſtate as poſſible, ſuch teas muſt be thus moiſtened again, in order to curl them afterwards in that perfect manner which is performed on the iron plates of the furnaces.

The opinion, therefore, of teas deriving their green colour from being dried upon copper being founded on a miſrepreſentation of the manner in which they are really prepared, a few obſervations upon the ſubject are indiſpenſably neceſſary. For thoſe who have always underſtood that the detrimental qualities of foreign teas were the conſequence of their being dried upon copper, may, perhaps, imagine they cannot be ſo pernicious if they were dried upon iron; but this opinion cannot be entertained by any perſons who have the leaſt knowledge of the manner in which the vegetable acid will corrode iron. Thoſe who are acquainted with culinary proceſſes, muſt know in what manner the acid of onions will operate upon any ſteel inſtrument; it corrodes a knife ſo as to turn the onions black, with the particles eaten away from the edge and ſurface of the blade. To avoid this unwholeſome and unſeemly inconvenience, a wooden inſtrument is generally uſed in all inſtances where onions form a part of the cookery appendages. It is conſequently evi-

dent, that although iron utenſils are now greatly uſed inſtead of copper, yet many injurious effects may happen from their being liable to be corroded by the acid of ſeveral vegetables. And if the nitrous acid of the air will corrode iron ſo as to cauſe ruſt, when it will not produce the proportionate effect upon copper, it is a demonſtration that iron is the moſt liable to ſuch a corruption. The corroſions of copper are undoubtedly pernicious; but the damage that tea would derive from its being dried upon ſheets of this metal would not operate ſo injuriouſly to thoſe who drink it as it does now by lying dried upon iron. For the latter being more liable to the power of the mineral, vegetable, or animal acid, muſt impart more particles of its reduced calx to the tea than copper would. And, in order to ſhew how ſuſceptible of corroſion iron is, the following inſtance is farther adduced: in Ireland, where ſome perſons practiſe the art of tanning leather with fern, which poſſeſſes a very ſtrong acid, particular care is taken to avoid uſing any iron veſſels in the tannage, leſt the colour of the leather ſhould be blackened by the corroding particles of the metal. As it is the peculiar property of iron or ſteely particles, even in their moſt perfect ſtate, to operate as too great an aſtringent for an aliment that is taken twice a day conſtantly, tea, when dried upon it, muſt be rendered proportionably pernicious. But admitting that the popular opinion of their being dried upon copper was juſt, the teas muſt be rendered proportionably injurious to the quantity of copperas or crude vitriol they imbibe from their acidity corroding the metal. Preparations of ſteel, that are, in many inſtances, conſidered as moſt ſalutary, yet in all pulmonary diſorders the moſt eminent phyſicians have deemed them exceedingly dangerous. And in a country, like Great Britain, Holland, and other places, where a cloudy atmoſphere, cauſed from their marſhy ſoil or watery ſituation, renders moſt of the inhabitants ſubject to com-

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plaints of the lungs, foreign teas, contaminated by theſe iron corroſions, muſt be particularly detrimental. It is therefore, from theſe conſiderations, evident, that foreign teas, by being dried upon iron, have their bad qualities ſo encreaſed as to render them the moſt pernicious of any morning and evening liquid that has yet been taken. To return from whence we began this ſhort digreſſion.

It is remarkable that no ſatisfactory account has yet been given in what the bohea differs from the green tea. Dr. Cunningham, phyſician to the Engliſh ſettlement at Chuſan, and Kampfer aſſert, that the bohea is the leaves of the firſt collection.

This, however, being contrary to the general report of all travellers, that none of the firſt produce is brought to Europe, muſt be diſcredited; for theſe are all reſerved for the Princes, to whom they are ſold, even in China, at an immenſe price. Another proof is, that the boheas are brought here in the moſt conſiderable quantities, at a price greatly inferior to what even the ſecond, third, and fourth crops are ſold for in China. This not only evinces how inferior in quality the black tea muſt be, but alſo how little they are valued among thoſe who muſt be acquainted with their properties.

Although the European dealers divide the green teas chiefly into three ſorts, and the bohea into five, yet it is unknown from what province they are brought, of what crop they are the produce, and to which of the Chineſe ſorts they belong.

Added to their abuſe of preparation may be that of their package. It is impoſſible but to know that their bad qualities muſt be conſiderably augmented by being ſo cloſely packed, for ſuch a length of time, in ſuch ſlight wooden cheſts, lined with a compoſition of wood and lead. Conſiderable quantities are likewiſe damaged by ſalt water and other cauſes, which, by the management of the tea dealers, are moſtly

mixed and ſold under different denominations. How the tea muſt be affected by the corroſion of the lead and tin by the marine acid, thoſe of the leaſt chemical knowledge will eaſily determine. To what danger muſt, therefore, the conſtitution of thoſe who are in the conſtant habit of drinking ſuch an empoiſoned drug be expoſed, may eaſily be imagined. Surely, when all theſe circumſtances are conſidered reſpecting the pernicious mode of preparation, and particularly the poiſonous qualities they are alſo liable to contract from the nature of their package, every perſon muſt be convinced to what a loſs of health, if not of life, the conſtant uſe of ſuch teas muſt expoſe them. Such evidence of their deleterious tendency is almoſt ſufficient to alarm mankind againſt ſo prevailing an evil, without any further arguments; but as health is too precious not to require every poſſible proof that can perſuade us to avoid what ſo immediately threatens our exiſtence, the following arguments and teſtimonies of the bad qualities of foreign teas muſt not be omitted. Previous, however, to an inveſtigation of their effects, it may be neceſſary to ſay a few words reſpecting the

MANNER OF USING

foreign teas, as before obſerved, being taken as two principal meals of our daily aliment, is undoubtedly one great reaſon of the conſtitution of the people having ſuffered an entire change in its ſyſtem. That vigour, ſpirits, and longevity, which characteriſed us in the laſt century, is totally ſubverted; diſeaſe, diſmay, and debility, now leads us prematurely to the grave, where we end an exiſtence too deplorable to excite the leaſt deſire for a longer continuance. Dr. Prieſtly ſtates, very juſtly, in his Medical Eſſays, that it is curious to obſerve the revolution which hath taken place, within this century, in the conſtitutions of the inhabitants of Europe. Inflammatory diſeaſes

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more rarely occur, and, in general, are much leſs rapid and violent in their progreſs than formerly; nor do they admit of the ſame antiphlogiſtic method of cure which was practiſed with ſucceſs a hundred years ago. The experienced Sydenham makes forty ounces of blood the mean quantity to be drawn in the acute rheumatiſm; whereas this diſeaſe, as it now appears in the London hoſpitals, will not bear above half that evacuation. Vernal intermittents are frequently cured by a vomit and the bark, without venæſection, which is a proof that, at preſent, they are accompanied with fewer ſymptoms of inflammation than they were wont to be. This advantageous change, however, is more than counterbalanced by the introduction of a numerous claſs of nervous aliments, in a greater meaſure, unknown to our anceſtors, but which now prevail univerſally, and are complicated with almoſt every other diſtemper. The bodies of men are enfeebled and enervated, and it is not common to obſerve very high degrees of irritability under the external appearance of great ſtrength and robuſtneſs. The hypochondriac, palſies, cachexies, dropſies, and all thoſe diſeaſes which ariſe from laxity and debility, are, in our days, endemic every where; and the hyſterics, which uſed to be peculiar to the women, as the name itſelf indicates, now attacks both ſexes indiſcriminately. It is evident that ſo great a revolution could not be affected without the concurrence of many cauſes; but amongſt theſe, I apprehend, the preſent general uſe of tea holds the firſt and principal rank. The ſecond cauſe may perhaps be allotted to exceſs in ſpirituous liquors. This pernicious cuſtom owes its riſe to the former, which, by the lowneſs and depreſſion of ſpirits it occaſions, renders it almoſt neceſſary to have recourſe to what is cordial and exhilirating; and hence proceeds thoſe odious and diſgraceful habits of intemperance with which too many of the ſofter ſex of every degree are now, alas!

chargeable. Theſe are the ſentiments of a character diſtinguiſhed for his elaborate reſearches and judicious diſcoveries in almoſt every branch of liberal ſcience. It may therefore be ſafely concluded, that the general manner of uſing India tea, morning and evening, has been, and is the principal cauſe of the greater part of the diſeaſes with which the natives of Europe are now afflicted. When it is conſidered that the firſt meal which is taken to recruit the body, after the loſs it ſuſtains from the inſenſible perſpiration of the preceding night, and to prepare it for the avocations of the ſucceeding day, is India tea, who can be ſurpriſed that nature ſhould rapidly become the victim of diſeaſe? Thus, inſtead of being ſupported by nutritious aliment, its nerves are enfeebled, its ſpirits diminiſhed, and all its functions enveloped with the gloom of melancholy. Even in the afternoon, when nature is exhauſted by care and fatigue, we fly for refreſhment to tea, which, inſtead of bracing, ſtill further relaxes the unnerved ſyſtem. Such are the evil effects of the imprudent manner in which this pernicious drug is ſo conſtantly and univerſally uſed. But how muſt theſe evils appear in their extent, when the following view is taken of India teas, with regard to their variety of injurious

EFFECTS.

In all the phyſical experiments that have been made upon India teas, there is, perhaps, none that ſhews its acid aſtringency more than one tried by the above writer, Dr. Prieſtley. Endeavouring to trace the difference and aicertain the aſtringency and bitterneſs of vegetables reciprocally bear to each other, he imagined he had found they were diſtinct and ſeparate properties, by the following experiment: Taking two pieces of calf-ſkin juſt ſtripped from the calf, he immerſed them in cold infuſions of green and bohea tea; at the expiration of a week he found they were hard

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and curled up, and that there was no ſenſible difference between them. He therefore concluded, that this experiment afforded a ſtriking proof of India tea differently affecting a dead and a living fibre; this he conſidered as the greateſt effect of a medicine. But with deference to ſo diſtinguiſhed an author, I cannot but attribute this aſtringency of the ſkin to the particular properties of India tea; for all phyſical as well as medical experience proves that vegetable produce afford ſome that are aſtringent, and others that are relaxant, of the dead as well as the living fibre.

Oak bark is equally aſtringent, and hardens the fibres of the hide, as well as it braces the living nerve of our bodies; therefore the effect produced by the India tea upon the dead ſkin only proves what we have before related, that an infuſion of it has a peculiar effect, which, being too frequently applied to the nerves, deſtroys their tenſity by their fine fibres being either broken or relaxed by overbracing. Were any aſtringent to be conſtantly taken, it muſt ultimately produce more or leſs ſuch an effect; ſo that while the above experiment of the learned Philoſopher demonſtrates that India tea has the power of aſtringing the dead as well as the living fibres, it does not prove that aſtringency and bitterneſs are ſeparate qualities. On the contrary, bitterneſs ſeems to be the characteriſtic taſte of all that has the tendency to contract whatever is the ſubject of its application. Thus galls, bark, rhubarb, camomile tea, &c. &c. are all bitter and aſtringent. It is, therefore, the immoderate uſe of ſuch an aſtringent that ultimately relaxes and debilitates; like the too frequent bracing of a drum, or any other ſtringed muſical inſtrument, deſtroys its tenſity, the body is unnerved by the overſtretching of its fibres. Although we ſometimes differ with the celebrated Doctor in part of the concluſion he has drawn from his experiment, yet the following ſentiments ſo perfectly coincide with all our obſervations upon India

teas,

teas, that we are happy to have the opportunity of corroborating our own with the ſentiments of ſo eminent a Philoſopher. He ſays, from his experiments, "It appears that green and bohea teas are equally "bitter, ſtrike preciſely the ſame black tinge with "green vitriol, and are alike aſtringent on the ſimple "fibre. From this exact ſimiliarity in ſo many cir-"cumſtances, one ſhould be led to ſuppoſe that there "would be no ſenſible diverſity in their operation on "the living body; but the fact is otherwiſe; green "tea is much more ſedative and relaxant than bohea; "and the finer the ſpecies of tea, the more debili-"tating and pernicious are its effects, as I have fre-"quently obſerved in others, and experienced in my-"ſelf. This ſeems to be a proof that the miſchiefs "aſcribed to this oriental vegetable do not ariſe from "the warm vehicle by which it is conveyed into the "ſtomach, but chiefly from its own peculiar quali-"ties." Dr. Hugh Smith, in his Treatiſe on the Action of the Muſcles, juſtly ſays, than an infuſion of India tea not only diminiſhes but deſtroys the bodily functions. *Thea infuſum, nervo muſcolove ranæ admotum, vires motices minuit perdit.* Newman, in his Chemiſtry, ſays, when freſh gathered, teas are ſaid to be narcotic, and to diſorder the ſenſes; the Chineſe, therefore, cautiouſly abſtain from their uſe until they have been kept twelve months. The reaſon attributed for bohea tea being leſs injurious than green, is being more haſtily dried, the pernicious qualities more copiouſly evaporate.

"Tea," ſays Dr. Hugh Smith, in his Diſſertation upon the Nerves, "is very hurtful both to the ſto-"mach and nerves. Phrenſies, deliriums, vigilation, "idiotiſm, apoplexies, and other diſorders of the brain, "are all produced by the nerves being thus diſar-"ranged and debilitated. If the digeſtive faculty of "the ſtomach be weakened, the body, failing of re-"cruiting juices, muſt tend to emaciation, and the

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" whole frame be rendered one ſyſtem of diſtreſs and
" infirmity. The nerves being thus deprived of a
" ſufficiency of their animal ſpirits, muſt become lan-
" guid, and leave every ſenſe void of the firſt means
" of conveying to the mind the only enjoyments of
" our temporal exiſtence.

" But if there be any claſs of perſons to whom In-
" dia tea is more particularly hurtful than to any
" other, it is that which includes the ſtudious and
" ſedentary, and eſpecially thoſe who are enfeebled
" with gout, ſtone, and rheumatiſm; age, accident, or
" avocation, cauſe many perſons to be unfortunately
" ranked amongſt thoſe of the latter deſcription.
" Theſe, from their intenſity of thought, want of ex-
" erciſe, injurious poſition of body, reſpiration of
" unwholeſome air, and a variety of other cauſes,
" have not only their animal ſpirits exhauſted, but
" their liquids corrupted from the loſs of a neceſſary
" circulation. With theſe evils India tea operates as
" an abſolute poiſon. Indeed, it frequently renders
" thoſe incurable, who might, by other means, have
" been relieved.

" When a view is taken of the diſmal effects pro-
" duced by India teas, the minds ſeems to be bewil-
" dered in ſearching for the cauſe of uſing ſo gene-
" rally a drug that is ſo univerſally deſtructive. It
" chiefly originated in a fundamental miſtake of phy-
" ſical principles. About the time that India tea was
" introduced to Europe, a grievous error crept into
" the practice of medical profeſſors; they falſely ima-
" gined that health could not be more promoted than
" by increaſing the fluidity of the blood. This opi-
" nion once eſtabliſhed, it is no wonder that mankind,
" with one accord, adopted the infuſion of India
" tea, which was then a novelty to Europe, as the
" beſt means of obtaining the above effect. By the
" advice of Bentikoe chiefly was the pernicious
" cuſtom of drinking warm liquors night and day eſta-
" bliſhed.

" bliſhed. To this man, and the introduction of In-
" dia tea, may be aſcribed that revolution in the health
" of Europeans which has happened ſince the laſt cen-
" tury. The preſent age, therefore, have great cauſe
" to lament, in what they ſuffer in nervous complaints,
" that their forefathers did not attend more to the ſci-
" entific and judicious advice of the illuſtrious Dun-
" can, Boerhaave, and the whole ſchool of Leyden,
" who proſcribed this error. Although they could
" not entirely prevent this phyſical abuſe, yet their
" zealous endeavours did, in ſome degree, at firſt
" impede its progreſs; but, however, ſo powerful did
" novelty plead in favour of India teas, that, at laſt,
" general cuſtom and prejudice bore away every bar-
" rier that had been erected by theſe learned and ex-
" perienced phyſicians. This terror, inſtead of di-
" miniſhing, has increaſed; moſt valetudinarians are
" now of opinion, that a thick blood is the ſole cauſe
" of their complaints. With this impreſſion, they
" adopt what they call the diluent beverage of India
" teas. It can ſcarcely be imagined how many diſ-
" orders this practice produces; it may be juſtly
" termed the box of Pandora, without even hope re-
" maining at the bottom." Tiſſot ſays, " They are
" the prolific ſources of hypochondriac melancholy,
" which both adds ſtrength to and is one of the worſt
" of diſorders." He adds, " with regard to ſtudious
" men, who are naturally weak and feeble, ſuch warm
" beverages are more hurtful to them than to others;
" for they are not troubled with an over thick, but,
" on the contrary, too thin a blood. You are all
" aware," continues he, " reſpectable auditors, that
" the denſity of the blood is as the motion of the ſo-
" lids; the fibres of the learned are relaxed, their mo-
" tions are ſlow, and their blood, of conſequence,
" thin. Bleed a ploughman and a doctor at the ſame
" time; from the firſt there will flow a thick blood,
" reſembling inflammatory blood, almoſt ſolid, and

" of

" of a deep red; the blood of the latter will be either " of a faint red, or without any colour, ſoft, gelati- " nous, and will almoſt entirely turn them to water. " Your blood, therefore, men of learning, ſhould " not be diſſolved, but brought to a conſiſtence; and " you ſhould in general be moderate in the article of " drinking, and cautiouſly avoid warm ſpirituous li- " quors.

" Amongſt the favourite beverages of the learned," the ſame Tiſſot obſerves, " is the infuſion of that fa- " mous leaf, ſo well known by the name of Indian " tea, which, to our great detriment, has every year, " for theſe two centuries paſt, been conſtantly im- " ported from China and Japan. This moſt-pernici- " ous gift firſt deſtroys the ſtrength of the ſtomach, " and if it be not ſoon laid aſide, equally deſtroys " that of the viſcera, the blood, the nerves, and of " the whole body; ſo that malignant and all chronical " diſorders will appear to increaſe, eſpecially nervous " diſorders, in proportion as the uſe of Indian tea " becomes common; and you may eaſily form a judg- " ment from the diſeaſes that prevail in every coun- " try, whether the inhabitants are lovers of tea or " the contrary. How happy would it be for Europe, " if, by unanimous conſent, the importation of this " infamous leaf were prohibited, which is endued " only with a corroſive force, derived from the acri- " mony of a gum with which it is pregnant."

Having thus conſidered the diſmal and too frequently fatal conſequences of the nerves being affected, it is preſumed this part of the Eſſay cannot be more intereſtingly concluded than by a ſummary of the diſtinct ſymptomatic effects attending, more or leſs, complaints of the nerves; and although the following ſymptoms are alarming with regard to their number and variety, yet the reader may be aſſured there is not one ſpecified but what is either the immediate or ultimate effect of a nervous affection, and

which

which is too frequently the conſequence of the violent aſtringency of foreign tea taken injudiciouſly as a conſtant aliment.—A faintneſs, ſucceeded with a deluſive viſion of motes, miſts, and clouds falling backwards and forwards before the diſtempered ſight—A yawning, gaping, ſtretching out of the arms, twitching of the nerves, ſneezing, drowſineſs, and contraction of the breaſt—Dulneſs, debility, diſtreſs, and diſmay, with a great ſenſe of wearineſs—A wan complexion, a languid eye, a loathing ſtomach, and an uncertain appetite, which, if not immediately ſatisfied, is irremediably loſt—Heart burning, bilious vomitings, belchings, pains in the pit of the ſtomach, and ſhortneſs of breath—Dizzineſs, inveterate pains in the temples and other parts of the head, a tingling noiſe in the ear, a throbbing of the brain, eſpecially of the temporal arteries—Symptoms of aſthma, tickling coughs, viſible inflations and unuſual ſcents, affecting the olfactory nerves—Sometimes coſtive and ſometimes relaxed—Sudden fluſhings of heat and ſuffuſions of countenance—In the night, alternate ſweats and ſhiverings, eſpecially down the back, which ſeems to feel as if water was poured down that part of the body—A pytaliſm or diſcharge of phlegm from the glands of the throat, which generally attends all the ſymptoms—Troubleſome pains between the ſhoulders, pains attended with hot ſenſations, cramps and convulſive motions of the muſcles or a few of their fibres—Sudden ſtartings of the tendons of the legs and arms—Copious and frequent diſcharges of pale and limpid urine—Vertigoes, long faintings, and cold, moiſt clammy ſweat about the temples and forehead—Wandering pains in the ſides, back, knees, ancles, arms, wriſts, and ſomewhat reſembling rheumatic pains—The head generally warm while the reſt of the body is cold or chilly—Obſtinate watchings, diſturbed ſleep, frightful dreams, the nightmare, ſtartings when awake, and the mind filled with the moſt terrific apprehenſions—Tremors of the limbs and

and palpitations of the heart—A very variable and irregular pulſe—Periodical pains in the head—A ſenſe of ſuffocation, frequent ſighings, and ſhedding of tears—Convulſive ſpaſms of the muſcles, tendons, nerves of the back, loins, arms, hands, and a general convulſion of the ſtomach, bowels, throat, legs, and, indeed, almoſt every other part of the body—A quick apprehenſion, forgetful, unſettled, and conſtant to nothing but inconſtancy—A wandering and delirious imagination, groundleſs fears, and an exquiſite ſenſe of his ſufferings—A gradually ſinking into a nervous atrophy or conſumption—A perpetual alarm of approaching death—Sometimes cheerful, and ſometimes melancholy—Without preſent enjoyment or future expectation of any thing elſe but increaſing miſery and debility—If theſe ſymptoms are inconſiderately ſuffered to continue, they ſoon terminate in palſy, hip, madneſs, epilepſy, apoplexy, or in ſome mortal diſeaſe, as the black jaundice, dropſy, conſumption, &c.

Having aſcertained, from this inquiry, the injurious properties of India tea, it may naturally be expected that I ſhould propoſe ſome article that might prove more beneficial. With this requiſition I ſhall moſt ready comply, although I may expoſe myſelf to the invidious cenſure of having directed all my efforts to eſtabliſh the celebrity of whatever article I may recommend. But being convinced that, by publiſhing the virtue of a tea that I have inveſtigated from phyſical analyſis and particular obſervation, I may eſſentially ſerve the public, I am content to ſuffer the obloquy, provided it is productive of a general benefit. Having, as before obſerved, examined, with the greateſt attention, the nature of moſt articles that have been offered as morning and afternoon beverage, there are two which claim moſt particularly the preference of all others that are ſold under the denomination of tea. Theſe are, 1ſt, that which was diſcovered by that eminent botaniſt, Sir Hans Sloane; and the

other

other, by a botaniſt and phyſician equally celebrated, Dr. Solander. I therefore, without conſidering in what manner the intereſt of the proprietors of theſe teas may be individually affected, propoſe two articles, in order to ſhew my partiality or opinion of the virtues of the one could not prejudice me ſo far as to prevent my allowing due praiſe to any other poſſeſſing qualities deſerving approbation. I am happy to ſtate that, from my analyſis of that invented by Sir Hans Sloane, called Britiſh tea, I found it poſſeſs moſt ſingular virtues for relieving many nervous complaints. But, from the ſame trials and experiments made on that invented by Dr. Solander, I have been convinced that, although the qualities of the former are exceeding ſalutary, they are not ſo general in their reſtoration and nutritious effects as the latter. Being thus convinced of the extraordinary properties of Dr. Solander's tea, I have been induced to ſtate, in a Treatiſe upon their nature, preparation, and effects, reaſons founded on chemical analyſis, phyſical efficiency, and experimental obſervation, in ſupport of their moſt eminent virtues. After every trial I have made of coffee, chocolate,* and moſt other preparations

* "Coffee—In bilious habits it is very hurtful."

Dr. Carr's Medical Epiſtles, page 25.

"Coffee—I cannot adviſe it to thoſe of hardneſs of breathing."

Ibid. page 29.

"Coffee—according to Paule, a Daniſh Phyſician, enervates men, and renders them incapable of generation, which injurious tendency is certainly attributed to it by the Turks. From its immoderate uſe, they account for the decreaſe of population in their provinces that were ſo numerouſly peopled before this berry was introduced among them. Mr. Boyle mentions an inſtance of a perſon to whom coffee always proved an emetic. He alſo ſays that he has known great drinking of it produce the palſy.

"Chocolate is too groſs for many weak ſtomachs, and exceedingly injurious to thoſe liable to phlegm and viſcid humours."

Saunders's Natural and Artificial Directions for Health.

"Chocolate overloads the ſtomach, and renders the juices too ſlow in their circulation."

Smith on the Nerves.

tions that have been, and are at preſent offered to the public as a ſubſtitute for tea, none ſeem to claim the preference ſo eminently as that invented by Dr. Solander. From their analyſis, I find their virtues are of the moſt corrective and balſamic kind; they ſtrengthen the tone of the ſtomach, not by aſtringing the ſolids, but by lubricating the veſſels, ſheathing the acrids, and attenuating the liquids.

In this manner they reſtore the equilibrium of the oſcillatory motions which eſtabliſh the tone of the nervous ſyſtem. This being ſtrengthened, the animal ſpirits are enabled to diſpenſe their reviving influence to the ſenſitive, digeſtive, and intellectual powers. And theſe being thus reſtored to their vigour of operation, a ſimple and moderate portion of food is rendered the moſt nutritious, and the body is conſequently eſtabliſhed in the enjoyment of health and happineſs.

The above virtues of the ſanative tea are not here aſſerted as a declamatory panegyric, but as the reſult of a phyſical analyſis of their nature, and a ſerious examination into their mode of operating as a reſtorative and a conſtant aliment. Without preſuming their qualities to be an unlimited remedy for all complaints, the nature of the preparation of this tea is compared with the cauſes and effects of nervous diſorders: from this compariſon their relative virtue to ſuch diſeaſes are moſt clearly evinced: and thus is this invaluable diſcovery proved to be the moſt effectual remedy for all thoſe complaints, cauſed by drinking foreign teas, that was ever yet or may be hereafter invented.

In propoſing to the Public any Simple or Compound, for the preſerving, increaſing, or reſtoring health, the firſt object ſhould be to explain its nature. This is the principal teſt by which its merits can be known, or mankind rationally induced to try its virtues. And as this ſanative tea is offered as a ſubſtitute for what is generally uſed as two fourths of our aliment,

aliment, and which, from the preceding inquiry, has been found the principal cauſe of our preſent infirmities, the greater neceſſity there is for a candid inveſtigation of its nature.

Impreſſed with the above conviction, it is fairly ſtated that the nature of this ſanative tea is not from any combination of the animal or mineral kingdom, but a collection of the moſt ſalutary native and exotic herbs that are produced in the vegetable empire of nature. Theſe have not been collected by the fanatic devotees of occult qualities, but by the ſcientific reſearches and perſonal experience of a character that is equally and juſtly admired for his philoſophical, medical, and botanical knowledge. The diſcoverer, Dr. Solander, of this tea, inquired into the virtues of each native and exotic herb of which it is compoſed, not only by abſtract reaſoning upon its relative qualities, but by the more immediate evidence of his ſenſes: by ſubmitting each vegetable to his taſte and ſmell, he derived the moſt certain phyſical proof of its qualities. Thus he knew the particular virtues of each, and what ſalutary effects they muſt, from their preparation as a compound, produce when applied as a relief for the innumerable diſeaſes cauſed by drinking foreign teas. Not confining himſelf to *Engliſh Plants*, he ſtudied and examined the virtues of *exotics*, among which he diſcovered ſome that poſſeſs virtues he had not found in thoſe of his own country: by adopting theſe, he has increaſed the ſalutary effects of his invaluable tea. From reading Hippocrates, Dioſcorides, and Galen, he found the ancients derived all their knowledge of plants by their taſte and ſmell. With theſe examples before him, and his own propenſity to the ſtudy, joined to his penetrating judgement, it is no wonder he ſhould have ſo well ſucceeded. Thus he recurred to the original mode of inquiry, which firſt eſtabliſhed and raiſed the eminence of phyſic; neglecting that deluſive principle of Ariſtotle's

ſtotle's philoſophy, which has ſince taught too many phyſicians to expreſs the virtues of medicines by hot, cold, moiſt, and dry, without deriving the leaſt information from their ſenſes, Dr. Solander, aided by chemical analyſis, diſtinguiſhed the virtue by the taſte or odour of every plant. By this means their ſpecific juices he found taſted either earthy, mucilaginous, ſweet, bitter, aromatic, fetid, acrid, or corroſive. From this experience he found the obſervation of ſome botaniſts to be true, "That there is no virtue "yet known in plants but what depends on the taſte "and ſmell, and may be known by them*. With this infallible means of purſuing his inquiry, he formed a tea compoſed of herbs that are in their nature aſtringent, balſamic, aromatic, cephalic, and diaphoretic. Theſe virtues combined may be ſaid to form one of the moſt incomparable ſpecifics, as a nutritive and reſtoring aliment, that has been diſcovered.

In the aſtringent, the acid fixing upon the more earthy parts, the nutritious oil is more eaſily ſeparated, which renders them alſo pectoral, cleanſing, and diuretic. This part of the tea is in its nature particularly ſerviceable in all caſes where vulnerary medicines are requiſite. They particularly amend the acid in the nervous juice, and thus reſtore the equal motion of the ſpirits, which were obſtructed or retarded by ſpaſms or convulſions. By the volatile oil and volatile pungent ſalt, obſtructions are opened, and the motions of the languid blood increaſed to a healthy degree of circulation. They reſolve coagulated phlegm in the ſtomach, preſerve the fluidity of the juices, and promote digeſtion, by aſſiſting the bile in its operation.

And with regard to their balſamic and aromatic nature, theſe qualities warm the ſtomach and expel wind, by rarefying the flatuous exhalations from the

 chyle

* Floyer, Malpighius, Epew, Harvey, Willis, Lower, Needham, Gliſſon, &c.

chyle in the prima viæ. Theſe, by their ſweetneſs, allay the ſharpneſs of rheums, and lenify their acrimony. Being filled with an oily ſalt, they open the paſſages of the lungs and kidnies. By opening the pores, they extraordinarily diſcuſs outward tumours, and attenuate the internal coagulation. All theſe virtues may be ſaid to be derived from the union of their balſamic oil and volatile ſalt.

By a ſecond claſs of aromatics, with which Dr. Solander compoſed this ſanative tea, is ſuch as have a bitter aſtringency joined to their volatile oil and ſalt. Theſe united qualities correct acids in the ſtomach, cleanſe the lungs, and open obſtructions in the glands cauſed by coagulated ſerum; and the ſaline pungent oil altering the acids in the glands of the brain, by correcting and attenuating its lympha and ſuccus nervoſus, produces the ſame effect; for the lympha and nervous juice are, like all other glandulous humours, liable to acidity and ſtagnation; therefore theſe aromatics, by exciting their motion and correcting their acidities, render the liquids of the nerves more volatile, and are therefore juſtly termed cephalics. And as it is the property of volatiles to aſcend, the reaſon is evident of the brain being aſſiſted by their ſalutary qualities. Theſe aromatics likewiſe evacuate ſerum from the blood, promote its circulation, and attenuate the coagulations of chyle, lympha, and ſuccus nervoſus. And here it is proper to add, that all aromatics, by rarefying the blood, are cordial. There being aromatic aſtringents in this tea, its infuſion ſtrengthens the fibres and membranes of the ſtomach, and all the nervous ſyſtem, in ſuch a manner as not to deſtroy their tenſity by that too great contraction cauſed by the foreign teas; and, having no acid in their aſtringency, the blood is preſerved from too great a rarefaction, which would otherwiſe happen from the pungency of their oily qualities. Theſe alſo excite the appetite, by ſtimulating the natural pro-

greſs

greſs of the chyle, and thus prevent its too rapid fermentation of its ſpirituous parts into windy flatulencies. For the ſame reaſon vinegar is taken with hot meats and herbs. Having mentioned vinegar, it may not be improper to ſtate this vegetable acid is the beſt antidote againſt the poiſon of any acrid herbs. That part of the tea which has a mucilaginous taſte is inwardly cooler than oil, although it be different in nature. Such herbs defend the throat from the ſharpneſs of rheums, the ſtomach from corroſive humours of diſeaſe or acrimonious medicines, the ureters from ſharp, choleric, or acid urine, and lubricate the paſſages for the ſtony gravel. Their crude parts cool the heat of ſcorbutic blood, leſſen its violent motion, and ſheathe its acrid ſaline particles.

By their different mucilaginous principles, they produce the following various ſalutary effects:

The earthy repel and cool outward inflammations.

The watery, which is thick and gummoſe, ſtop fluxes and correct ſharp humours.

Thoſe of an oily odour alleviate pains.

Thoſe of a pungent acrid diſſolve tartareous concretions in the kidnies.

From theſe and a variety of other ſalutary properties, it is evident the general nature of Dr. Solander's tea is ſuch as to correct acrid humours, promote the ſecretions, reſtore the equilibrium between the fluids and ſolids, and finally to brace every part of the relaxed nervous ſyſtem. The body being thus relieved from obſtructions, its circulations reſtored, the digeſtive faculties invigorated, and the ſpirits reanimated, the debilitated conſtitution is reinſtated in all its enjoyments of health and hilarity. It may be therefore obſerved, that the principle of this tea is to nouriſh as a general aliment, while it renovates the human conſtitution, without having recourſe to the nauſeous potions of galenical preparation, or the hazardous trial of chalybeate waters. As this tea is particularly

ſalutary in all caſes where mineral waters are generally recommended, it is very proper the Public ſhould be cautioned againſt the danger which too frequently attends the conſtant drinking of them.

Chalybeate waters, it muſt be acknowledged, have effected very extraordinary cures in certain caſes. But when ſo great an author as Helmont ſays, that ſuch waters are fatal to all thoſe who are afflicted with peripneumonic complaints, it is ſurely neceſſary they ſhould be reſorted to with the greateſt caution; and even in complaints where they may be ſerviceable, it is neceſſary to obſerve whether they really poſſeſs thoſe chalybeate qualities for which they are commended. Thoſe who have written upon their virtues aſſert, and with ſeeming propriety, that where they depoſit an ochreous ſediment, they are certainly diſpoſſeſſed of their ſteely virtues; for ochre being no other than the calx of iron, ſuch a reſidue evinces the evaporation of the more eminent properties of the chalybeate, by the phlogiſton of the mineral eſcaping by its extreme volatility. Every metal deprived of this igneous principle is immediately reduced to a calx, and thus deprived of its ſplendour, fuſibility, and other properties, until reſtored again by the re-admiſſion of its phlogiſton. Calcined lead having loſt this inflammable quality, is reduced to a red calx or mineral earth, which, if fluxed with any igneous body, ſuch as oil, pitch, wax, fat, wood, bone, or mineral oil or bitumen, the fiery principle is reſorbed, and the lead reſtored to its eſſential qualities; from theſe phyſical obſervations the reader may be convinced of thoſe mineral waters as afford ſuch a ſediment being in a ſtate of decompoſition. They are thus deprived of one of the four elements or principles of which they are all more or leſs compoſed. Every analyſis of mineral waters in their perfect ſtate has demonſtrated that they poſſeſs a fixed air, a volatile alkali, a volatile vitriolic acid, and the phlogiſton. If, there-

fore

fore, either of theſe eſſential qualities is evaporated or corrupted, the water being in a ſtate of decompoſition, muſt loſe the virtues of a medicinal chalybeate.

It is only neceſſary to add a few further remarks, in order to ſhew in what particular complaints chalybeates, even in their moſt perfect ſtate, are pernicious. By this means many of the diſeaſed will be guarded againſt a fatal error: and as the prejudice in favour of ſuch applications is ſo univerſally prevalent, it is hoped a few pages allotted to this ſubject will be deemed a moſt eſſential ſervice to a deluded community. By removing ſuch a pernicious partiality, the health, if not the lives of thouſands, may be ſaved, to the great enjoyment of themſelves and their relatives. Dr. Knight ſays very juſtly, "that the explication of the manner of the operation of chalybeate medicines in human bodies is grounded upon falſe principles, and not matters of fact; to wit, that all chalybeate preparations, in a liquid form, owe their medicinal efficacy to the metal diſſolved, whether in an aqueous or ſpirituous menſtruum, retaining its metallic texture." To avoid entering into the whole detail of this intereſting argument, it is only here ſtated in ſupport of the above aſſertion, that as mineral waters are impregnated with a combination of ſulphurs, ſalts, and earth, their virtues cannot be properly aſcribed, as they have been, to the metals which they contain. It might be further proved, that iron cannot poſſibly enter the blood, retaining its eſſential qualities; for metals in general, except mercury, are ſuſpended in liquids in *ſolutis principiis*, or principles diſengaged, which are thus deprived of their metallic properties. Iron, entering the body as a volatile vitriolic acid, cannot act by its ſpecific gravity as mercury does; it therefore acts *per accidens*, and not *per ſe*. But admitting that waters, however impregnated with iron, are efficacious in checking all

diarrhœa and other profuſe evacuations, by cloſing the relaxed veſſels, and incraſſating the fluids, yet as they prove ſometimes ſo aſtringent as to ſtop the natural ſecretions, the conſequences are frequently cramps, dangerous convulſions, which often end in fevers, inflammations, and mortifications, their indiſcriminate uſe ſhould be moſt cautiouſly avoided. Chalybeates, thus contracting the leaſt pervious glands, ſhould not be taken in acute inflammations, or in any complaints that are attended with a quick and ſtrong pulſe, a plethora, or extravaſation of humours. They are equally dangerous in all nervous contractions, or where the blood is got into the arteriolæ, or capillary veſſels. Thus, inſtead of acting like the ſanative tea, which ſoftens, ſmooths, and unbends the too conſtringed fibres, the vitriolic ſalts of this mineral water but more contracts the fibrillæ, by operating like ſo many wedges, which ultimately tear, rend, or divide the tender filaments. It muſt, however, be admitted that mineral waters are very beneficial in cachexies, ſcurvies, jaundice, hypochondriacal and hyſterical affections. Having paid this tribute to their virtues, it is evident that what is above ſtated reſpecting their pernicious effects has been dictated by candour, and with no illiberal diſpoſition to deny their abſolute virtues *. Theſe few remarks have only been made in order to warn the community againſt a prevailing and indiſcriminate uſe which might otherwiſe, in many complaints, prove at leaſt fatal to their health, if not to their exiſtence. And as the tea diſcovered by Dr. Solander poſſeſſes all the virtues of the chalybeate, without its dangerous principles, it was an immediate duty not only to warn but to direct the Public in their adop-

* Waters drank at their ſource are efficacious in many complaints that are not accompanied with inflammatory ſymptoms; but if they are drank after a long or ſhort conveyance, their effects muſt be proportionably injurious inſtead of beneficial.

adoption of an aliment ſo eſſential to their health, and conſequently temporal happineſs.

PREPARATION.

As the native and exotic herbs of this tea are dried in a pure air, without any artificial means of preparation to improve their colour or increaſe their natural aſtringency, they muſt be free from thoſe deleterious, corroſive, and violent contractive effects with which we have obſerved the general and indiſcriminate uſe of foreign teas and mineral waters are attended. In the firſt part of this Eſſay, it was ſtated that foreign teas were dried upon iron, and thus produced thoſe aſtringent effects we have ſeen to characteriſe chalybeate waters. It is therefore evident, that the ſimple preparation of theſe ſalutary herbs being free from what renders teas and mineral waters in many caſes pernicious, muſt leave their qualities pure and unadulterated, according to the intent and principle of nature in their production. They are, therefore, found particularly free from thoſe injurious properties which render green tea ſo deſtructive to emaciated conſtitutions. Inſtead of being, like the above foreign tea, hurtful to thoſe worn down by a long fever, or ſuch as have weak and delicate ſtomachs, their qualities are in ſuch complaints eſſentially nutritious and reſtorative. That ſtimulating roughneſs which foreign teas imbibe from their iron preparation, is not to be found in the ſanative tea diſcovered by Dr. Solander; the latter is therefore very beneficial where the mucous coat of the bowels is very thin, or the ramification of the nerves numerous, extenſive, and exquiſitely ſenſible of impreſſion. The cholic, gripes, or painful prickings of the nervous coat by the India teas are allayed by the drinking of the ſanative tea, from its tepid and lubricating nature not being perverted by any corroſive preparation. To thin and meagre bodies, which are greatly affected by green

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and bohea teas, the above is a moſt reſtorative aliment. The atrophy and diabetes, ſo frequently cauſed by the foreign teas, are, from the herbs of Dr. Solander's tea poſſeſſing their natural nutritious qualities uncontaminated by metallic preparation, often cured by uſing it as a morning and evening beverage; and the depreſſion of ſpirits occaſioned by green and bohea, and which induces many of its drinkers to take ſal volatile or ſpirits of hartſhorn, is avoided by the ſanative tea; for the latter is found one of the greateſt and moſt ſalutary exhilarators of the nervous ſyſtem. And thus thoſe who drink it as a conſtant aliment, are ſaved from the dangers that attend rendering the blood too thin by the uſe of the above volatile alkalies or drams, which are too frequently taken to avoid that lowneſs of ſpirits cauſed by the great, ſudden, and violent contraction of the nervous fibrillæ. As the inconveniencies of the foreign teas ariſe from the metallic properties derived from their preparation, the advantages of the ſanative tea are evidently ſeen to ariſe from the preparation being ſuch as leaves every herb poſſeſſed of its natural and eſſential quality. This clearly evincing the ſuperiority of Dr. Solander's tea to every other herbal beverage, it only remains to proceed to the two remaining inquiries reſpecting the mode of uſing, and the effects of this ſalutary combination of vegetables. The next ſubject, therefore, of inveſtigation is the

MANNER OF USING.

As the time of drinking this tea is morning and evening, it is neceſſary to inquire whether its qualities are ſuch as are calculated to ſuit the temporary neceſſities of nature at thoſe periods. From what has been obſerved, reſpecting foreign teas, it is evident that their properties are diametrically oppoſite to thoſe which nature at ſuch times requires. When the body is exhauſted by inſenſible perſpiration, the moſt requiſite

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aliment is that which can equally reſtore the loſs of the ſolids, and the languid flow of the animal ſpirits. What is then taken ought therefore to be neither too heavy for the ſtate of the unbraced ſyſtem, nor too volatile to afford a ſufficient quantity of nutritive juices to the whole animal economy. Nor ſhould the aliment be ſo ſtimulating as to diſorder inſtead of re-eſtabliſhing the equalized motion of the yet perturbed ſtate of the animal ſpirits. What is then given ſhould have the power of ſedating the nervous fluids, while it diſſeminates through the viſcera the elements of nutrition. Theſe being the requiſite properties of what is taken as a breakfaſt, it remains to conſider whether thoſe of the ſanative tea are adequate to ſuch indiſpenſible purpoſes.

In the preceding part of this inquiry, it has been found that the principal qualities of this tea are moderately aſtringent, balſamic, and aromatic; it is therefore evident, that from a combination of theſe eminent medical principles, this tea muſt operate as a ſedator of perturbation, a renovator of exhauſted ſolids, and an exhilarator of nervous depreſſion. They may therefore be uſed as a morning beverage with the greateſt advantage, for the preſervation and re-eſtabliſhment of health; for never were the qualities of any aliment ſo particularly adapted to the neceſſities of the body at any ſtated period, as thoſe of the ſanative tea are at the time of breakfaſt. Without loading the exhauſted viſcera, they afford it a ſufficiency of balſamic and nutritive aliment; nor does the ſanative tea, by ſedating the fluttering ſpirits, deſtroy their vigour; but, on the contrary, by calming their motion, they contribute more active energy by promoting their equalized progreſs, and thus is the animal economy reſtored to the proper uſe and enjoyment of its functions. And in proportion as the ſpirits are reſtored to an equilibrium of motion and fluidity, the relaxed tone of the nerves is recovered, and the whole functions

tions of man rendered capable of exercise and enjoyment.

The above being stated as the advantages attending the use of the sanative tea in the morning, it is next expedient to consider what benefit is derived from the use of it in the afternoon.

At this time the body is in a very different state of temperature from that of the morning. By the toil, care, study, or amusement of the former part of the day, the solids are wasted, and the fluids in a state of ferment and evaporation. Added to this, the aliment which is taken at dinner time so exhausts the animal warmth, as to leave the whole body in a state of refrigeration. What is therefore taken in this situation, should be neither relaxing, constipating, nor heating; it should possess a genial warmth, a cordial assistant, and a restorative nutriment. The first should be such as to supply the deficiency of warmth which the body feels by the act of digestion, without inflaming the blood, or too greatly increasing the pulse. The second, or cordial assistant, should rather increase the powers of the body than those of the heart; for the force of the heart may be increased to the detriment of health. This is evident from a weakness of the body being the consequence of the force of the heart being increased in an inflammatory fever. And with regard to what is taken in the afternoon requiring a restorative nutriment, it is necessary that it should be light, pure, and wholesome, lest its solidity and heaviness should oppress the bowels at a time when their tone is relaxed by recent fatigue and digestion. These qualities being the most proper to produce fresh animal spirits, are the most fit to be taken when a new accession of them is necessary. It has been observed those are the most robust whose serum resembles most the white of an egg. It has therefore been most rationally concluded, that the origin of the animal spirits is from aliments capable of being changed into a simi-

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lar ſubſtance, but ſo attenuated by incalation as concrete by fire. For this reaſon, the greateſt ſupport of the ſpirit is afforded by light and nouriſhing meats and drinks, which in taſte and ſmell are even agreeable to infants. All cordials and aromatics are conſequently the moſt proper for ſuch purpoſes, and at ſuch times when heavier foods would impreſs inſtead of recruiting the exhauſted ſolids and fluids. It is therefore Boerhaave recommends ſuch aromatics, for the reviving and recruiting the animal ſpirits, as have the moſt pleaſant taſte and ſmell. Agreeably to this opinion, Dr. Solander employed his reſearches to form an afternoon beverage of ſuch herbs as ſhould poſſeſs all the above cardiac and balſamic qualities. The uſe of the ſanative tea between dinner and ſupper operates as the moſt reviving and wholeſome aliment that can, at ſuch a time, be poſſibly taken. An enquiry having been made into the nature, preparation, and manner of uſing the ſanative tea, there only remains to conclude this Second Part of the Eſſay with the conſideration of its

EFFECTS.

From the view that has been taken of the nature, preparation, and manner of uſing, the ſalutary effects are moſt clearly and eaſily to be aſcertained. As the baſis of this tea is the combined principle of the moſt balſamic oils, nutritious ſalts, and animating ſulphurs, which the vegetable world produces, their effects muſt be proportionably ſalutary. And as their combination is ſuch as to correct the pernicious qualities of each other, their conjoint effect muſt be the moſt wholeſome that can poſſibly be adminiſtered for the health of human nature. As every ſimple, however ſpecific in certain caſes, poſſeſſes qualities that are pernicious in other reſpects, it has been the firſt principle of phyſical enquiry not only to find the baſis of a medicine, but to form compounds or ingredients that corrected

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the injurious tendency of each other. With this ſcientific prineiple, Dr. Solander having compoſed his ſanative tea, has rendered it the moſt general ſpecific in its effects of any medicinal aliment.

This tea, affording a compound oil, which is formed of the moſt aromatic vegetables the earth affords, it is no wonder its effects, like honey, ſhould approach ſo near a general ſpecific. The invaluable oils, uniting with the ſulphurs of the ſanative tea, recruit, ſoften, and lubricate the juices. diminiſh the too great elaſticity, dryneſs, and criſpneſs of the nervous fibres, and afford the exhauſted liquids freſh ſupplies. Their effects are conſequently exceedingly reſtorative in all caſes where the force of the fibres and the veſſels are too ſtrong, the circulation too rapid, and the blood too attenuated or diminiſhed. As it prevents the too quick action of the ſolids, and the too rapid motion of the blood, the body is nouriſhed, and the mind prepared for the refreſhment of ſleep when the approach of night invites to repoſe. In ſpitting of blood its effects are particularly beneficial. The oil being eaſily detached from the earth of the plants, is, in ſuch caſes exceedingly nutritive, and, by its checking the ſtimulation and ſheathing the acrimony of the humours, the blood is repleniſhed with the moſt healing and balſamic virtues.

In pleuriſies, ulcers, and abſceſſes of the lungs, hectic fevers, dry coughs, night ſweats, and difficulty of breathing, the balſamic oil and ſulphur of this tea is moſt ſalutary.

The dropſical, phlegmatic, corpulent, cathetic, and all ſuch as are, in their ſtamina, relaxed, will find the greateſt relief in its conſtant uſe; and to thoſe who are emaciated, either from hereditary or acquired diſeaſe it is particularly beneficial.

In ſeaſons, when experience informs us that the blood requires cleanſing and attenuating, this tea will be of conſiderable ſervice to the healthy as well as the di-

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ſeaſed. By this means, the conſtitution will be preſerved and reſtored from all thoſe chronic and acute afflictions which are the conſequences of acrimonious humours and foulneſs of blood.

As this tea produces the effects of cleanſing the ſtomach, promoting digeſtion, diluting the chyle, and invigorating the whole viſcera, it ſhould be conſtantly drank by thoſe who live freely.

Unlike moſt medicinal applications, this tea requires no previous preparation of the body. Such are its nature and progreſſion of effects, that it firſt renders the body in a ſtate ſuitable to receive ſucceeding benefits; nor is it dangerous, like mineral waters, to which perſons afflicted with nervous complaints generally reſort. Perſons ſuffering acute or inflammatory diſeaſes, or who have their veſſels too greatly conſtringed, need not be under the apprehenſions of ſuffering ſchirruſſes, or even death, which is the conſequence of drinking, in ſuch caſes, mineral waters; but, on the contrary, they may expect to receive, from the uſe of the ſanative tea, the moſt beneficial effects not only in the above, but alſo in the gout and rheumatiſm, from its moderate uſe producing a gentle perſpiration.

To account for the variety of ſalutary effects that this valuable diſcovery produces, we ſhall now proceed to conſider its operation as a medicine and an aliment, which will afford the moſt convincing and concluſive arguments that can be poſſibly adduced in favour of its ſanative qualities.

To conſider its medicinal properties or effects, it is neceſſary to ſtate in what manner it acts firſt upon the ſolids, next upon the fluids, and laſtly, how it operates upon both together; for on theſe three principles the power and quality of a medicine ſolely depend. In acting upon the ſolids, it either alters their texture and coheſion, or, by diluting the canals, change the figure of the ſides. But a medicine acting upon fluids only, either alter their properties, or bring them out of the body.

body. All medicines however act as well upon the ſolids as the fluids; for the latter can ſcarcely be altered without, in ſome degree, affecting the former.

As all medicines derive the greateſt qualities from their filling, evacuating, or altering the ſmalleſt parts, the ſanative tea poſſeſſes the moſt reſtorative properties from its action upon the ſmalleſt nervous veſſels, and not in the arteries, veins, glands, lymphatic, and adipoſe veſſels. Thus, as all augmentation and accretion of the greater entirely depend on the extenſion of the ſmalleſt lateral veſſels, which are nervous tubuli, the nutrition and reſtitution of what is waſted, muſt be conſiderably derived from the conſtant uſe of this beverage morning and evening. From this, the medicinal effects of the tea upon the ſolids are found to be conſiſtent with the firſt of phyſical principles; for the nutrition of the ſolids, which is made by the application of any part to the place of a waſted part, is always effected in the ſmalleſt canals, of which the greater conſiſt.

And as every ſalutary change of the fluids is made in the ſmalleſt veſſels, the ſanative tea poſſeſſing the power of conveying nutrition into the moſt minute channels of the body, the liquids muſt derive from it the greateſt renovation.

From this combined effect upon the ſolids and liquids, the ſtrength of the greater veſſels is increaſed, and thus is the whole aggregate body invigorated; for every artery derives its energy from its ſides, which are compoſed of the minuteſt veſſels. To enter into a complete detail of its medicinal principles, would require a volume itſelf; we muſt therefore avoid any further inquiry of its effects as a phyſical remedy, in order to leave a few pages for its conſideration as an aliment.

The qualities of an aliment chiefly depend in their nature affording that nouriſhment which is proper to the time of taking and the ſtate of the body. Indeed, without

without their poſſeſſing theſe relative properties, either meats or drinks are injurious inſtead of beneficial. For this reaſon, phyſical neceſſity, more than tyrant cuſtom, has cauſed a thinner aliment to be taken in the morning and evening, than what forms the meals of dinner and ſupper. This neceſſity ariſes from the ſtate of the body being in the morning juſt recovering its ſpirits from a comparative ſtate of relaxation and imbecility; and in the afternoon from the ſtomach being enfeebled by recent digeſtion. That the body immediately after ſleep is in a relaxed ſtate, may be perceived by the peturbation the ſpirits experience from any ſurpriſe or violent action inſtantly ſucceeding. Fits and faintings have frequently been the conſequence of perſons of quick ſenſibilities being ſuddenly wakened. In ſuch a ſtate of relative debility, groſs and ſolid food muſt oppreſs the ſpirits, and thus render the body incapable of deriving nouriſhment from ſuch an untimely aliment. But if what is taken is light, pure, and apt for producing chyle, the ſtomach being capable of digeſting it, muſt turn it to the moſt wholeſome nutrition. To attain this end, foreign teas, from their lightneſs, have been univerſally adopted; but as we have found from their nature, how ill adapted they are to be given when the nerves are already too weak to bear their violent aſtringency, ſuch ſhould be uſed as are poſſeſſed of the moſt nutrition. without a tendency to irritate the relaxed fibrillæ.

When the ſtomach is enfeebled by recent digeſtion in the afternoon, to take then another meal of ſolid aliment muſt evidently tend to depreſs the digeſtive powers, and thus prevent the body from having that nouriſhment it might receive from a lighter aliment.

The ſanative tea being found, from the preceding inquiries, to poſſeſs the moſt active, ſubtle, penetrating, and balſamic compound oils, ſalts, and ſulphurs, which pervade, without irritation, the minuteſt canals,

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muſt afford that ſpecies of aliment which the body in a morning and afternoon requires. While it attenuates, it reſtores the tone and ſubſtance of the juices, ſtrengthens the ſolids, invigorates every natural function, and thus affords the means of enjoying all the comfort that a healthy body and a happy mind can beſtow.

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THE END.