

The nature and qualities of Bristol water : illustrated by experiments and observations, with practical reflections on Bath waters, occasionally interspersed / by A. Sutherland.

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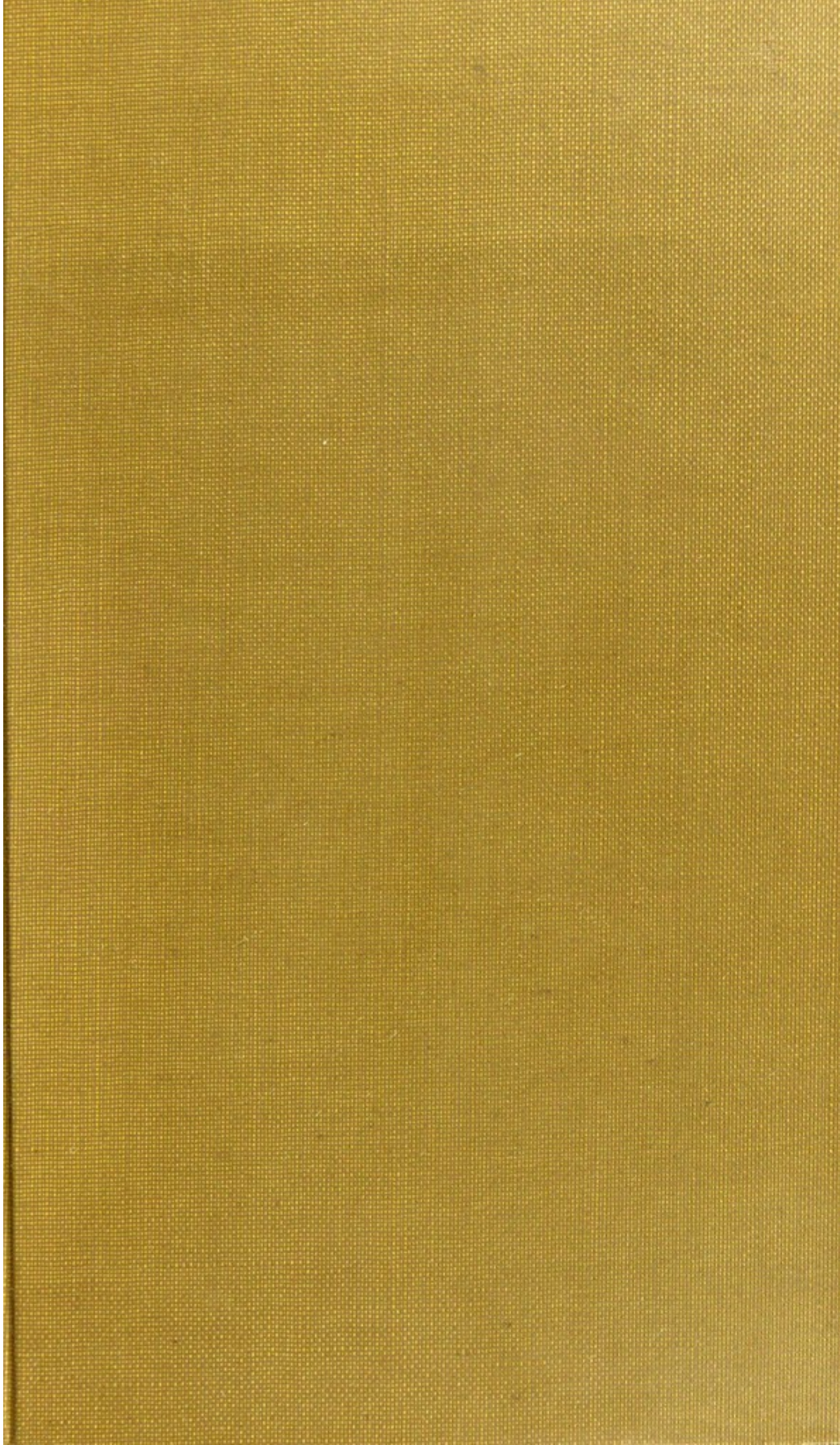
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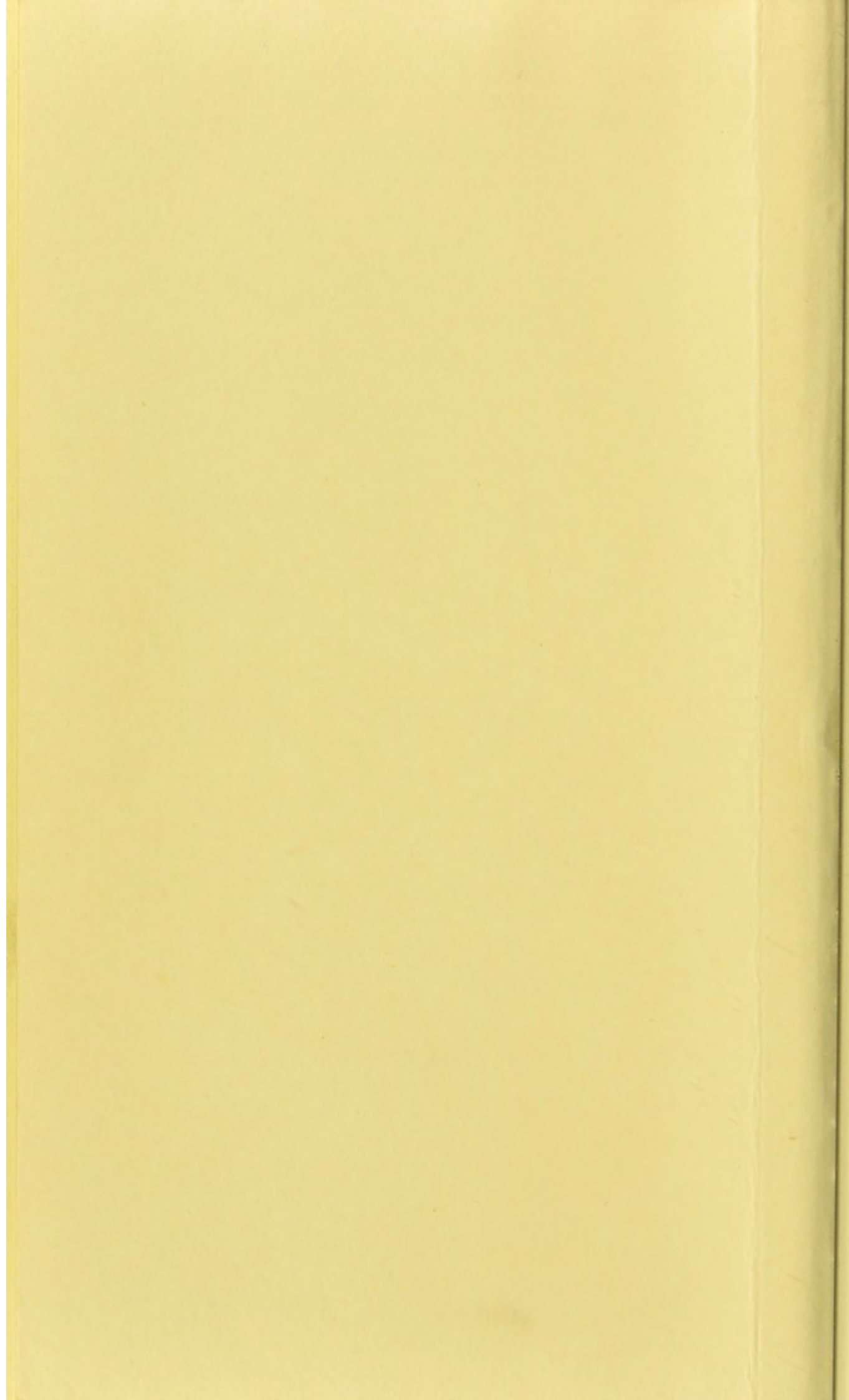
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BRISTOL WATER

PRACTICAL RECIPE

FOR THE


PREPARATION

OF

THE

SAME

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T H E
NATURE and QUALITIES
O F
BRISTOL WATER:

ILLUSTRATED BY
Experiments and Observations,
W I T H
PRACTICAL REFLECTIONS
O N
B A T H W A T E R S,
Occasionally interspersed.

BY THE LATE
A. SUTHERLAND, M. D. of BATH.

A NEW EDITION.

Fronte sub adversâ scopulis pendentibus, Antrum :
Intus Aqua dulces. VIRG. Æneid.

B R I S T O L :

Printed by J. RUDHALL & Co. and sold at the Pump-Room,
Bristol Hot-Wells, and by all the Bookfellers of Bath and
Bristol, 1788.

NATURE and QUALITIES

BRISTOL WATER;

ILLUSTRATED BY

Experiments and Observations,

WITH

PRACTICAL REFLECTIONS

ON

BATH WATER;

Occasionally interspersed.

BY THE LATE

A. GUTHRIE, M.D. of BATH.

A NEW EDITION.

Printed by J. BARNARD, at the Bath Press, in the Strand, near the Temple Church.

B R I S T O L :

Printed by J. BARNARD, at the Bath Press, in the Strand, near the Temple Church. Sold by all the Booksellers of Bath and Bristol.

TO THE

Most learned and most exemplary,

THE

DOCTORS and PROFESSORS

OF

MEDICINE,

IN THE

UNIVERSITY of *Edinburgh*;

As a Testimony of personal esteem,
as well as Academical gratitude,
this imperfect ESSAY, is humbly
offered,

By the AUTHOR.

T O T H E

Most learned and most exemplary

T H E

Doctors and Professors

M E D I C I N E

I N T H E

University of Edinburgh

As a Testimony of personal este

as well as Academicall gratit

this imperfect Essay, is humb

offered

By Mr. A. L. T. H. O.

ADVERTISEMENT.

EVERY Treatise which has hitherto been published on the *Bristol Hot-Well-Water*, being out of Print, it was thought a Republication of the following Sheets on its Nature and Qualities would not be unacceptable to the Nobility and Gentry, who are recommended to the Use of it.

24th *May*, 1788.

History of Bristol Water	p. 13.
Writers of Bristol Water	-- 18.
Analysis of Bristol Water	- 39.
Cause of Heat in mineral waters	- 65.
Contents of Bristol Water with their virtues	71.
The virtues of Bristol water in the cure of diseases in general	99.
The virtues of Bristol water in particular diseases	- 120.



THE

INTRODUCTION.

VARIOUS have been the Opinions of Writers, on the subject of MINERAL WATERS in general, as well as upon those of *Bristol* in particular. Some, without making one Experiment, have given them Ingredients which they never knew : whilst others, by various Tortures, have destroyed those Principles which Nature gave. Each hath assigned the vain illusions of his fancy for discoveries,

A

and

and each practised according to his prejudice.

To preserve a neutrality, in this case, Dr. SHAW proposes a rational method of coming at the truth, which is not to be learned from the professed Patrons of Mineral Waters, nor from their Antagonists, but from such discreet, and intelligent persons, as endeavour to illustrate the subject by direct Experiments, and Observations.

THUS.-----DR. LESTER, in his Treatise entitled, *Exercitationes due, de Fontibus Anglie medicatis*, has exploded many fictitious Principles, and examined into the effects of medicated Waters, upon drinking.

Mr. BOYLE,

Mr. BOYLE, in his *Memoirs for the Natural History of Mineral Waters*, hath examined their specific Gravities, exposed their Ingredients, and, after enquiring into their Effects, concludes, That Experience must determine best, for, or against, them.

Dr. FREDERICK HOFFMAN, may justly be esteemed the Prince of Enquirers. After a series of years spent in the examinations of WATERS, as a *Naturalist, Chymist and Physician*, he declares them to be the most *innocent*, the most *universal*, and the most *serviceable* of all Medicines.

AFTER a long experience, he ventures to pronounce, that the grand

Secret in Medicine, is to be Master of a few select remedies ; to understand their virtues, to know what they can, and what they cannot do.-----Thus *Damasunus* gave this advice to his Son, “ Let the Remedies, you employ, be few, and certain ; for the use of a multiplicity, so distracts the Senses, that a Physician can safely depend on none.”

FEW understand the powers of the Medicines, which they prescribe ; infinite Volumes are stuffed with the *Materia Medica*, infinitely combined, whose Authors launch out into the high Encomiums of the Virtues of Medicines, which upon trial are found to have none.

MOST

Most Physicians, antient, as well as modern, are ignorant of the Principles of Chymical Philosophy: they prescribe Medicines without a previous knowledge of their virtues: destitute of a sure foundation, they crowd Compositions on Compositions, in such a manner, that if the Patient has the good luck to recover, the Physician is so much at a loss to know to which of the Remedies the cure was due, that, upon a like occasion, he knows not how to employ the same.-----Hence it was, That Lord BACON, very justly, called multiplicity of remedies, the *Child of Ignorance*; and, with great discernment, inflicted a censure on the Practitioners of his days.

THE Principles of Mineral Waters, are only discoverable by Chymistry; every different Water hath its different virtues; as if Providence had, with a liberal hand, dealed out ready, and easy, cures, for all the distempers with which mortals are afflicted.-----Some Waters check the too great excretions; others, again, promote excretions, of all sorts, and some particular ones.---Mineral Waters, besides, have this peculiarity, viz. when common springs are dried up, they have continued to flow the same, as to quantity, strength, and temper-
ture; and that at all seasons of the year. This observation holds true as to Bath Waters, as well as to these.

these. A happy circumstance to the patient, whose disease will not wait for the return of seasons!

SETTING out then with the judicious HOFFMAN for my Guide, I am resolved to take nothing upon trust, nor measure the skill of Physicians by popular opinion. As far as my abilities will carry me, I propose to examine every thing by the rule of reason; to point out a rational administration of these Waters; and thereby, rescue them from that discredit which is oftner due to the ignorance of the administrator, rather than to any real want of virtues in the Waters themselves. Our senses are too gross to comprehend the intricate

scheme of nature; all we know
 must be founded on experiments:
 we may be allowed to reason, so
 long as we pretend not to certain-
 ty, or to pass our opinion for de-
 monstration.----When I reflect on
 those diseases, which have been
 deemed incurable, by men of emi-
 nence, in their profession; when,
 both here, and at Bath, I have seen
 those very Maladies yield to the
 power of the Waters; and that in-
 stantaneously; I have often been
 led to admire the Goodness of Pro-
 vidence, in supplying mankind with
 Remedies, which no art can imitate,
 or Analysis fully investigate.---“*Ma-*
 “ *nifold are thy Works, O LORD! in*
 “ *Wisdom hast Thou made them all.*”

THE



T H E
NATURE *and* QUALITIES
O F
BRISTOL WATER, &c.

C H A P. I.

The HISTORY of BRISTOL WATER.

I N subduing the most stubborn *Hec-*
tical-Heats, and, in restraining the most
colliquative Discharges, so very surprizing
have been the Effects of Bristol Waters;
so many deplorable Objects, have these
salutiferous springs restored to pristine vi-
gour, when the lamp of life seemed almost
extinguished; when the utmost efforts
of

of Art, and Power of Medicine, had been tried in vain; That, now, universally, they challenge the regard of all those who are concerned for the welfare of Society, or the Honour of the healing Art.

THE *Hotwell Water-Spring* rises perpendicularly out of the Rock in the sloping muddy bank of the River AVON; about a Mile below the City of BRISTOL, between high and low-water mark, where the River makes its entrance between those stupendous Cliffs of Rocks, which seem to have been torn assunder by the violence of an Earthquake, or the general Deluge; at the foot of a Cliff, where once stood a Chapel dedicated to St. VINCENT, from which, the Rock and Well, take their Name.

THE Water was, originally, inclosed in a brick cistern. Out of this Cistern came a wooden pipe, which emptied itself into a little pond beneath. In this Pond, People

ple washed their fores. Whenever the Tide rose as high as the Spring, it mixed with it *and fouled it*, for some Hours after.

IT has been computed to discharge about forty Gallons in a Minute.

THE City of BRISTOL in 1691, raised a Wall of stone round the *Well*, higher than the Tide ever rose; but the Weight of such a column of water had well nigh altered the course of the Spring. In 1695, the Merchants' Company granted a building Lease to certain Proprietors, who recovered the Spring, and made a foundation for Pumps, which now raise the Water up thirty Feet high in the centre of a House called the Pump-room; whose thick Wall keeps off the Tide from the Spring. Yet, in spite of all the Art hitherto contrived, it is found, that the high Tides as well as excessive Rains, do mix with the Spring, and foul it, for some Hours after the Tide

is

funk: At which time the Water in the *Well* is not sufficient to counter-balance the weight of the external tide; and this continues till the River Water is all pumped out, and the Well-Water recover its pristine colour and temperament. How this happens, we cannot guess, unless it be, that it penetrates, particularly in dry weather, through some Cliffs of the Rock. The Pumpers however know when to leave off and when to begin.

THE Soil near the Well is, for the most Part fruitful, with a constant Verdure all the Year. The Tops of the Hills called *Downs*, are flat, and covered with a thin dry Turf, upon Lime Stone, producing great Variety of Plants, such as *Heath*, *Eyebright*, *wild Thyme*, *Majoram*, *maiden Hair*, *wild Sage*, *Geraniums*, &c. which breathe forth a pleasant odour, and affords pasture for Cows, Horses, Sheep, and Asses. On these Downs, the company exercise themselves

themselves daily in riding; from whence they command, the beautiful prospect of the ships lying at anchor in Kingroad, of the Bristol channel, and South-Wales, enjoying at the same time the benefit of the sea air, which affords a constant breeze even in the hottest weather, and strengthens and refreshes the lungs.

PROVISIONS of all sorts, are to be had in plenty, during the Summer, which is the season allotted, by custom, for drinking these Waters. Garden Stuff is early, and excellent. There are LODGINGS near the Wells, convenient enough for such as are real Invalids: there are magnificent Lodgings in the beautiful village of CLIFTON, on the top of the hill, for such as have carriages, and whose lungs can bear a keener air.

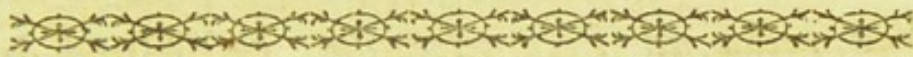
THERE are *Balls* twice a week, and *Card-playing* every night.

THE

THE *River*, is (it is true) muddy, and unseemly at low-water; nor do Fishes, of any value, care to inhabit so filthy a stream. But this is amply made up, by the constant vicissitudes of the tides which purify the air. When the *River* is quite full, the tide is supposed to rise near forty feet, the common tides thirty: and when the ships are carried up and down, by the tide, passing and repassing through the meadows and trees, the prospect is indeed enchanting; especially when the beholder is so situated as to see the rigging of the ships and not the water.

THERE are *Turnpike-Roads* all around, and variety of agreeable rides and fine prospects. Some conveniencies are still wanting, the Road down to the fountain of health, is far from being commodious; there is a shaded parade or walk, at the *Wells* for the Company; though not large enough. The common road is either very
dirty

dirty or very dusty. It is the duty of the Proprietors to remedy those inconveniencies : especially as their Dividends are large from the vast exportation of Water, as well as from the Tenants who rent the Pump and the Well-House.



C H A P. II.

Of the WRITERS on BRISTOL WATERS.

IN 1632 Dr. JORDEN, of *Bath*, published a Discourse on Mineral Waters. He just says enough of these, to convince his readers, that he neither wrote from experience, nor experiments : for he ranks Bristol Water among the Chalybeates.

Mr. JOHNSON, in his *Mercurius Britannicus*, published in the year 1634, says,
 “ He was upon the spot, where, from the
 “ clefts of the rocks, he saw a stream issue
 “ forth, the water of which was pleasant
 fant

“fant to the taste; and was then of some
 “repute, being much commended, for
 “ulcerous and calculous Concretions of
 “the Kidnies; taken inwardly; and for
 “old Sores outwardly.”

Dr. VENNÉR, in the third edition of his
Via recta ad Vitam longam, published in
 1650, has an express Treatise on these Wa-
 ters; in which he tells us, that they re-
 ceive their virtues from *Sulphur* and *Nitre*;
 from one of his patients voiding a black
 stool, he also supposes Iron; and says that
 these Waters were chiefly frequented on
 account of the Stone; that it notably cools
 all inflammations of the inward parts, and
 yet does not offend the stomach; and is,
 withal, of a gentle mundifying quality in
 distempers of the Kidneys. In a word, he
 commends it in all those diseases for which
 it is celebrated even at this day, excepting
 the *Diabates*.

Dr.

Dr. MAPLET practised on the spot. In several letters to his patients, he confirms their virtues in the Stone and Gravel, and in cooling and tempering the blood; and thereby softening the urine. He commends it also in external cancerous ulcers.

FULLER, in his *Worthies* printed 1662, says, “ St. Vincent’s well is soveraign for
 “ sores and sicknesses, outwardly or in-
 “ wardly; that it hath a *rusty ferrugineous*
 “ *taste*, which it retaineth, though boil-
 “ ed never so much.” He commends Beer made of it, for the Spleen; and writes rather like a Collector, than an Examiner.

IN 1690, Dr. GUIDOT published his book *De Thermis Britannicis*, which contains a particular treatise on these Waters. He has collected all that *Venner* and *Maplet*, have said; he commends it in the *Cholic*, *Diarhea*, and particularly, in the *Diabetes*. He makes the virtues of the *Bath*

and *Bristol Waters* synonymous; a plain proof that he was ignorant of both; he wants method, perspicuity, and sagacity: he is tedious without instructing, and argues from chimerical principles. No wonder therefore that he draws conclusions trifling and absurd. He gives them *iron, lime, and a nitro-sulphuric salt.*

IN 1703, Mr. JOHN UNDERHILL, a Practitioner of *Physic* at *Bristol*, published his *Thermologia*. He says, “ It is excellent in
 “ all Cacochymy, Cholic, bilious Vomit-
 “ ings, Cardialgia, Dysenteries, and Fluxes
 “ of all kinds; Fevers, Hectics, Sweatings,
 “ Rheumatic Pains, Herpes, Pustles, Itch,
 “ Scurvy, Inflammations, Ulcers, inward
 “ or outward, Asthma, King’s-Evil, Dy-
 “ fury, Diabetes, and Gravel. He greatly
 “ commends its virtues in *hectic*, and *collig-*
 “ *native* Sweats.” He gives a collection of
 cases, which were formerly collected and
 preserved at the well-house.—Histories of
 diseases, and their cures, fairly, and sen-
 sibly

fibly related, conduce, above all things, to the improvement of the Healing-Art ; and even rude attempts of this kind, ought to be encouraged. To tables of this sort hung up in the temple of *Æsculapius* at *Coos*, it is thought *HIPPOCRATES* owed that discernment, and astonishing skill in Prognosticks, which succeeding Physicians have admired ; but (with all their Improvements) cannot comprehend. Little, it is true, is to be expected from cures related in *Underhill's* manner. Patients labouring under the same disorders may indeed be thereby encouraged to make the like trials ; but the Public is only to be improved from cases fairly, distinctly, and accurately related, in the books of Hospitals, erected by public authority, and endowed by the noble beneficence of the *Great and Opulent* ; one of the principal designs of such endowments is, to instruct Physicians, who want the opportunities of practising, or making experiments on the spot. The Subscribers have a right to ex-

pect journals of every extraordinary case. And, where the Charity is supported by general Donations, Physicians, without distinction, ought to be admitted.—At *Bath*, we have an Infirmary well endowed, and frugally conducted. Physicians have long attended that school of Physic; when their leisure permits, we hope to be favoured with their remarks.—But to proceed:—

Dr. WYNTER, published his *Cylus Metasyncreticus*, in the year 1725, in which he runs a parallel between the *Bath* and *Bristol* Waters; guessing at their contents from their effects, which are deterfive and healing, he ventures to say, that they partake of *Chalk*, *Layus Calcurius*, *Calaminaris*, &c. He pronounces them Specifics in internal *Hemorhages* and *Inflammations*, *purulent Ulcers*, *Consumptions*, *Dropsy*, *Scurvy*, *Stone*, *Gravel*, *Strangury*, and *habitual Gout*, *Rheumatism*, *Diabetes*, *slow Fevers*, and *Atrophy*, *Pox*, *Cancers*, *Gleets* in both sexes, and

and *King's-Evil*. He judges tolerably well, considering he speaks without experience.

THE Authority of Dr. MEAD and Dr. LANE brought them into that Reputation which they since have enjoyed.

Dr. KEIR published his *Enquiry*, in the year 1739 : he has affirmed, that the fixed Salt, obtained from the Residuum, is for the greatest part, *Nitrous* ; his principal argument is drawn from the form into which the Chrystals shoot, when viewed in a Microscope ; but this test is often fallacious : He has given us no proof of its emitting a white flame as *Nitre* does, or fulgurating, while in fusion, by the addition of charcoal powdered. He next supposes a part of the *Lime-Stone* reduced into a powder, by the subtile *Acid* of the Water ; but this is no more than the *calcareous* Earth ; which will be shewn in the Course of Experiments. His book otherwise bespeaks the rational Physician.

Mr. SHEBEARE, *Chymist*, published his *Analysis* in the year 1740. He supposes the Water to contain *Alum* and *Lime* in the act of flaking. But his principles are deduced from analagous Experiments made with solutions of *Alum*, mixed in Lime Water, of the same heat with Bristol Water; he has discovered *no Alum* from the Waters themselves, and his unflaked Lime is nothing more than the calcarious earthy part of the Residuum, calcined into Lime. To use his own words, “ *He despairs of experimental proofs, and would be glad of being allowed probability.*” Had he read Drs. *Alstons* and *Whytt’s* Treatises on Lime-Water, he would have been convinced of the absurdity of his doctrine, for *Lime*, once saturated, is of no farther use; so that, upon his plan, Bristol-Water would have wanted a perpetual recruit of fresh Lime. He conceived, *a priori*, that *Alum* and *Lime* bid fair for curing a *Diabetes*; and therefore he gives them contents which nature has denied.

Dr.

Dr. RANDOLPH, in the year 1750, published his Book, entituled, AN ENQUIRY into the MEDICINAL VIRTUES of BRISTOL-WATER, &c. &c.

IN his Preface (p. 2.) he affirms, “ *That chymical Analysis, is, by no means, the proper method of proceeding in this case, &c.*” He slightly touches upon a few trite Experiments, and proceeds in these words (p. 148.) “ *And thus being left under great uncertainties as to these matters, it may be expected that I should carefully examine into these Experiments, and upon an accurate and exact survey of every particular, endeavour (as much as in me lies) to set things right: but as I despair of discovering any more than those which have gone before me, and think that very little is to be learned from this way of Analysis, I must beg to be excused, giving my reasons why I think all this great labour, and pains, little better than a needless piece of curiosity, Cur tam ridiculum, tam care, prodigus emam?*” — Again, (p. 152.) “ *To what purpose is it to seek,*

where nothing is to be found, and busy ourselves (as Gulliver says) in extracting Sun-beams out of Cucumbers ?”

HE modestly declines a course of *positive* Experiments; and proceeds (p. 153.) to prove *negatively*, what the Waters are not. And here he, finding himself unequal to the task, borrows from other Authors two, or three Experiments, and so goes on to convince us, of what no man, in his senses, can doubt of, for half an hour, viz. That *Bristol-Water*, and *Lime-Water*, are two different Things.

SPEAKING OF MEDICAL HISTORIES, he says, (p. 24.) “*Thus we see, what a medley of conclusions may arise, when people are left to tell their own cases, and those relations are built upon matters of fact.*” The tables which were hung up in the Temple of ÆSCULAPIUS contained Cases which were, I dare say, no better worded than those which Mr. *Underhill* mentions, and whom he condemns, on a *hearsay*. He tells us, “*The Waters*

Waters, like other Medicines, may, sometimes have surprising effects, whilst they, for what we know, may not at all be concerned in the effects." Now, if *they*, i. e. The contents of the Waters do not contribute to the effects; nor the instances of Cures founded on matters of facts, and actually perform'd; how are we to learn what indications they can answer? Suppose I was to see a Patient actually throw up a pint of blood from his lungs, or less or more at different times; or, suppose I never saw this, but received the account from men of probity; and afterwards saw the same person actually cured, if I was assured that this Cure was performed by drinking the *Hotwell-Water*, what is it to me, how the Patient tells his tale? would I not naturally infer that Bristol-Water was good in a *Hæmoptoe*?—In contradiction to all that he advances, he says, *Preface, (p. 3.) "The surest way of knowing them, is by a long, and sufficient Experience of their good and bad effects."*

IN the same page, he tells us, “ *The difficulty of determining the effects of mineral to Waters a priori is little else than insuperable to human Understanding.*” And yet, in a breath, he promises a *Medical History*; a *Catalogue* of those *Diseases*, which they are supposed to *hit*; and lastly, he proposes to examine their *Properties*, so far as they are *discoverable* by *Experiments*. What is all this, but *determining a priori*, a task *insuperable to human understanding*?

PAGE 31. Our *Enquirer* proceeds to call them in one place *cooling* and *drying*, in another *moistening* and *cooling*; *quencking thirst*; *creating appetite*; *giving Flesh*; and *increasing strength*: In the same page, he says, *as to the sensible effects of it, on healthy bodies, they are hardly observable*. In the very same sentence, and without the interruption of a point, he proceeds thus,—“ *it generally creates appetite, provokes a limpid urine, is apt to get up into the head, as also to bind the body; and, if taken in too great a quantity*
chills

chills the stomach and bowels, and sometimes swells the legs." The only chapter, worthy the notice of a physician, is *that* on the Disorders of the Urinary Passages; for which he is obliged to Dr. *Fred. Hoffman*. The remainder of this part can be equalled by no performance that I know of, excepting an Essay on the *Bath Waters* wrote by himself; an original in its kind, which he divides into three chapters. The first of which he omits, as being, *in his own words*, more *properly* the business of an *Historian*. The second (which contains the Diseases which are to be relieved by the Waters) he runs over, without mentioning his subject once; except in the title; and the third, which was to contain the virtues of *Bath Waters*, he purposely omits as the subject of a future enquiry: which, will hardly be expected by any person, who casts his eye on Dr. *Lucas's* short Commentary on this pamphlet, in his analysis of *Bath Waters*, to which I beg leave to refer the reader.

Who can forbear to laugh at his strange notions of the *Ingesta* and *Egesta*, p. 33?—Of the *superfluous Humidity of the Blood*.—Of *Heats* being the most obvious, and common, *cause* of fevers; declaring in the same breath, that fevers are not the consequence of *heat*.—Of bodies being subject to *two* fevers at *once*, p. 37.—Of the *cure* of the *cause* of diseases, p. 45, where he talks of *stimulating* fluids, and *heating* of solids.

THE third and last part treats of the *nature* of *Bristol Water*, p. 158, he has these words, “*But now I shall proceed to consider the water in another light, and endeavour to be a little more instructive.*” High time it is!—Let us, now, see how he keeps his promise. After this declaration, would not one naturally expect to read something satisfactory in regard to the medicinal virtues of the waters? He forsakes his plan, and begins by violently attacking those writers, who maintain the *springs* come from *rain*; and after puzzling his readers with the cramp words

words *Vegetation, Evaporation, Hydrostatics, Æquator, Diameter, Mountains, Hills, Plants, &c.* he plunges them all head-long into the great ABYSS. His words are these (page 163) “*I think I have greater authority than any philosopher, to be of a contrary opinion; I shall proceed upon the old doctrine of an ABYSS in the center of the earth, and water coming from thence, against all the laws of Hydrostatics; declarative of the Almighty hand, which has so ordered it. I do not mean, that GOD is here the immediate agent; but that it is performed by natural causes, far beyond the reach of what is to be learned from Hydrostatics. And here, I cannot but take notice of the modern way of explaining the grand operations of nature, by the common mechanical principles established in arts and sciences; and from these low-limited appearances, accounting for the most wonderful Phænomena in nature, and so giving laws to GOD, instead of Glory.*”

To be still a little more *instructive*, he
presents

presents his readers with *Reflessioni supra l'Origine della Fontana, Cicero de Finibus, Homer and Plato* What a pity it is that *Ovid* did not just then whisper into his ear,—

*Nat Lupus inter Oves, fulvos vehit UNDA Leonos,
UNDA vehit Tigres, &c.———*

Would not UNDA have been a fine word for his ABYSS?

To account for the *equable heat*, and *impregnation* of his Waters, he refers us to mount *Ætna* and *Vesuvius*; those he calls (*in his own stile*) *dry vent-holes*; these *watry vent-holes*; he supposes some cavern or *Abyss*, in which he keeps heated air, for impregnating his Waters; and conceiving he had made a discovery, draws three *profound Corollaries*. 1. That the virtues of Mineral waters greatly depend on their volatile parts. 2. The difficulty of imitating such waters, and 3. Their superiority to medicines.

“ *It is now high time* (continues our author) *to make some application of this impregnated air to Bristol Water. What impregnates*
this

this air, I pretend not to say: and therefore have taken a different method of declaring my sentiments upon it; chusing rather to enquire into its virtues, than its principles. A fine thought indeed! and thus having finished what I had to say, I shall conclude with observing, that as the parts of animals and vegetables bear witness to the scripture account of the Deluge; so, Mineral Waters, which cannot be explained, without a circulation of water from beneath, upwards, seem a standing evidence of the truth of Holy Writ, in regard to what it says concerning the blessings of the deep, against those Naturalists who teach that all Springs are from Rain only; and so pronounce on God's works, without attending to his word."

Let us now take a view of his Modesty.
 "My design has been to acquaint Physicians at a distance, with the true virtues of Bristol Waters. Were there any thing extant on the subject, that gave me satisfaction, I should have spared myself this trouble; but, when I found, that the books wrote for this purpose, were very de-

deficient ; and as I was settled in this place, and owed my life in great measure to this water, I thought it might be commendable in me, to employ my leisure hours upon a subject, in which my busy ones were like to be so very conversant. I know the world too well, to commence author out of vanity this way. Let my readers accept of this as a *Tabula Votiva*, given out in acknowledgment of the escape I have had; the thing speaks itself." To pursue the errors and absurdities of this performance, which the author modestly calls *complete*, would take up a volume larger than the performance itself; let it suffice in general, to affirm, that thro' the whole, he rather obscures than unravels the secrets of nature ; he neither informs the physician, nor amuses the reader. Instead of exposing the errors of former authors by a regular course of experiments, (with his *usual* academical pride) he condemns them in the lump ; with other physicians, they partake of that arrogance peculiar to himself ; and which gives him a title to the advice of a great poet :

“ Launch

- “ Launch not beyond your depth, but be
discreet,
 “ Mark well the point where Sense and
 Dulness meet.”

THE Experiments which Dr. LUCAS has made on these Waters, speak the Chymist, as well as the Enquirer. From a comparative Analysis, between the Waters of *Bath*, and these, he makes the principal difference arise from the small portion of *Iron* contained in the former, and makes a conclusion, which is confirmed by Experience, viz. That the Bath Waters possess all the Virtues of Bristol Waters, and in a higher degree; such a degree indeed, as would render them fatal, where the last prove salutary. *Bath Water* is a warm, subacid, chalybeate Water, rendered deterfive, and aperitive, by a native, neutral Bitter, and a muriatic Salt. It must relieve all disorders which arise from the reverse of Acids; *Choler, Bile,* or an *Alcalescency* of the Juices,

the feverish Commotions being previously allayed. And here, while we wonder at that amazing Chymistry of Nature, which renders Waters in general of such efficacy, we may, at the same time, blush for our own ignorance, when we take a survey of our most consummate Labours compared to these.—As a proof of this, We find that a pint of Bath Water, contains *only* $\frac{1}{38}$ th of a grain of *Iron*, 7 grains *Earth*, 10 grains of a mixed *Salt*, all united in a *Fluid*, heated twenty degrees above the blood of Man in a healthy state. Those Effects, which this mixture of *natural* Pharmacy produces, are so much superior to the utmost stretches of Medical-Art, that we may wonder indeed; and thus, wonder may be still turned into greater, when we consider a fact which is daily experienced, viz. “ Let Water be drank out of an *Antimonial Cup* never so long, it will continue to vomit; and yet, weigh the cup, it will be found to have lost none of its weight.”

THE



T H E
A N A L Y S I S
O F
BRISTOL WATER.

C H A P. III.

SOME Writers have affirmed, that these Waters are impregnated with *Iron*; some, with *Alum*; some with *Lime*, &c. whilst Others have aver'd, that they are the most *simple* Waters in the Universe.

IT is a matter of some consequence to the Public, that these Disputes should be cleared up. It is, particularly, incumbent on those who pretend to direct their Use, to

make themselves acquainted, not only with their constituent parts, but also with their effects on Individuals, in different Diseases, and on different Constitutions; the first of these is to be learned from *Analysis*; the second from Experience.

SUCH an *Enquiry* will enable the Physician to select a few well-chosen Medicines; such as will not jar with the *Principles* contained in the Waters, but rather add to their Virtues. Such a Practitioner will be able to do honour to his Profession and justice to a Medicine, inimitable by Art; he will rescue his Patient from the necessity of throwing himself into the hands of the Ignorant: for, he who prescribes a medicine, upon a supposition that the Waters contain Principles, which they really do not, hazards the health, as well as the life, of his Patient; and is justly chargeable with Empiricism; which is neither more, nor less, than acting irrationally.

THIS

THIS Water, like many others, and perhaps, more so than some (by its transparency) appears to the eye, as one simple, homogeneous Fluid; but Experiments demonstrate, what our Senses cannot discover, viz. that Water is capable of dissolving, and suspending, the hardest Bodies, as well as the heaviest Minerals.

LET the *vain and artful* Pretender impose upon the *ignorant*, let him jumble together Mixtures which abhor an union; let him (to avoid the scorn of apprentices) copy from Dispensatories. To gain his end, let him turn credulity into Gold.—The Man who has arrived at the Honours of his Profession, by a proper gradation of Knowledge, scorns such mean arts; he fears not the censures of Inferiors in the Art; he has turned it into a *complete* Science; while he labours for the recovery of his Patient, he feels his breast glow with the beams of Philosophy, every Cure is a proposition demonstrated. To give up the task of investigating Truth, favours of

Indolence, not to say worse; for as we can reason only from what we know, it is our duty to follow the track of Reason, as far as Knowledge enables us to pursue her Paths.

WATERS are sometimes found serviceable, where they were not indicated. Cures have been performed by the mixture of Medicines, which contradict their Principles; when such Cases are properly ascertained, when we have no longer reason to doubt the Facts, we are to pursue the road of OBSERVATION; even in contradiction to HYPOTHESIS, we are to consider that Chymical Analysis differs widely from the Operations of Nature. We cannot imitate the *Gastric Juices*, the *acidity* of the waters may be assisted by a latent *acidity* in the Stomach, so far as to neutralize an alkaline Medicine, and thereby perform the very Cure which was wanted; Obstinacy in such cases proceeds from a vain Opinion, that the Chymistry of Nature ought to bend to our imperfect Discoveries.

To

To illustrate this by Example, Dr. *Lucas* has fairly discovered that *Bath Waters* decompose *Soap*. He infers, that “*simple water may be as well taken for the basis of the course, and so compounded at pleasure.*” He gives this caution, “*Let the Soap-mongers hence learn, not to counteract their boasted Agent.*” — But Experience is against him; for various Cases of obstructed Livers come to *Bath*, Patients have taken all sorts of Deobstruents at home, duly administer’d, with *Soap* in great quantities, and have not found their Cure; yet, in their common regimen, they must have used simple Water enough: Such patients have come to *Bath*, they have drank the Waters alone, the Waters have heated them, and exasperated their other Symptoms, they have not been able to carry off that *yellow tinge* which is the constant attendant on an obstructed Liver, they have been obliged to leave off the Waters. *Soap* has been administered together with the Waters, and the Patient found immediate relief, the Symp-

toms have vanished, and complete cures have been performed. These Patients have returned, have relapsed, have been judiciously treated, *Soap* has again been given at home, and to no purpose; they have come back to *Bath*, have again tried the Waters by themselves, without effect. *Soap* has again been added, and a speedy cure obtained. The truth of this general assertion, will be confirmed by every Physician, who has been truly conversant with the Waters.

THE Lady's case related in the sixth chapter, puts this remark beyond dispute.—To this let me add another equally convincing.

“ A Clergyman, sixty years old and up-
 “ wards, of a corpulent habit, and choleric
 “ Disposition, labouring under an inveterate
 “ *Scurvy*, his legs swell'd and hard, with
 “ large, deep and foul Ulcers, wandering
 “ pains, itching, &c. came to *Bath*. He
 “ drank the Waters in too great quantity,
 “ he continued generally in the kitchen of
 “ the King's Bath, sweating and broiling
 for

“ for an hour and a half at a time: I often
 “ told him, that there was danger of throw-
 “ ing an Inflammation upon his Liver, al-
 “ ready vitiated, and obstructed, as is the case
 “ in all scorbutic disorders. He laughed
 “ at my prognostic, scorning the dull beaten
 “ track. I found him, one day, very ill,
 “ with every symptom of a *Jaundice*, rather
 “ black than yellow, with a fixed pain in
 “ the region of the Liver. He was immedi-
 “ ately bled, took a gentle purge of *Senna*,
 “ *Rad, Curcum, Rub Tinctor, Rhubarb, &c.*
 “ which, as is common to people of unsound
 “ livers, operated immoderately; his pulse,
 “ strength, and spirits sunk considerably,
 “ Nature was on the point of yielding; the
 “ symptoms, however, abating, I order’d
 “ him to take two drachms of *Nitre* in a
 “ glass of water, thrice a day; a Medicine,
 “ in this case, greatly recommended by Dr.
 “ HEISTER; I allow’d him to swallow as
 “ much Soap as he pleas’d: I indulg’d him
 “ in the free use of Rum-punch enrich’d
 “ with

“ with Sugar and the juice of Oranges ;
 “ advising him to eat as many as he pleas’d.
 “ His Jaundice vanish’d, and what is extra-
 “ ordinary indeed, his Ulcers, old and ob-
 “ stinate, cicatrised ; he became really a
 “ new man, and continues now (after seven
 “ years) in better health than he had en-
 “ joyed for forty before, with the help of
 “ Lime-water only.”

I was present at Dr. *Lucas's* Experiments ;
 they were accurate and fair. Observations
 and Matters of fact, I would, nevertheless,
 prefer to experiment ; the one speaks truth,
 which is not the less so, because I cannot
 conceive the *Modus operandi* ; the other is
 daily liable to fallacy as well as error.—
 But to proceed,

Mineral Waters are so nicely compound-
 ed by nature, that the most accurate analysis
 can never comprehend the exact proportions
 of their Impregnation ; some parts are vo-
 latile, while others, by the fire and other
 mediums, undergo such changes as never
 existed in the Compound. ONE

ONE of the hand-maids of medical knowledge, then, is *Chymistry*, by the help of which, we are enabled to make certain bodies miscible, and capable of union, which naturally had not the least tendency.—By this, we are also taught the art of separating the most compound mixtures into their original Principles or Contents; and to exhibit each in a disjunct state, to the cognizance of our Senses. To this art then, must we have recourse, in order to ascertain the matter now in dispute, *i. e.* to inform the Public, with precision and truth, what are the constituent parts of these salutary Waters.

THERE are indeed some particulars, which fall under the cognizance of our senses, these I shall mention first :

FAVOURED then, with the assistance of my Friend Dr. BAYLIES, who is Master of a neat experimental Apparatus, as well as a cabinet of the *Materia Medica*, which might claim a place in any University, and which
the

the Owner not only possesses, but also understands. We proceeded in the following manner, at the Pump, and discovered,

1. That BRISTOL-WATER, received in a glass, appears, to the naked eye, colourless, pellucid, and manifestly impregnated with Air, sparkling and bounding through its substance, in the form of little bubbles, as if the whole had been in a ferment. This Air, or elastic matter, appears to be the cause of the intestine motion of the fluid, and of the facility wherewith the globules roll over each other, as also of the Water's keeping unputrified.

2. To the *Taste*, they are particularly pleasant, and soft; leaving a sort of stipticity on the palate.

3. To the *Smell*, they are quite inodorous.

4. To the *Touch*, they are luke-warm only. In *Farenbert's* Thermometer, they raise the Mercury to 76 degrees, after pumping all the day.

WEIGHED

WEIGHED, there is little specific gravity, between them, and distilled Water.

THEY keep well, in Bottles, close stop- ped, losing only a portion of that elastic Air, which evaporates before the bottles can be corked.

BY keeping, they acquire no foulness, as most other Waters do, nor any ill smell.

LET us now see what CHYMISTRY in- forms us.

EXPERIMENT I.

A GLASS of Water, poured upon a few Grains of *Sal. Armoniac*, immediately dis- solved it with a very sensible effervescence.

II.

A FEW drops of *Spir. Sal. Armoniac*, with Lime, dropped into a Glass of Water, at the Pump, produced the same effect, as the former.

III.

A SOLUTION of *Sal. Tartar*, or any fixed alkaline Salt, liquified by the moisture of the
Air,

Air, or the addition of a small quantity of distilled rain-water, added to the Water, not only produces the same effervescence, as the Volatile Alkalis did, but gives the whole a milkiness; which, on standing, goes off, affording a whitish, light, earthy precipitate, as the milkiness disappears.

IV.

A SOLUTION of *Soap*, dropped into a glass of Water, instantly curdles, and after standing a little while, the surface becomes covered with a greasy substance; the Water underneath, loses its pellucidity, and appears a little milky, or turbid.

V.

To several Glasses of common Water distilled, the several substances mentioned, were added. No perceptible alteration.

VI.

IN some glasses of common water distilled were dropped a few drops of *Spir. Vitrioli*, in others, other Mineral Acids; then were
added, -

added, in one Glass, the Volatile Alkaline Salt; in another, the Volatile Alkaline Spirit; the fixed Alkaline Salt, and solution of Soap. Whence arose the same Appearances as when these last substances were before added to the simple *Bristol Water*.

C O R O L L A R Y.

FROM these several experiments, it is evident, that these Waters do contain an *Acid*; tho' the same is not to be discovered by our Senses. For, by the means of that same *Acid* it is, that in the two first Experiments, the effervescence is produced between the *Acid* of the Waters, and the *Alkaline* principles of the Salt and Spirit. And in the third Experiment, the additional circumstance of the milkiness arises from the fixed Alkaline Solution, attacking the latent *Acid* in the Waters more strongly, than did their calcareous Earth; by means of which, it is no longer dissolvable, but becomes cognizable to our sight, and forms a white precipitate;

cipitate; which, while united with the *Acid* was in a saline state, and consequently soluble in any pure Water.

THUS also in the fourth Experiment, the same cause subsisting, the *Acid* of the Water uniting with the *Alkali* of the *Soap*, the *Oil* is no longer miscible in Water, the *Soap* becomes decomposed, the Alkaline Salt adhering to the *Acid*, the *Oil* swims on the surface in its natural form.

IF the *Bristol Water* be kept, but one day, tho' corked never so close; or if it is made to boil over a Fire, and these Experiments made; neither the Effervescence, nor the Decomposition will follow; but the milkiness represented in the third Experiment will be the same, and the same Precipitate will ensue; for the Effervescence was the effect of the *Acid* of the Waters, which had not dissolved any other body; but the milkiness, and Precipitate, in the third Experiment, is the consequence of a stronger attraction of the *Acid* by the Alkaline Salt added,

added, than that with which it was before united, and inclosed, by the absorbent earth of the Waters; by the destruction of which, the Waters are robbed of their power of dissolving earthy substances.

HENCE it is manifest, that the *Acid* of these Waters is of a *Volatile* nature, and soon escapes; yet is it capable of being fixed by any *earthy alkaline* substance; with which when it meets, it constitutes a *neutral* Salt, similar to what is found in most medicinal springs.

A VARIETY of general experiments might further be made, by the exchanging the colours of different tinctures, with the addition of these Waters. These might also farther illustrate the facts; but as many of those have been found to be fallacious, and tend more to *amuse* than *convince*, I purposely omit them. The foregoing experiments, demonstrate the truth of what they were intended to prove, viz. “That the *Bristol Hotwell-Waters* contain an *Acid*; and that *this Acid is volatile.*”

D

Now,

Now, That *Acids* are not all similar, is well known; and is demonstrable by abundance of experiments. The following will, *I hope*, give us some light, whereby we may judge of the nature of the *Acid*, in Bristol Waters.

VII.

TAKE a glass of water, drop into it, a solution of silver in Spirit of Nitre, and it will instantly grow turbid, or rather milky, and soon deposit a white precipitate.

VIII.

IN a glass of water, pour a solution of lead in the same Acid, and the same effects will be produced.

C O R O L L A R Y.

FROM these two experiments, it is demonstrable, that a portion of *Sea*, or *Marine* salt, is contained in these Waters; for, by the union thereof, with the Nitrous Acid, an *Aqua Regia* is formed, which, though a solvent for gold, is not so for silver,

ver or lead; and, in consequence thereof, this precipitation ensues.

IX.

IN a glass of water, pour a solution of Quicksilver, in Spirit of Nitre, it instantly grows turbid, and affords a yellow precipitate, of the very colour of *Turbiths Mineral*.

C O R O L L A R Y.

FROM this experiment alone, we may conclude, that the *Acid* of our Water, is of the *Vitriolic*-kind; and that it attracts or is attracted, by the *Mercury*, more strongly than the *Acid* of *Nitre*, which was the *Acid* used in the solution. For Mercury dissolved in Oil of Vitriol, on the addition of Water, affords the same coloured Precipitate; and, we know no other *Acid* that will produce this effect.

HENCE also, we may be assured, that this Water is impregnated, not only with a *Volatile Acid*, but also that this *Acid* is of the nature of a *Vitriolic*, and *Marine Acid* unit-

ed together; the virtues of which, when diluted with pure Water, we have reason to conclude, must be the same with *Bristol Water*, drank on the spot. By means of this *Acid* it is, that those Waters become impregnated with their other fixed principles. When this *Acid* has escaped; the Waters become ineffectual: yet though they are greatly changed, by boiling, or keeping, when an Acid is added to them, they produce the same Phænomena with *Alkalis*, as tried at the Fountain-head, without Acids.

X.

To a glass of water, let a few drops of the Tincture of *Galls* be added, and it affords no other change of colour than it does with distilled water.

XI.

To a glass of distilled Water, in which some *Sal. Martis* was dissolved, a few drops of Tincture of *Galls* were added; the purple colour was immediately produced.

C O R O L L A R Y.

HENCE it is plain that our Waters contain no *chalybeate* principle, volatile or fixed; else would the same appearance be seen in the tenth, as in the last experiment.

XII.

INTO a glass of Bristol Water, some drops of *Spir. Sal. Armon.* were dropped; no change of colour, other than when dropped into distilled Water.

XIII.

INTO a Glass of distilled water, a Solution of *Copper* was poured, upon which was also poured some *Spir. Sal. Armon.* A faint Blue immediately ensued.

C O R O L L A R Y.

HENCE may we conclude, That this Water contains nothing of a *Coppery* substance.

XIV.

FIFTY Pints of this Water, *Winchester-Measure*, were evaporated in an open Vessel,

fel, over a gentle Fire. First, it loses its pellucidity, and gradually deposits, a pale terrene, light, chalky substance, like that with which the Tea-kettles are lined, in which this Water is boiled; thus is the Water decomposed, and spoiled of its Mineral-Acid-Spirit, which rendered it hard; it now becomes soft as Rain-Water, and has no more virtues. And when the whole humidity was evaporated, it afforded a *Residuum* which weighed 240 Grains, of a saltish, bitter, taste; but not perfectly dissolvable on the Tongue.

XV.

FIVE Scruples of this Residuum being digested in a Sand heat, in four Ounces of distilled Rain-Water, 'till all was dissolved, that was dissolvable, and then philtred thro' *Cap-paper*; there remained a white earthy Substance, undissolvable in fresh, distilled, Water, or even in the Acid of Sea-Salt; weighing 56 Grains, and which is convertible into *Lime*, though without a calcining heat,

heat, it is no more than a simple *calcareous* earth, which, partly dissolves in the Acid of sea-salt, though there remains still a part undissolvable, a *Selenite*.

ARE we, hence to conclude, that these Waters contain *Lime*, as some have affirmed, and many believe, even to this day? No, for though they contain a principle convertible into lime, it does not therefore follow, that they should partake of real lime.

THUS.—There are many, who believe, the real existence of *Sulphur* in the *Bath Waters*; because, in accounting for the heat of Mineral Waters, it is allowed that the heat proceeds from that subtile, elastic, and penetrating Vapour, which arises from beds of sulphureous *Marcasites*, heated or kindled, by the admission of external air. But, these Gentlemen ought first to consider, that, as there are *Pyrites* composed of Iron and Sulphur, so there are also *Pyrites* of all colours; and which

take in all sorts of metal, as well as *Cobalt*, *Arsenic*, *Antimony*, *Bismuth*, *Alum*, &c. And till they are sure of the nature of that *Marcasite* by which the Bath Waters are impregnated, how can they pronounce them *sulphureous*?

BUT again. ——— Supposing they were actually assured that the *Pyrite* or *Bed of Marcasite* which heats the Bath Waters was really composed of *Iron* and *Sulphur*; are they hence to infer that the Bath Waters contain real *native Sulphur*? The supposition is absurd; for to heat or impregnate any Water, we must suppose that the bed of *Pyrite* is actually set on fire, by the admission of external air. This mixture then, of *Iron* and *Sulphur*, being once set on fire, is not easily extinguished, till the sulphur is decomposed, till its *phlogiston* is consumed by fire, and its Acid united to the *Iron*. With what then will this mass be able to impregnate water? With a solution of *Iron*, *Martial Vitriol*, and with nothing else. —

For

For once to indulge those who are so fond of Sulphur, we allow them, that the Bath Waters may be heated, as well as impregnated from a neighbouring bed of Pyrite, whose composition may be *Iron*, and *Sulphur*; so far, they are sulphureous; but that sulphureous Waters should exist without that *phlogiston*, which is inseparable from sulphur, is absurd. Nor is there one Grain of *Sulphur* native or factitious, in all the Bath Waters. Experiments, easy and obvious, with a very little reading and attention might remove their prejudice; but opinions when they are sanctified by time (as *Mr. Locke* well observes) become obstinate.

XVI.

THE saline solution, which passed the Philtre, evaporated, yielded 40 Grains of saline Matter. This Salt (by a variety of Experiments) is found to be *neutral*; being the volatile Mineral spirit and Alkaline base of the Waters united together.

XVII.

XVII.

THIS Salt sprinkled on live coals, neither swells into bubbles, as *Alum* does, nor emits white flame, as *Nitre*; but calcined with charcoal, it imbibes the inflammable principle, and forms a *Hepar-sulphuris*.—By the air, it increases in weight, and grows white, as if it was covered with meal, if it be first separated into transparent crystals, which is easily done, after a careful evaporation, and keeping it in a coal place.

C O R O L L A R Y.

HENCE, may we be assured, that this Salt, is neither *aluminous* nor *nitrous*; but that it is a pure *neutral salt* similar to that of *Glauber's*; which consists of a mineral, active spirit, and an alkaline base; to which, from the following experiment, some portion of *Sea Salt* adheres, as nothing but the *Sea Salt* produces the same effects.

XVIII.

XVIII.

INTO a solution of this Salt pour a few drops of a *solution* of *Silver*, in *spirit* of *Nitre*; and, it instantly throws up light clouds, which fall in the form of a white Precipitate.

SUM of these EXPERIMENTS.

FROM these several Trials, we may fairly conclude, 1. That those who have deemed *Bristol Water* to be a simple elementary Fluid, have founded their opinion merely upon ignorance.

2. THAT those who have charged them with *Iron*, *Nitre*, *Alum*, *Vitriol*, *Sulphur*, *Lime*, &c. have either grounded their Opinions without Experiment, or have erred in their Analysis.

IT now remains to affirm *positively*, what Principles constitute BRISTOL WATERS. And here, we may conclude that they contain,

I. THE

1. THE Spirit.
2. THE pure Element.
3. A VITRIOLIC Acid.
4. A MARINE Acid.
5. A NEUTRAL Salt.
6. AN Absorbent Earth.





T H E
 C A U S E of H E A T
 I N
 M I N E R A L W A T E R S.

C H A P. IV.

AS Waters, in a great measure, owe their Virtues to their HEAT, or Temperature; it may, perhaps, be satisfactory, as well as instructive, to know how Waters are heated, and impregnated.

THERE were Philosophers, as well as Poets of great name, who accounted for the *Heat* of Waters, from the discovery of Sulphur, Bitumen, or Fossil coal, in the neighbourhood

bourhood of such Waters.—But, in order to heat, these must be actually set on fire, and continue to burn. What shall we say then of Hot Waters found in places, where such fires never actually existed?

AN immense quantity of *fire* was placed by some fruitful brains in a great cavern, in the centre of the earth, supposed to be the cause of subterranean *heat*, of the *origin* of springs, cold as well as hot, and of the production of Medicated Waters. KIRCHER, BLONDILE and BURNET, have framed many curious romances from this Hypothesis. But, in delving into the bowels of the earth, no proof, or vestige of such central fire has ever yet been found.

PARACELsus supposed the heat of Waters to be *innate*, created so, from the beginning.

OTHERS again deduced the *heat* of Waters, from the mixture of *Acids* and *Alkalis*. They saw that quick-lime mixed with water, produced *heat*; they hence, vainly supposed

posed the actual existence of unflaked Lime. But how is this Lime to be produced without actual fire, and how are these Waters to be impregnated, where there are no Volcanos? Besides Lime once flaked, could neither heat, nor impregnate any more.

OTHERS accounted for the Heat of Waters, from the exhalation of certain *Acid* spirits, acting upon bodies of different sorts.—But there never was found, in Nature, any other Acid, excepting that of *Vitriol*, and this never in so liquid a state, as to mix with water so as to occasion heat.

BERGER and LISTER were the first who asserted that the PYRITE was the cause of *Heat* in Waters; Dr. FRED. HOFFMAN has adopted their doctrine, and so has Dr. LUCAS.

THIS Mineral, was known to the Greeks by the name of λίθος Πυρίτης, to the Latins, by the name of *Lapis Pyrites*, and to the Arabians, by the Name of *Marchasita*, which latter is retained in most modern Languages

THE

THE Pyrites is of all colours, of all shapes, and composed of all sorts of metals, though it is chiefly composed of *Iron* and *Sulphur*, hence it is found so extremely combustible; it catches fire above ground, and burns till all its sulphur is consumed, and all the Iron, or Aluminous Earth is dissolved in its *Acid*, whence *Martial Vitriol*, *Copperas*, or *Alum*.

IF then a bed of Pyrite under ground, catches fire by the admission of external air, admitted through the cracks or fissures of rocks, it continues to burn with such a slow consumption of its materials, as accounts for the duration, equality and uniformity of *Heat*, in Mineral Waters.

THIS Pyrite is known to be the Miners bane, it exhales a subtile acid vapour, which poisons the air, and is sometimes, so charged with *Phlogiston*, that it burns with inexstinguishable fury. At *Whitehaven*, this vapour is carried out of the pits by proper funnels or vents, and set on fire, at its exit; by which it is made to answer the purpose of a lighthouse

house for the ships, while, thus, it is prevented from extending its fury within. *Berger* tells us of whole rich sulphureous mines being actually destroyed in *Misnia*, for want of such vents.

THE Pyrite abounds universally; shells of all sorts, are filled with this Pyrite. The Conflagrations of *Ætna* and *Vesuvius* are occasioned by the ignition and combustion of this Marcasite. Heat rarifies air and water, and these confined, produce explosions and earthquakes. Hence also, may we account for Thunder, Lightning, Meteors, and showers of Mineral Particles: *PLINY*, *AGRICOLA* and *BERGER*, favour this opinion.

IF the Pyrite then alone, can contract heat and fire, we may easily conceive how it communicates its heat to bodies which surround it. Waters passing over a bed of Marcasite, thus ignited, partake of its subtle vapour, contract heat, become charged with whatever particles were soluble in wa-

E

ter;

ter; and thus impregnated, they are poured out on the face of the earth. Hence the variety of medicated Waters, according to the substances of which the Pyrite consists, Chalybeate, Sulphureous, Vitriolic, Aluminous, &c. Hence are Waters hot, cold, or temperate, according to their distance from the bed of Pyrite. Some Waters are impregnated, without being heated, and some are simply heated, without being impregnated, this depends upon various circumstances.

To the heated Pyrite, may the *heat* of Mineral Waters in general be ascribed. To the exhalations arising from this Mineral heated, may be ascribed, the *Volatile Principles*, the *Phlogiston*, and the *Acid* demonstrated in Waters. To the latter, the solution of *Earth*, as well as of Salts.

THE



T H E

Contents of Bristol Water,

WITH THEIR

V I R T U E S.

C H A P. V.

IN demonstrating the *Principles* contained in the *Waters*, I have purposely, avoided a large train of Chymical, and Philosophical Experiments; I have contented myself with a few that are easy, simple, and conclusive. With Dr. FRED. HOFFMAN, I propose, to examine each INGREDIENT, and to enumerate those symptoms, which, *separately*, or *collectively* they bid fair to remove.

I. THE SPIRIT.

THE first *Principle* of Water, and that which it soonest loses, is its subtile *Æther*; which is the origin of its truly spirituous part; and that which preserves it from putrefaction.

Lord BACON judges that to be the best Water for common uses; which evaporates fastest by boiling.

HIPPOCRATES pronounces that to be the lightest and best Water; which is soonest heated, and soonest cooled.—Again. Those are certainly the best Mineral Waters, which, when taken up, at the pump, discharge the greatest quantity of bubbles; for these bubbles are nothing else, but the subtile æthereal substances, residing in the pores of the fluid. Hence it is, that the brisk *spirituous* Waters of Cold Springs, break the bottles: the labourers are obliged to let the bottles stand open, for some time before they cork them.—Hence may we learn the necessity of drinking our Waters at the pump.

MINERAL WATERS lose their virtues, sooner in a hot air, than in cold.—Hence appears the reason for drinking them early.

MINERAL WATERS, which have been long exposed to the air; those also, which have been boiled; entirely lose their medicinal virtue, taste, and spirit.—Hence appears the absurdity of those who warm their Water in an open vessel. The best way to heat them is by putting the bottle corked into a vessel of warm water.

WE have proved, that brisk Medicinal Waters contain a very subtile, active, and elastic *Principle*, and this I take to be the effectual part; or as it were, the SOUL that gives them surprising virtues.

THIS penetrating *Spirit*, is perceptible to the sense, filling the head, making the drinkers heavy or sleepy: this frequently happens at *Cheltenham*, and oftner at *Bath*; and the Waters of *Pyrmont* cannot be drank at the spring, nor till a part of the spirit is exhaled.

THIS spirit heats and cherishes the body, encreases the appetite, raises the pulse, and gives a rosy colour to the cheeks.

THIS spirit is also the cause why the Waters pass so nimbly; why they open obstructions, strengthen the fibres, and promote all sorts of excretions.

WHEN this principle is exhausted, Mineral Waters become no better than common Water.

THIS spirit is blended amongst all the sulphureous parts of Minerals; and pervades all the lower regions of the earth; it becomes the animating *principle* of Minerals, and the true cause of those changes, and effects, which happen in the bowels of the earth.

THIS is the reason why there is such difficulty in imitating Mineral Waters; for, were their virtues, owing to a solution of their solid substances, these could be collected after evaporation; and mixed with simple Water at our pleasure.

CAN this most efficacious principle of Mineral Water, be separated by art, so as to be kept as a Medicine for use?— Attempts have been made, by the *Sieur de Clos*, and others, but in vain. Dr. SHAW seems to think, that this *Spirit*, is not a corporeal thing, but rather an action or effect, depending on the conflict between *Acids* and *Alkalis*.

THE following experiment gives a hint for imitating some of the natural Mineral Waters by art; and obtaining a Mineral Spirit, if it can be caught.

PUT an ounce of filings of iron into a phial; drop a quantity of pure strong Oil of Vitriol upon it; add three parts Water, to the mixture; there arises immediately, a violent frothing ebullition; and, at the same time a violent pungent sulphureous vapour endeavours to break out; so as scarce to be contained in the phial, by the strength of the finger: if, just after compressing the vapour, the finger be removed,

and, a flaming candle applied, there immediately bursts forth an explosion, with a crack and a flame, resembling lightning.

IF a way could be found to obtain a large quantity of this vapour or spirit; it might answer in virtue, to the volatile aerial spirit of Mineral Waters.

THIS vapour, tho' totally sulphureous, has nothing of the fetid smell of Brimstone; the reason is, that this spirit, is not the produce of common Sulphur, extracted by a culinary fire, which partakes of the empyreumatic Oil.

THOSE who believe the actual existence of *Sulphur* in the *Bath Waters*, may be convinced, that the *Sulphur*, which they mean, is not the work of Nature.—They have reason much more to be satisfied; for, in place of common Brimstone, they have a far more noble and more powerful Medicine; I mean, that elastic, penetrating Spirit, which pervades all things.

THE *Volatility* of *Spirit* is elegantly illustrated, by the Great Philosopher and excellent Anatomist MUNRO. He says,—“ I
 “ mix'd filings of Iron, Oil of Vitriol, and
 “ Water, in a Florence bottle, which I laid
 “ on its side ; having fitted another to it,
 “ in which I had put some fountain-water.
 “ The fumes which arose in effervescence,
 “ came over into the other glass :
 “ when this effervescence was over, I removed
 “ the glass with the water, which was quite
 “ limpid, but had a strong empyreumatic
 “ smell : its taste was, first pungent on
 “ the tongue ; and then, the acidulous
 “ taste prevailed. When Tincture of Galls
 “ was mixed with it, it became of a red
 “ purple, but faint colour, which held many
 “ days, without precipitation. Next morning
 “ the empyreuma of the remaining Water was
 “ gone ; and, it had a very agreeable brisk
 “ Spaw-taste : this went off in less than a
 “ day : a small quantity of the saffron powder
 “ fallen

“ fallen to the bottom; and, the galls had
 “ no effect upon the water.”

BUT to proceed.—We may conclude that the virtues of this; as well as of all other MINERAL WATERS, greatly depend upon their SPIRIT.

II. THE PURE ELEMENT.

THIS is the receptacle or vehicle of all the other ingredients; and far exceeds them all in quantity.

PHYSICIANS are surely to blame, in not examining those Waters, where they practise: such a knowledge would greatly facilitate the cure of diseases, as well as prevent them: the reason of neglect in this particular, seems to be owing to an indifference of those blessings, which Providence bestows without labour or expence.

THERE are many ways of trying the virtues and qualities of Waters. People who are accustomed to drink water, can discover the best, by the taste; by the Water Thermometer

mometer also, or the Air-pump. The lightest Waters arise the soonest, in *Distillation*; and so in *Boiling*, Waters lose their volatile spirituous parts. Hence appears the mistake of making COFFEE with water that has boiled too long.—There are also experiments, easy and obvious.

First, DROP Oil of Tartar, into a glass of Water; if it is pure, as Rain Water distilled, the liquor will shew *no* change: If impure, the Water turns milky; especially, if the Water abounds, with a *Chalky Earth* or *Common Salt*.

Secondly, A SOLUTION of *Silver*, in *Aqua Fortis*, turns crude Water thick, and grey-coloured: If it participates of *Iron*, almost red.

Thirdly, If it contains *Vitriol*; an infusion of *Galls* will turn it black.

SPRINGS widely differ from each other. Some Waters are hard, crude, and rough; Others again, are soft, mild, or smooth: the first are accounted bad; the last good, or wholesome.

ICE

ICE or SNOW WATER, is reckoned, by HIPPOCRATES hard: the light parts are diffipated; the grofs are left behind. *Snow Water* produces fwellings in the Glands of the throat, well known to thofe who live at the foot of the *Alps, Pyreneans, &c.*

“ *Quis, tumidum guttur, miratur sub Alpibus?*” Says *Horace*.

IN the middle of *Ice*, there are bubbles, which, by their elastic quality, encrease the bulk of the *Ice*; and caufe it to poffefs a larger fpace, than when in the form of *Water*: this is the reafon, why bottles or earthen veffels, in which *Water* freezes, generally burft.

WATERS found in Mines; as well as thofe which defcend from rocks, or run through *chalky beds*, are hard: they are impregnated with rough, earthy particles: *Hippocrates* condemns them as unfit for common ufe; they pafs not by urine; they bind the belly, hinder the fecretions, generate wind, breed ftones, rot the teeth, and

and relax the gums. Such Waters are used by artificers, for making of *Paste*, and forming of powdered Alabaster into *Plaster of Paris*.

STAGNANT WATERS are unwholesome; as also those which arise from springs in open Champaigne countries, having a muddy, unctuous, earthy, or bituminous bottom, though frequently refreshed by rain, they grow turbid, and fetid: the sunbeams exhale their useful, spirituous parts.

THOSE Waters are *wholesome*, which are *light, soft*, and ready to pass through the excretory vessels.

RAIN WATER claims the first place; the *Chemic*-sun distills it; the soft, light parts, are exhaled, digested, and enriched with the universal æthereal and sulphureous salt, or exalted Nitre: the saline, gross and heavy parts are left behind. This Water is better fitted than any other for the nutrition of vegetables; the brewing of ale; infusing of herbs; baking of bread; drawing of
tea:

tea: and washing of the *Calces* of Minerals. It soon corrupts, because it abounds with sulphureous, animal, or vegetable exhalations; but this is easily remedied, by pouring it off after it has stood and settled.

SPRING WATERS are wholesome, when they lie high, rise in clean earthy hills, and run upon a gravelly bottom, or pure hard clay; provided they be tasteless, limpid, transparent; cool in the summer, warm in the winter; and receive the rising sun. For, Waters passing thro' a porous, spongy earth not being dissolved thereby, are filtered, percolated and purified, according to a custom in Italy, and hot countries; where they pass their Stagnant or Tank Water, thro' a spongy mortar; vulgarly called a *dreeping-stone*; one of which I saw on board the *Antelope* man of war stationed at *Bristol*. The Captain told me that he made use of the Water of that spring over against the Hotwell on the opposite bank of the river, commonly called the *Mill-Spring*. Dr.

Lucas

Lucas analysed this water, and declares, that he found not its equal in Britain; being remarkably pellucid, inodorous, tasteless, and sparkling; weighing one grain lighter, than distilled rain Water; and, being evaporated to dryness, it yields only five grains of pure elementary, calcareous earth, to a pint. And yet, when I examined this filtering-stone, there seemed to be a thick, brownish cloud hanging in the body of the Water; the sides and bottom appeared very foul; though the Captain assured me, that the stone had been well scraped and brushed that very morning.

RIVER WATER cleared of its filth by standing or filtering, put into large earthen-vessels, and deposited in a cellar, keeps better than by any other method. Thus, is the Water of the TIBER (muddy enough as it runs) clarified by people of fashion, at Rome, and preserved for years.

RAPID RIVERS afford a lighter and more subtile Water. Thus, the Water of the
 Rhine

RHINE and the RHONE, which descend from the highest mountains, are found to be lighter on the balance, than that of other rivers. And, it is remarkable, that ships coming out of the MAINE, into the RHINE, draw much more Water in the latter.

JACOB SPON (in his *Observationes circa Aquam Rhodan*) assures us, that this Water kept in jars in a vault, will continue sweet for an age. The slowest rivers, are (however) fittest for domestic uses.

WE now proceed to enumerate the virtues of the *simple pure element*.

A KNOWLEDGE of the laws of *circulation, secretion, and excretion*, informs us, that our juices require a constant motion: they contain particles saline, unctuous, mucilaginous and earthy: in a state of warmth, rest, or moisture, those particles are corruptible. That this circulation may be kept up, there is a necessity of a constant addition and recruit of particles aerial, æthereal,
fluid

fluid and elastic : but how can these particles, be assimilated, or mixed with the blood, without the interposition of the elementary fluid ?

BLOOD drawn from a man, in health, contains two-thirds Serum ; and one part red Globules. Can it then be surprizing that water should mix with water ? That this happens, we can no longer doubt, when we know, how soon watery liquors pass by *Urine*.——In *Warm-bathing*, how considerably is the weight of the body increased ; notwithstanding the great expence of Sweat ?——Open the Abdomen of a Dog, and throw in a quantity of warm water, it will all be soon absorbed.—*Drastic* Purges discharge Water contained in the Abdomen. Dropsies are, sometimes, actually cured this way.——Dropsies have been carried off by *spontaneous vomitings* also ; instances of this kind are ('tis true) hardly to be met with, either in History, or Practice ; “ Yet this actually happened to

“ an eminent Physician of *London*, about
 “ two years ago : he was once tapped for
 “ the Dropsy, and had a temporary cure ;
 “ the Abdomen filled again ; a second *tap-*
 “ *ping* was meditated, a spontaneous vo-
 “ miting intervened, by which the whole
 “ was discharged, and the Abdomen has
 “ not since filled.”—Dropsies have also
 been cured by sweating.—And yet, these
 surprising effects happen, no other way,
 than by being assimilated with the blood,
 and going the round of the circulation.

IF then it is apparent, that Water does
 easily mix with the blood ; can there be any
 remedy in nature, that bids so fair for *pre-*
venting, as well as *curing* diseases ; for pre-
 serving health, or prolonging life ?

THE duration of life, depends upon the
 circulation of the fluids : these depend up-
 on certain instruments ; *elastic fibres*, which
 compose the Canals, and Muscles : if the
 Spring of these becomes impaired, there
 must ensue stagnations, in the capillary ves-
 sels,

sels, hence diseases. In all machines, the springs and moving powers, by reason of a change of the matter, of which they consist, must become weak; and, at last, useless: so fares it with the human frame: the fibres grow hard and crisp; the canals straiter, so that the fluids cannot pass. This is the nature, and round of things, nor can it be kept off by art; yet, certain it is, that few live out the number of their days: intemperance, ignorance, and accidents, shorten our lives; as Lord Bacon well observes.

By the laws of *Motion*; there must be a connection between the agent, and the patient, to produce the effect: if there happen inveterate obstructions; large discharges in the cavities; and, actual putrefactions: what can medicines do? Is there such a thing in nature as a real specific? *Bark* is so called, in intermitting fevers: so is *Mercury*, in Venereal Disorders: *Opium*, in violent pain. These, well employed, often

do great things ; but they are, by no means, equal to their praises.

DISTEMPERS, bearing the same name, proceed from different causes ; different also are the symptoms : bodies differ in their constitution : Remedies act according to the manner in which the body receives them. He, who has thoroughly studied the art, is often puzzled ; he who, indiscriminately, prescribes the same medicine, carries about him the infallible mark of a quack.

HAVING thus premised ; we may assert, “ that Water is a medicine suited to all persons. That there is no such preservative. That it is serviceable in *acute*, as well as *chronical*-diseases.”

By its moisture, thinness, and rarefaction, it dissolves thick and viscid humours ; it dilutes acrid salts ; opens obstructions, and promotes secretion. All which it performs as a *simple fluid* ; its ingredients, serve only to quicken or stimulate the vehicle.

WATER-

WATER-DRINKERS, are generally healthier than Beer-drinkers. Water is the most proper menstruum for dissolving the aliment; extracting the Chyle; and carrying it through the circulation. It dissolves that viscid slime, which lines the glandular coat of the stomach, and intestines; whereby the *Gastric Juices*, are enabled better to *digest* the food.

IN southern climates, Water is the most common beverage; their inhabitants have whiter and sounder teeth; nor do they know the *Scurvy*.— *Should not increased perspiration be taken in as a cause*

THUS far by way of *prevention*. We now proceed to see, what *Simple Water* will do, in the *Cure* of Diseases.

IN ACUTE CASES (the principal of which are FEVERS) the chief intention is, to supply the *serous* part, as fast as it flies off: the *Materia Medica*, affords no medicine for this purpose, equal to Water duly tempered: HIPPOCRATES, SYDENHAM, BOERHAVE, and all their *rational* successors, have re-

commended *Ptisans*. By these alone, more cures have been performed, than by all the lumber of the shops: these they gave at first in small quantities, and often, but towards the crisis, with a liberal hand.

IN CHRONICAL DISEASES, there is generally an obstruction of the Glands, or a foulness of the juices. Waters, which, upon examination, contain little else than the *pure element*, have been found remarkably successful: of this sort are numerous springs in *Germany*, the Waters of which cure Rheumatism, Gout, Scurvy, Hemorrhoids, and Suppression of the *Menses*. *Riverius*, *Bellonius*, *Sylvaticus*, *Martianus*, and *Avicenna* confirm this truth.

How serviceable Medicinal-Waters *hot* and *cold*, have been in the cure of such disorders, experience daily testifies; and that the greatest part of their virtue, is owing to the pure element, is beyond dispute.

SOME stomachs bear water warm, much better than cold. Were people of *rigid* fibres

fibres only, to follow the custom of TEA-DRINKING, many good effects might be produced; obstructions might be removed, by the penetrating quality of the fluid, added to the saponaceous quality of the sugar, which renders the Water more miscible with the blood; Acrid salts might be diluted; viscid phlegm might be dissolved; and the astringent quality of the plant might answer this good purpose, of making the fluid pass off the sooner. The sanguinary, the bilious, the melancholic, might be eased.—Children might (by warm Water) be relieved from those acidities, brought on by the curdling of the milk.—Fever and Inflammations might be prevented in the young; and aches and obstructions in the old: The belly might be kept soluble; The urinary passages cleansed from Gravel, or Calculous-adhesions; and the most healthy of all discharges, *Insensible Perspiration*, might thus be promoted.

BUT, such is the force of Education; that the Lazy, the Indolent, and Effeminate;

men, as well as women, of weak nerves, and relaxed fibres; indulge themselves in the immoderate use of a *Tipple*, which enervates still more and more: they dread the effect of the TEA, which, (by its *astringency*) is calculated for their benefit; they make the infusion so weak, that it answers only one destructive purpose, of *relaxing* the *muscular* coat of the stomach: hence, *indigestion*, with all its direful consequences. The contractile fibres, (by being soaked in warm Water) lose their elasticity, and the food lies like a load: hence *Sourness*, *Flatulency*, *Vapours*, &c.

WERE the stomachs of such to be daily refreshed, with a glass or two of light *Spring Water*, acidulated with a preparation of *Vitriol*; an artificial Medicinal Water might be obtained, productive of the best purposes.

IF *Sipping* hot liquors must be the fashion, have we not Indigenous Plants, whose Virtues far exceed the most costly TEAS? Choice

Choice might be made of such, suitable to every Constitution.—For Diseases of the lungs; we have a numerous list of *Pectorals*.—We have *Ground Ivy*, in disorders of the *Kidneys*.—*Buck Bean*, in the *Scurvy*.—And *Valerian* in *weak Nerves*.—These, and such as these, might be, more useful than more costly preparations; and, were we but told that they came from *India*, the difference of flavour, would soon be dispensed with.

IN *Decoctions*, the Virtues of the Ingredients are too much exhaled.—In *Infusions*, the Aromatic Virtues are all, as it were, concentrated and received by the Olfactory Nerves, as well as the Stomach. One caution, in Infusions, may be necessary: The water ought to be poured on the plant, just as it begins to boil; if the æthereal *Spirit* is to be saved.

To sum up all—In whatever cases there is a necessity of *altering, evacuating, opening*
 or

or *resolving*, WATER is the *Grand Specific*.

THE VITRIOLIC ACID.

THE PYRITES, or *Vitriol Stone*, owes its origin to the acid of common sulphur, which is the universal acid ; it abounds in the bowels of the earth, it cleaves to almost every Mineral, and is to be found in great plenty, in all the neighbouring hills ; from this *Pyrite*, the acid exhalation is continually breathing up, and mixes with the Waters.

“ FROM this PRINCIPLE of the *Volatile Vitriolic Acid*, united and incorporated with the *pure element* it is, that I may venture to account for the chief, I had almost said, the sole effects of *Bristol Water*. For, in all those disorders, in which these Waters are accounted *Specific*, there is either a manifest, or a latent fever : whether this fever, or feverish heat was the original cause, or consequence, it avails but little. One thing is certain, that those *Colliquative discharges*

charges of *Sweat*, *Urine*, and *Fluxes* of all kinds, are upheld and fomented by this latent fever; the blood, by its *velocity*, and *beat* becomes *acrid*, and unfit for the nourishment of the body; it expends itself in unnatural secretions.

“ As soon as this *feverish heat* is subdued, the blood acquires its pristine balsamic nutrient qualities; the *Chyle* is, properly assimilated, the body recovers its wonted vigour and alacrity, and becomes fit for all the animal functions. And thus, in accomplishing this great and salutary purpose, we may venture to pronounce, that Bristol Waters are superior to medicines of all sorts, and equalled by no Medicinal Waters hitherto discovered.”

THE MARINE ACID.

By the eighteenth experiment, I have shewn, that a solution of the *salt*, found in the residuum, answers to the characteristics of common *Sea Salt*; as also by its crack-
ling

ling in the fire, and by turning *Aqua Fortis* into *Aqua Regia*.

HENCE we may account for the virtues of these Waters, in cleansing the stomach and intestines of tough viscid humours; in promoting digestion, and correcting such crudities and flatulencies, as produce Spasmodic disorders.——When, besides, the Vitriolic and Marine Acids become blended together in the vehicle of the fluid, they remarkably resist putrefaction, and subdue those fevers which are the consequence of Pus absorbed and carried through the *circulation*; as also those brought on by *inani-tion*, the consequence of which is *putres-cency*; agreeable to that axiom, “*Qui fame moriuntur, febre moriuntur.*”

THE ABSORBENT EARTH.

By the fifteenth Experiment, it appears, that from five scruples of this Residuum, digested in a *Sand heat*, with distilled Rain-water; there remained unsifted a white Earthy Substance, weighing 56 Grains; which,

which, upon examination, was found to be a *Simple Calcareous Earth*.

THIS *Principle* renders the Waters safe, and wholesome; makes them fit to be drank as a common *Beverage*. This gives them a property of correcting Acidities in the first passages; hence, may we, in part, account for those Cures, which they daily perform in obstinate Fluxes, Gleets, and Female Weaknesses.

FROM the preceding *Experiments*, it must appear, that the Component parts of this medicated Water are,

First, THE universal solvent *Water*, the basis of the whole Fluid.

Secondly, THIS *Water* is, by a *Pyrite*, impregnated with the universal acid, in a subtile, volatilized state, readily flying off.

Thirdly, THIS acid renders the Water a fit solvent for such soluble bodies, as it meets with, in its passage.

WE have already considered the component parts, separately; and have estimated their

their virtues : but the qualities of the composition are not to be deduced from detached individuals, but from the *one great whole* that results from the union of the particulars. And this I propose to consider, in the next chapter, which treats of those diseases, in which Bristol Water is accounted specific.

To sum up the whole, much may be due to the *Water*, as a simple *Fluid*; something to its *Temperature*, something to the *Salts*, something to its *earth*; but most of all, to the *Subtile Mineral Acid Spirit*.





T H E
 Virtues of Bristol Water,
 IN THE
 CURE of DISEASES
 IN GENERAL.

C H A P. VI.

MEDICINAL WATERS have this in common, with other Medicines, that their good effects depend upon a proper administration; and this requires a knowledge of the *Patient*, of the *Distemper*, and of the *Waters*. We need not wonder, that he, who is ignorant of either of these particulars, should miss his aim. Is there
 any

any reason, that the *Waters* should lose their character, because the Physician is ignorant? Or, because they cannot restore loss of substance, lungs ulcerated and consumed, juices totally wasted, and limbs enervated by inveterate Ailments?—Should Bristol Water lose its credit, because it has not the Power of raising from the dead, and regenerating, as it were, Spectres, who may be said to breathe rather than live; who undertake long and painful journies, for no other purpose than to see St. VINCENT'S ROCK, and be returned in a *Hearse* to their Family Vaults?

THESE Waters seldom fail of success where the disease is curable, where the physician knows to apply them properly, and where the patient does justice to himself. What medicine does the *Materia Medica* afford, more safe than salts? What so mild, as a subtile, pleasant, spirituous fluid? When they *purge*, they occasion no loss of strength, no sickness. When they pass by *Urine*, they
bring

bring on no strangury or sharpness, but pass off, with a degree of pleasure. When they promote *sweating*, they occasion no faintness. Persons of all ages, as well as sexes, have safely, and successfully drank these waters.

FROM false and theoretical notions, absurd and pernicious doctrines, have spread, concerning the use of Mineral Waters in general. Physicians themselves have run into great errors: there are many who pass their opinions upon hearsay, or illgrounded analogy; they fancy noxious ingredients in Waters, and, boldly venture to declare them violent remedies: the authority of men, *fortunate* or *eminent* in their profession, sanctifies opinions however grounded.

THUS Dr. MEAD, who was, indeed, the ornament, as well as patron of that science which he professed; in his *Monita et Precepta Medica*, roundly affirms, *That hot-bathing is hurtful to all paralyticks:—*

“Immerfiones calidæ paralyticis omnibus

“nocent” are his own words. This gentleman well knew, that the effects of *warm Water* simply considered, is to *relax*; hence he accuses bathing in general. He knew not the substances which compose Bath Water, its *acid*, its *iron*, and its *earth*; else he would have pronounced a Water, so compounded, the best of *bracers* or astringents, and recommended it, as highly proper in all relaxations of the solids. His pre-possession made him pass over what he well knew, viz. that *palsies* are, generally the consequences of previous obstructions in the blood vessels. In such a case, he would have allowed that Waters so volatile, and penetrating, bade fair for removing obstructions, by means of that *temporary* fever raised by *bathing*, and drinking warm Water in the act of bathing: such an artificial necessary fever resolves obstructions, and, at the same time, expels the peccant humours by the proper emunctories: The volatile, elastic, æthereal particles, enter with the fluid through the pores of the skin; they
become

become a fomentature to every vessel and fibre, by which their diameters are enlarged, and the contained fluid moves in a greater space, and thus is attenuated. In this light, warm-bathing, may be justly accounted a *Deobstruent*: whilst the waters (charged as they are) must act *externally* as bracers of the solids and constringers of the pores.

Dr. SUMMERS a late Physician of *Bath*, justly apprehending that the *sentence* pronounced on the Waters, by so great a man, might gain such influence on the minds of despairing cripples, as to deter them from pursuing a method known to be useful; with candour and due respect published a confutation of Dr. MEAD's assertion.—
 “ He rests the whole force upon arguments,
 “ which neither prejudice nor interest can
 “ be supposed to produce, *The Register of*
 “ *the General Infirmary at Bath.*”

HE examines the books for nine years
 G 2 back,

back, and finds the account of *paralyticks* as follows :

ADMITTED in nine years 310. Cured 57. Much better 151. No better 45. Incurable 42. Dead 12. Remain in the house 3.

ALL these bathed twice a week, and many thrice. Of those who were cured, or discharged as *much* better; thirty were 40 years old; fifteen were turned of 50, and five were 60 and upwards. These live under many disadvantages unfelt by persons of fortune. They come, besides, as incurables from other hospitals. Among the 310, there were 43 *Hemeplegias*, a species seldom curable by medicine. Of these, the state stood thus:—

CURED 4. Much better 13. Better 14. No better 2. Incurable 4. Improper 3. Dead 3.

Dr. MEAD had declared, that he knew some, who, after *bathing*, died *apoplectic*.

Paralyticks,

Paralytics, it is true, often die in this manner, especially if the disorder, originally began in the head; the palsy often brings on an apoplexy, and the apoplexy ends in a palsy. This, doubtless, encreased the doctor's fears; but, what makes greatly to our purpose, is that not one of the *twelve* who died, became *apoplectic*, nor was one of them seized with a fit in the Bath, or immediately afterwards; though they stay in, often an hour or sometimes longer, and continue in the hospital sometimes for 12 months.

IF *bathing* produced such dangerous effects, what would become of our guides, who continue in the Bath for two or three hours every day; and yet are known to be healthy and long-lived?—Amongst Dr. GUIDOT'S 200 cases, there are 23 paralytics, 17 of which were cured, four of which were *Hemiplegias*, and the other six were much better by bathing.—Dr. *Summers* dedicates his pamphlet to the Governors of the Bath Infirmary, there he tells them,

“ That this undertaking was intended to
 “ ascertain the *nature* and *efficacy* of the
 “ Bath Waters, that the *rich* may be en-
 “ couraged to partake of a blessing which
 “ they have given to the *poor*. The public
 “ has a right to be informed, how far their
 “ noble intentions have been answered,
 “ and what good their benevolence has
 “ produced.”——The Gentleman, who
 speaks thus freely to the Governors, was a
 worthy Physician of that Infirmary, and,
 yet, he stands by himself in this respect, for,
 excepting these *Paralytic Cases*, the public
 has not been favoured with one from that
 hospital in fifteen years, and these are re-
 corded in a manner, as if the experience
 was the property of the Attendant Physi-
 cian only.

“ A LADY who now lives in Golden-
 “ square, had a constant vomiting for a
 “ month; with racking pain, about the
 “ region of the stomach; her brother-in-
 “ law, read his wife’s letter to me, de-
 “ scribing her case: I suspected that her
 “ disorder,

“ disorder, was owing to *biliary concretions*,
 “ some of which were then, actually pas-
 “ sing through the duct : I told him, that,
 “ if she could be transported to Bath, she
 “ would find a certain cure ; this was re-
 “ lated to an eminent Physician then at-
 “ tending, who roundly pronounced Bath
 “ Waters pernicious, in all respects; expe-
 “ rience induced me to adhere to my first
 “ prognostic : she was, with great difficul-
 “ ty, brought down to Bath, her pain was
 “ exquisite, she threw up even Laudanum
 “ itself : I had her lodged in a house, near
 “ the Queen’s-Bath, from whence there
 “ was a communication or *Slip*. I advised
 “ her to drink a glass of Water at any
 “ time, and as fast as she threw that up,
 “ another. She was put into the Bath
 “ sometimes twice in a morning, and there
 “ kept as long as her strength could bear
 “ it. In a few days, the water began to
 “ stay on her stomach : she passed by stool,
 “ at one time, twenty-two gall-stones, and
 “ more at different times : her pain ceased

“ and, in less than three weeks, from a
 “ skeleton, she grew plump, and walked
 “ abroad. She made use of no other me-
 “ dicine but an occasional *deobstruent* purge
 “ of Rhubarb, Rad. Curcum. Rub Tinc-
 “ tor, &c. with *Castile Soap* daily.

“ SHE went home; her complaints re-
 “ turned; she soon came down again to
 “ Bath, where she followed the same re-
 “ gimen, and found the same cure, but
 “ chose to stay for six months; she drank
 “ about a quart of Water every day, and
 “ swallowed upwards of two pounds of
 “ soap every week; she now enjoys good
 “ health, after four years persisting in the
 “ use of the soap, and Bath Water warmed
 “ at home.”

“ THE cause of false judgment, and
 “ different opinions among men, is (ac-
 “ cording to Dr. OLIVER in his judicious
 “ treatise on *warm bathing in gouty cases*)
 “ that facts are seldom truly represented;
 “ circumstances are added or omitted.—

“ A

“ A gouty person bathes, and is hurt by
 “ bathing; the fact is related to a phyfi-
 “ cian at a distance, he concludes, *That*
 “ *bathing in gouty cafes, is wrong.* The
 “ Physician on the spot saw this per-
 “ son bathe, he observed that he was in a
 “ very unfit state, that he went in with-
 “ out due preparation, that he staid in too
 “ long, that he continued a diet very im-
 “ proper. All that the last concludes is,
 “ *That improper bathing is a dangerous thing.*
 “ He still holds his opinion, That bathing,
 “ in gouty cafes is a right thing : but these
 “ two doctors must differ, till he who lives
 “ at a distance, is informed of the circum-
 “ stances of the fact.

“ Sick people who come to bathe for the
 “ Gout, or to drink or bathe at this, or any
 “ other Mineral Water Place, believe that
 “ they come for the use of the Waters on-
 “ ly. They look upon the slightest prepa-
 “ tion as loss of time, they grow impati-
 “ ent, they plunge into Baths *improperly,*
 “ they

“ they hearken to every idle tale. Men of
 “ gross habits, and unsound viscera; and
 “ others emaciated, weakened, and dispi-
 “ rited, worn down by hectics, and colli-
 “ quative discharges, stand in need of the
 “ full exercise of their reason, if they put
 “ any value on health or life.

Dr. JAMES, in the introduction to his
Pharmacopœdia Universalis, says,—“ Cuf-
 “ tom and the Legislature, in imitation of
 “ all civilized nations, have wisely provid-
 “ ed for the interest and health of the sub-
 “ ject, by assigning to distinct bodies of
 “ men, their different provinces in physic;
 “ both because each branch is sufficient, to
 “ engross the whole attention of any one
 “ man, and because every division is a sort
 “ of check upon the other, so as to guard
 “ against the effects of avarice and artifice.

“ THUS, the *Druggist* is restrained from
 “ providing bad materials, by the know-
 “ ledge of the *Apothecary* who is to pur-
 “ chase them.

“ AND,

“ AND, as an encouragement to industry
 “ and integrity, the *Apothecary* is indulg-
 “ ed in several privileges denied to other
 “ callings; custom has, besides, allowed
 “ them extraordinary profits. But lest
 “ these indulgences, should defeat the end
 “ for which they were intended, it was
 “ prudently provided, that the vender of
 “ medicines should not have the direction
 “ of their use, lest private advantage, should
 “ influence him to load his patient with
 “ medicines, to the ruin of his health and
 “ fortune.

“ THIS trust therefore, is entirely repo-
 “ sed in the Physician, who is supposed
 “ to have the advantage of a generous and
 “ liberal education, which, naturally, in-
 “ fluences the morals, and biasses men less
 “ to gain, than those who are bred to me-
 “ chanical professions. But, as all men
 “ are frail, he is justly restrained from vend-
 “ ing the medicines which he prescribes.

“ FROM considerations no less prudent,
 “ have civilized nations divided *Surgery*
 “ from

“ from *Physic*, and assigned to the *Surgeons*
 “ the executive part in all external disor-
 “ ders; reserving, mean while, to the
 “ Physician, the province of directing in-
 “ ternally; thus the patient is better se-
 “ cured against error and avarice.

“ IN the situation of *Physic*, as it now
 “ stands in *England*, distinctions are con-
 “ founded and destroyed; and perhaps,
 “ no abuse challenges more the interposi-
 “ tion of the Legislature. The *Chymist*
 “ compliments his customers, with the
 “ refuse of drugs: And the *Druggist*, by
 “ way of retaliation, furnishes his with
 “ chymicals equally bad. The Apothe-
 “ cary commences a most contemptible
 “ Surgeon. The *Surgeon* professes *Phar-*
 “ *macy*, with the same degree of know-
 “ ledge and success: And both (in spite
 “ of *reason* or *education*) are by a kind of
 “ Magic, peculiar to themselves, convert-
 “ ed into most execrable doctors. It now
 “ only remains, that Physicians should
 “ become very bad Apothecaries, and then
 “ may

“ may we expect to see medicine practis-
 “ ed with less safety, than among the sa-
 “ vages of *America*.

“ I SOLEMNLY declare, that I now plead
 “ as a member of society, private interest
 “ has with me no sway; I am convinced,
 “ that the present confusion of Physic, im-
 “ poses a tax on the public in favour of
 “ Physicians, to the amount of many thou-
 “ sands of pounds annually.

“ ACUTE distempers are easily cured,
 “ while strength remains to co-operate
 “ with medicines; but, when time has
 “ been lost, by trusting to men who know
 “ only to fawn and trifle; when nature
 “ has been disturbed, by purging off hu-
 “ mours unconcocted; when sweats have
 “ been forced by unseasonable cordials;
 “ when the disease has been weakened, by
 “ the unseasonable use of the lancet; the
 “ constitution becomes injured so much,
 “ as to require six times the attendance,
 “ and the deluded patient has more than
 “ common

“ common good luck, if he escapes the
 “ fiery trial, with life; or, at best, a
 “ constitution ruined for life.

“ *So modern 'Pothecaries taught by art*
 “ *By Doctors bills, to play the Doctors part,*
 “ *Bold in the practice of mistaken rules,*
 “ *Prescribe, apply, and call their masters*
 “ *fools.*”

Says Mr. POPE.

Dr. FRED. HOFFMAN was a Physician, a Chymist, and a Philosopher; he was well versed in every branch of knowledge, the subject of which is the *human frame*; his criticism may serve to convince the reader of the necessity of being particular, on a subject of the highest importance.

“ It is to be lamented (says this judicious
 “ enquirer) that, of the vast number of
 “ Physicians, so very few should understand,
 “ the powers and effects, of the medicines
 “ which they prescribe. Of this truth, we
 “ have a signal instance in the business of
 “ Mineral Waters, which, tho' famous for
 “ so

“ so many ages, and recommended by
 “ thousands of eminent examples, are, ne-
 “ vertheless, discredited by the ignorance
 “ and unskilfulness of Physicians.

“ No less preposterous has been their
 “ manner of prescribing Waters, which they
 “ do in the perfect manner of *Empiricism* ;
 “ so that Mineral Water Places, seem the
 “ principal, and more immediate seat of
 “ *Quackery*.” — Thus freely has the Doc-
 tor expostulated with his brethren. What
 would he have said, had he lived in a coun-
 try, where Dr. JAMES’S complaint held
 true? — But to proceed.

THE body of man is an organic-machine,
 consisting of Solids and Fluids, so combin-
 ed, as to form an entire System, capable of
 producing certain operations called Animal-
 Functions. For the preservation of life,
 there ought to be kept up a due Equilibrium:
 If the vascular fibres become too rigid, the
 Vessels will contract with violence, the
 blood’s motion will be encreased, the hu-
 mours

mours will be changed from their natural bland state, into an acrid exalted one; hence Fevers, Hæmorrhages, Fluxes, &c.

If, e, c, the force of the Fluids surmount the elasticity of the Solids, the Vessels will be enlarged, and relaxed; hence stagnation, obstructions, &c.

Dr. PITCAIRN has laid it down as a Maxim, that due Secretions from the Blood, are as necessary for the preservation of health, as the circulation itself.

THE greatest part of CHRONIC DISORDERS, arise from one or either of these two causes. The blood is either too thin, and then it is separated in too great a quantity, by the glands, of the skin, guts, or kidneys. Or, it is too viscous, and thus occasions obstructions in the glands, and in its own canals.

THE surface of the body, as well as its internal cavities, are covered with a transpirable membrane, replete with exhaling pores,

pores, through which continually and insensibly, transcends a subtile effluvium or vapour; so small are these pores, that LEWENHOCK computes that 125,000 of them may be covered with a grain of sand, whose diameter is $\frac{1}{1000}$ of an inch, and yet so numerous, that SANCTORIUS found, that in *Italy*, in a healthy person, this secretion amounted to $\frac{5}{8}$ of all the sensible excretions: KEIL and LISTER compute it in *England*, to be, at least equal to them all put together.

IF the pores happen to be obstructed, the skin grows dry, the vessels become impermeable, the humours regorge; thus there arises a Plethora, as well as an Acrimony; nature is obliged to ease herself of her load by the increase of some of the sensible Evacuations; hence Vomitings, Fluxes, Hæmorrhages, pale Urine, &c.

THE primary Indication in the cure of chronical distempers, is to render the circulation free and easy.

FOR the attaining this purpose, four things seem necessary.

FIRST, To resolve the impacted humours.

SECONDLY, To correct the degenerated state of the blood.

THIRDLY, To expel the peccant matter.

FOURTHLY, To relax the too rigid, and strengthen the relaxed fibres.

ALL which require skill and judgment. We have already considered the different ingredients which constitute Bristol Water, and have enumerated their virtues separately and collectively.

FROM this general idea it cannot be hard to conceive after what manner Bristol Water acts in the cure of distempers.

By its tepid subtle *Fluid*, it resolves, rarefies, quickens and enlivens the drooping circulation, it removes all crispations of the solids, and restrains the rapidity of the blood, corrects acrimony, cleanses the stomach and intestines, and corrects foul and
viscid

viscid juices ; thus it restores appetite and digestion. And when it gets into the circulation, it diffuses itself thro' the whole habit, and reaches to the most minute capillary vessels.

IN this, and the preceding Chapter, I have accounted for the *Modus Operandi* of Bristol Water, in such a manner, as will, I hope, abundantly satisfy the physical reader, who, by living at a distance, has not the opportunity of satisfying himself by experiments; I pretend not to instruct Physicians in any other sense.

To inform Patients, of what belongs to their own interest; I have premised a short, and plain account of the Animal-æconomy, I have slightly touched at those causes of error, which seduce the unwary. I proceed to point out the virtues of Bristol Water in those particular disorders, in which it is said to act *specifically*.



T H E

Virtues of Bristol Water,

I N

PARTICULAR DISEASES

 C H A P. VII.

WHEN the reader has duly considered the causes of error and uncertainty mentioned in the last chapter, he will hardly expect to see rules laid down for the drinking of these waters, which can suit every constitution, disease, age, or sex. Physicians reason differently, according to the difference of their judgment, sagacity or education. The art of physic is, at best, but uncertain. The ignorant

norant cure sometimes, tho' they know not how. The rational practitioner proceeds on rational principles; by his practice, he makes it appear, that the virtues of Medicines depend not more upon the remedies themselves, than upon the disposition of those bodies, on which they are intended to act. When he directs the use of Mineral Waters, he knows the necessary circumstances, and particular cases, in which they may, or may not be serviceable, he lays down rules which tend to a certain issue. Waters which contain salutary particles, contain also those that are noxious; life and death are in the hands of him who gives advice; the simplest nostrums do mischief, improperly applied.

“PATIENTS (says Dr. *Oliver*) instead of
 “ following the rules laid down for their
 “ conduct, torment themselves continually
 “ with doubts and scruples: by hearkening
 “ to the opinion of every pretender, they
 “ come to have none of their own to act
 “ by. They trifle away their whole time

“ in a fruitless search after what they
 “ should do, instead of doing what they
 “ ought, till at last, finding they receive
 “ no benefit, or are worse than when they
 “ came, they condemn the Waters, and
 “ quit them in disgust.”

HE who expects to find relief at this spring, must submit to a long course of attendance, he must arm himself with a stock of patience and perseverance. To these he must join temperance of every kind.

MEATS of all kinds, young and easy of digestion, are the most proper DIET, with *Milk* in all shapes: Milk is already elaborated, prepared and digested in the body of the animal, it is replete with nutritious particles, and wants little else, but the colour to be blood. But, above all, *Butter-Milk* where the febrile-heat predominates: This was strongly recommended in all inflammatory cases by the Great BOERHAVE; this and *brown bread*, was his own constant diet: this every thinking Physician must see
 the

the utility of, and yet, in this Kingdom, it becomes the food only of hogs.

For drink at meals; I would recommend Bristol Water brought from the Well, some hours before; the bottles standing uncorked, or warmed in a vessel of hot water, with the bottle also uncorked. A little wine may be mixed with it, but no wine is better. The practice of drinking tea twice a day, or even once, is absurd, it answers only one purpose, that of rendering the virtues of the Waters less effectual.

Few preparations are necessary to the drinking these waters; but their virtues are greatly encreased by medicines duly administered.—The Passions must be kept within bounds, every excess exasperates the distemper, and hinders both the first and second concoctions.

THE sanguine, the florid, and the plethoric, may bear Evacuations; while the thin, the pale, and the phlegmatic may be

hurt by almost any. Purges of the rougher sort, destroy the tone of the stomach and bowels, the waters pass not so easily, on account of that stricture which all purges leave behind them. Where the guts are clogged with a gross viscid phlegm, lenient purgatives are necessary to open the mouths of the vessels, and so give access to the fluid. *MAGNESIA ALBA* is much used with Waters abroad, especially in costive habits; I know no purge so natural to these Waters as this; its purgative quality seems to proceed from its alkaline, earthy matter, dissolved by the sharpness of the juices, and the remains of the aliment in the first passages, so as to degenerate into a neutral salt, which exerts a purging quality, similar to that prepared with the white *Manganese* and *Spirit of Vitriol*, on which principle, the common *Epsom salt* is proved to act.

VOMITS in general seem to be a more natural sort of preparatory evacuation, but these must be given with caution: where
the

the *viscera* are unfound, they are often attended with great danger.

BLEEDING may be a necessary preparative to those who sport with the Waters, or drink them, because they would not be out of the fashion. But in many disorders in which, this Water is indicated, *bracing* and *strengthening* seem to be indicated. In inflammatory fixed pains, or in giddiness or plethora brought on by the use of the Waters, it may however, be necessary.

MODERATE EXERCISE, particularly RIDING, greatly facilitates the operation of these Waters. The sea-air also refreshes and strengthens the lungs of all, but more remarkably of those who have been accustomed to an Inland-air; but this exercise, should, on no account, be protracted beyond the strength of the sick. In those cases in which the Water is expected to pass by Urine, sitting still, or walking moderately, will better conduce to the purpose; because riding promotes other secretions; which,

which, consequently, diminish this.—
DANCING is a good exercise, provided the lungs are sound, and no febrile heat.

WE NOW proceed to those diseases, in which experience has ascertained the efficacy of these Waters. And here, we may observe, in general, that whoever has duly attended to what has already been advanced on the virtues of the substances or principles contained in the Waters, will be as little at a loss to account for the operation of these Waters in particular diseases, as he who understands the doctrine of *inflammation*, is to account for the operation of medicines in *Acute diseases*.

I. DISORDERS of the LUNGS.

IN simple Inflammations, the common methods of bleeding, blistering, &c. seasonably applied, seldom fail of success. If, in this stage of the distemper the patient applies to these Waters, the feverish heat which irritates the lungs, is quickly subdued,

duced, the teasing cough, and all the other symptoms cease of course.

WHEN, by ignorance or neglect, the inflammation comes to degenerate into *Pus*, and forms ulcers, the constant motion of the lungs in *Inspiration* and *Expiration*, together with the *Cough* hinder them from cicatrizing: the *Pus*, by stagnating, acquires an *acrimony*, is absorbed, and carried into the circulation: thus the whole mass becomes tainted, the blood is melted down into an ichorous corroding serum, which runs off by the lateral vessel in colliquative discharges; a *Hætic Fever* is produced, which encreases these discharges: the body is not only emaciated, but cannot be nourished, as the blood is robbed of its bland balsamic quality: the neighbouring parts partake of the inflammation, till, at last, the whole substance of the lungs comes to be in a flame, and, then melted down into *Pus*, which fills the *Bronchia*, as well as the cavity of the *Thorax*.

THE

THE lungs are, besides, subject to a *Peripneumonia Nottha*, which is a defluxion of viscid phlegm, compressing the aerial, as well as the blood vessels.

THE lungs are covered with an infinitude of glands; when these become obstructed, tubercles are formed, which, encreasing in size, hinder the action of the lungs, and bring on a cough, catarrh, &c.

IN a *Peripneumonia*, where the pulse is firm, it is a good sign, it denotes that the circulation is free in the extremities of the Pulmonary Artery.——But when it comes to be what is called *Pulsus undosus*, it denotes an abscess in the lungs.——
When the head comes to be affected; as also, when the patient complains of loss of sight, without any fault in the eyes, *Hippocrates* remarks, that this denotes a translocation of matter to the brain, and is, generally fatal.

IN a *Peripneumonia*, contrary to inflammations

mations in all other cases, the worse the disease, the weaker the pulse; the reason is, that there is a greater obstruction of the Pulmonary Artery, the passage from the right to the left Ventricle is obstructed, and though the heart contracts as usual, the same quantity of blood is not sent through the body.

WHEN temperance, regimen and art have been all three baffled; when Patients have been reduced to the most deplorable state; when consuming heats, and colliquative Sweats have reduced the Body to the shadow of a Man: Bristol Water has (by its *fluid* and *volatile Acid*) subdued that FEVER which nourished the Disease, as well as corrected that putrescency which vitiated the Blood. Its penetrating and deobstruent *Salts* have dissolved that viscid *mucus* which choaked the *aereal* Vessels, and reduced those Tubercles, which by their unnatural increase, impeded the action of the Lungs.

IN a *Phtisis Pulmonica* proceeding from
the

the latter, Crude-Mercury, expectorating and attenuant Gums, in doses too small to purge, with diuretic Balsams and Asses milk, have greatly promoted the efficacy of the Waters.—The EARTH, by its absorbent quality, has corrected that acrid humour which vellicates the nervous coat of the Intestines, and has safely stopped colliquative fluxes, whilst *Opiates* and *Astringents* exerting their power upon the Lungs, as well as upon the Intestines, have stopped expectoration and endangered suffocation. The Waters thus assisted have filled the Vessels, with their native, benign, balsamic liquor, and fresh lustre, has again sparkled in the Eyes.—Many examples might be produced in proof of this assertion, let one suffice, which is still fresh in the memory of most people at the Wells.—” From the
 “ dregs of the *Small-Pox*, Miss L. a young
 “ Lady of *Birmingham*, was attacked with
 “ a Consumption of the very worst sort,
 “ she came to this place in February, quite
 “ emaciated, with profuse Sweats, and
 “ other

“ other colliquative discharges: there was
 “ emptied, every morning, almost a basin
 “ full of matter of an intolerable stench,
 “ she drank the Water for six weeks with-
 “ out the least visible amendment; after
 “ this she recovered daily, so that at the
 “ end of the second six weeks, she was per-
 “ fectly recovered, excepting a dry teasing
 “ Cough, which, yielded to little bleed-
 “ ings; the Water however, seemed rather
 “ to increase this remaining symptom. I
 “ advised her to return to her home, recom-
 “ mending two or three glasses of Spring
 “ Water, acidulated with *Elixir-Vitriol*, to
 “ be drank every day, and Butter-milk with
 “ Riding; which under the judicious care
 “ of her Physician, Dr. *Ash* will (I hope)
 “ avert a relapse.”

OUGHT we not to set the highest value
 then upon a remedy, so easy, and so effec-
 tual in a country where CONSUMPTIONS
 may be said to be almost *Endemical*?—
 Irregularities, Infection, translocation of mor-
 bific matter, mal-conformation of the
 parts

parts, &c. often produce this Disease. But the most common of all causes is COLD.—*Frigus genitor est Pthiſeos pulmonalis, ſcilicet venulis a frigore conſtructis & convulſis*, ſays HIPPOCRATES.—*Frigida pectori ſunt inimica, tuſſes movent, catarrh excitant.* Id. Aph. xxiv. Sect. 5. Cold is the ſource of thoſe conſumptive pulmonary complaints, which carry off multitudes daily: to which the inhabitants of this iſland are daily expoſed, on account of the inconſtancy of the weather, and the uncertain viciffitudes of the ſeaſons. Agreeable to this is that Aphoriſm of SANCTORIUS, “*Cauſæ externæ quæ prohibere ſolent perſpirationem, ſunt Aer frigidus, cænoſus, humidus, &c.*”

THE inſide of the wind-pipe and lungs, is lined with a perſpirable membrane expoſed to the external air, through this there exhales continually, a ſubtile vapour, ſeparated from the blood. SANCTORIUS, by collecting the drops on a mirrour, found the quantity exhaled by reſpiration,

to

to amount to half a pound in one day. LIS-TER thinks the calculation too low, he computes it at one fifth of the whole, *i. e.* near a pound : No wonder then, that when the mouths of these exhaling vessels are, by the sudden application of an intense COLD constricted, the perspirable matter is fixed, condensed, and converted into pituitous phlegm, causing inflammations, fever, &c.

MEDICINES duly administered, have often kept the Waters in the right path, when they would have strayed ; they have, often, claimed a due share of the prize : mild balsamics have blunted the acrimony of the fluids : Asses-milk has, attenuated and nourished, whilst butter-milk, by its *acidity*, has subdued the putrescency of the Juices, and acted as an excellent febrifuge, keeping the belly, at the same time, open ; a happy circumstance in a consuming hectic.

ISSUES have been of singular use in fixed

I

pains,

pains, and inflammations; their perpetual drain not only relieves the part affected, but also carries off a part of that acrimonious humour which vitiates the fluids: they have restored emaciated limbs to their pristine strength and size, and plumped up bodies enervated and wasted by colliquative discharges.

SETONS, in disorders of this kind, I would prefer to all the rest: and here, experience vouches the doctrine so fully, that the following cases may not be impertinent.

“ Mr. H. of *Marlborough*, of a fair complexion, and delicate habit of body,
 “ much subject to hectic heats, &c. threw
 “ up from his *lungs*, at different times,
 “ matter to the quantity of several quarts;
 “ the symptoms of a fresh abscess were
 “ familiar to him, and then it was that I
 “ first visited him: he had taken variety
 “ of pectoral medicines, and lived always
 “ temperately: I advised him to put a Se-
 “ ton

“ ton between the ribs, just above the in-
 “ fertion of the Diaphragm, and near the
 “ part where he felt the pain. His symp-
 “ toms vanished, he has enjoyed perfect
 “ health now for nine years, and his con-
 “ stitution is much altered for the better.”

“ Mr. B. a working Silver-smith of
 “ *Covent-Garden*, came down to *Bristol*,
 “ much emaciated by an eruption of pure
 “ blood from his lungs, which had con-
 “ tinued, at different times for ten years,
 “ and rendered him incapable of pursuing
 “ his calling. By my advice, a Seton was
 “ put in his side, which, without the as-
 “ sistance of the Waters, or any other me-
 “ dicine, recovered him to such a degree,
 “ that ever since (and now four years are
 “ elapsed) he has not lost one day’s labour,
 “ and has become fat and strong.”——He
 has such faith in his cure, that as soon as
 the Seton cuts through the skin, he has a
 fresh one put in.

SEA-VOYAGES have performed wonders

in consumptions : whoever reads Dr. GILCHRIST'S accurate collection of histories of this sort, will no longer doubt the fact.—It is notorious, that young lads of delicate puny constitutions, grow strong and hardy, by being at sea.—Men have left *England*, with all the symptoms of a phthisis, they have recovered on their passage to the *West-Indies*, living, mean-while on the ship's provisions, and doing the duty of private men. Something, doubtless, was due to the exchange of an inconstant climate, for one where reigns an eternal warmth and serenity.

II. HÆMORRHAGES of all Kinds.

IN a HÆMOPTOE or Eructation of pure blood from the lungs, the juices acquire an acrimony from *Inanition*, the blood being robbed of its balsamic parts. If this continues, a putrid Hectic-fever is the consequence. Thus, in Monasteries, the *Religious* who observe a strict abstinence, die of fevers; the juices, for want of fresh chyle, acquire

acquire a putrescency, which corrupts their breath, and circulating in the capillary vessels of the brain, turns them mad. Thus it fares with women who give suck, if they fast too long, their milk tastes strongly of urine. This also, is the reason, why sick people are generally peevish.

IN a Hæmoptoe, a part of the blood remains behind in the Bronchia, or aerial vessels: by stagnating, it naturally acquires a putrescency, it becomes ichorous and thin, it enters the mouths of the absorbent vessels, and so is carried into the circulation, where it infects the blood; these preludes generally end in a consumption.

By the difficulty of breathing, by shiverings, &c. we pronounce an impostumation.

IF this distemper is taken in time, Bristol-Water with repeated venesection, rest, and a cooling diet bids fair for a cure. The Waters (as we have shewn at large) have a

specific quality in subduing the febrile heat, and lessening the momentum of the blood; the ruptured vessels have time to cicatrize, and a cure is often found.

HÆMORRHOES are frequent among women, nor are they so alarming: they generally proceed from an obstruction of the menses. The cure is performed by prescribing *Emenagogues* about the time of the next eruption; if this succeeds, the disease vanishes.

IN immoderate fluxes of the MENSES, a Hectic-fever necessarily supervenes, hence loss of strength and appetite, paleness, and swelling of the ankles. The cure is performed by the *volatile acid* and *absorbent earth* wonderfully blended together in the *subtile fluid*.

IN the HÆMORRHOIDS or PILES; in HÆMORRHAGES of the URINARY PASSAGES, as well as DYSENTARIES or BLOODY FLUXES, the Waters act as before related.

III. D I A B E T E S.

ARÆTEUS was the first who gave any tolerable description of this disease. He calls it, “ A flux of humours from the
 “ veins, a colliquation of blood, and con-
 “ tinual effusion by the kidneys and
 “ bladder.”

ITS symptoms are, a copious and frequent excretion of a pale-coloured tasteless urine, frothy and white spittle, parchedness of the mouth and throat, feverish heat, anxiety and inquietude, wasting or atrophy, a fulness about the loins with an irresistible desire of making water, great thirst ; the Water in time becomes sweeter, with an ardent fever, delirium and death. These symptoms vary according to the cause, or violence of the disease.

THE causes are, whatever *relaxes* or weakens the *urinary vessels*, or dissolves the *crasis* of the blood. WILLIS mentions one contracted by drinking Rhenish wine too freely. LISTER another, from the too

plentiful use of Knaresborough water, as also another from the too free use of balsam of Capivi. Large and sudden evacuations, lingering distempers, low diet, excess of Venery, immoderate use of punch, the stoppage of other secretions, especially *insensible perspiration*, which occasions a temporary Diabetes in Hysterical Women and Hypochondriacal Men. Whatever, in a word, destroys the equilibrium between the solids and the fluids.

THE humour discharged in a Diabetes, differs from urine in its colour, taste, and smell. It seems to be an afflux of Chyle little altered by circulation. “ The urine
 “ of a person labouring under a Diabetes,
 “ coagulated into a glewy mass, like the
 “ white of an egg, or the serum of the
 “ blood before the half was evaporated over
 “ a slow fire.—The same quantity of
 “ the urine of a person in health, evapo-
 “ rated almost entirely, leaving only a little
 “ fetid sediment behind.” DR. KEIL
 made the experiment.

THE

THE Diabetes is tedious in the cure, and often fatal, because the Patient does not soon discover his disorder. The cure must be adapted to the cause.—“About ten
 “ years ago, I cured a Tobacconist of the
 “ *Devizes* of one of long standing, and the
 “ worst symptoms, with one prescription of
 “ a Decoction of Bark, Rhubarb, &c.”—
 Others less alarming have resisted the power of Medicine as well as Bristol Water.

THE Indications of cure, are

First, to avert the flux of humours from the Kidneys.

Secondly, to remove those obstructions, which impede the other secretions.

Thirdly, to strengthen the Renal-vessels, as well as the whole system.

DR. HARRIS called a Diabetes, a Diarhea of the Kidneys, and indeed, these diseases greatly coincide in their causes, effects and cure.—HIPPOCRATES says, *Cutis raritas, alvi densitas, & vice versa*, this may be as well applied to the Diabetes as to Fluxes of
 the

the belly. HIPPOCRATES, CELSUS, and Dr. FRIEND observe, that by Vomits, the cuticular pores are opened, and superfluities discharged: *Ipicacuana* is the best. Rhubarb immediately tinges the urine, and is a Corroborant. Diaphoretics, dry rubbing, moderate Exercise, and Cold-bathing may be useful as they are indicated. Without a good *digestion*, there can be no good blood, and without good blood, there can be no found nourishment, nor any cure of a Diabetes.

AMONG all the remedies devised for the cure of this disorder, none bids so fair for the name of a *Specific* as Bristol Water. How it accomplishes this great work, we are now to enquire.

THE volatile ethereal elastic SPIRIT diffuses itself, like electrical fire, thro' the whole body, it opens obstructions, dilates the smallest Vessels, and disposes them for the reception of their proper fluids, it promotes insensible perspiration, and thus averts that unnatural flux to the kidneys.

The SALTS dissolve viscid cohesions, and stimulate the Solids, and thus enable them to throw off the peccant humours by their proper Emunctories.

The ABSORBENT EARTH is endued with a drying, bracing and corroborating quality; when it comes to pass by the secretory vessels of the kidneys, it strengthens their relaxed fibres, contracts their patulous orifices, and thus fits them for the reception of those Juices only, which nature wisely ordained for that excretion.

BUT, above all, the VOLATILE-VITRIOLIC-ACID, incorporating with the *subtle penetrating Element*, mutually co-operate in subduing that Hydra the *Fever*, which consumes the body, and expends its nourishment in unnatural Secretions; this point once attained, Thirst, Anxiety, Wasting and Debility follow in its train; the Secretions all recover their proper Outlets, the Chyle is duly assimilated, the blood acquires its wonted nutrient property, and the body becomes

becomes again fit for performing all its functions.

WHEN, I say, the subtilty of the *spirit*, the penetrancy of the *salts*, the restringency of the *earth*, and the anti-putrescency of the *acid*, come all to be blended together, by the wise Chymistry of nature, in a warm soft, and subtle *fluid*, they, thus united, exert a force incomprehensible to our poor researches. Bristol water has this peculiar quality in this disease, that let it be drank in any quantity, it promotes not that unproportionable discharge, which all other liquors do. Happy tidings to the desponding patient, whose tongue is parched with thirst unquenchable!

IV. GRAVEL and STONE.

As a Diuretic, these waters act specifically and naturally; they correct acrimony: They disjoin and wash away gravel where it is accumulating, they also prevent its resuscitation, by strengthening the Urinary-passages:

passages: they enable them to throw off at once, what might, by lodging, prove noxious; agreeable to that judicious observation of Dr. *Fred. Hoffman*, “*Toni renalis nimia*
 “*resolutio, Morborum qui reneis occupant,*
 “*potissima causa, et origo est.*—*Qua de*
 “*causa, temperata Astringentia et Roborantia*
 “*in Calcula tam preservando, quam curando*
 “*palmum cæteris arripiunt.*”

WHERE there is actually a stone lodged in the Kidneys, ureters, or bladder; these Waters allay heat, dilute acrimony, and wash away fresh accretion of fabulous matter. In an actual fit of the stone, a Man of sense would avoid these, as he would all Diuretics.

IN INFLAMMATIONS and ULCERS, by allaying the febrile heat, and tempering the acrimony of the Urine, they cool, cleanse and cicatrize.

V. GLEETS.

ANATOMICAL DISSECTIONS teach us, that obstinate Gleet in MEN, take their rise
 from

from the unskilful *cure* of venereal disorders, which corrode the *Poestate Glands*, and render them schirrous and fistulous. These also take their rise from an ignorant perseverance in purging Medicines.

IF there remains nothing of the venereal taint, BRISTOL WATER aided by Balsamics, will subdue the Hectic heat, open the obstructed Glands, wash away the tainted Juices, consolidate and cicatrize the Ulcers, and strengthen the relaxed parts.

WHERE the lungs are affected by a venereal taint, or by the improper administration of Mercurials or Purgatives; where Cough, Sweatings, &c. the forerunners of a Consumption have appeared; these Waters have stopped its career, the symptoms have abated, and time has been given to throw in (with prudence) such anti-venereal Medicines, as have removed the infection, while the Waters have rescued the Patient from the grave: of this fact we have daily proofs.

VI. FLOUR ALBUS.

IN WOMEN, this disorder, sometimes, proceeds from an acrimonious humour infecting the Glands, and corroding the adjacent parts; as also from a relaxation of the orifices of the Vessels of the Uterus or Vagina. It is sometimes caused by falls, sprains, and sometimes by other accidents.

MANY have borne up under this disease for years; sometimes it is attended with darting pains, excoriations, and ulcers; it occasions weakness, loss of appetite, indigestion, sometimes an obstruction of the *Catameria*, and sometimes, too great a discharge. It is generally attended with a fever, and an absorption of *pus*, the one wastes and consumes the body, the other contaminates the Juices.

THE cure must be adapted to the cause, and as this differs in different Patients, and different constitutions, as well as stages of the disorder, it would be needless here to repeat

peat, what we have so fully illustrated in other places, as well as in the last section; concerning the *modus operandi* of these Waters. In general, we may affirm from experiment as well as experience, that in many cases, BRISTOL WATER will be found a specific: and, in almost all, it will relieve, where it cannot cure.

VII. S C U R V Y.

THIS disorder is frequent among people who live on viscid indigestible food, as well as among those who live luxuriously, and use too little Exercise. It brings along with it a train of Evils too long to be enumerated in a work of this kind.

THE principal Virtue of BRISTOL WATER in this disorder, seems to consist in diluting, as well as washing away those acrid saline particles, which corrode the Solids, and vitiate the Fluids; this it owes to its pure Element; its other ingredients open obstructions of all sorts, particularly of
the

the Miliary-glands, insensible perspiration is restored, by which those Juices which by being detained in the body, acquired an acrimony, are excreted by their proper Emunctories, and a due Equilibrium is restored between the Solids and the Fluids.

VIII. RHEUMATISM and GOUT.

HABITUAL GOUTS, Rheumatic and Arthritic pains, may be much relieved, if not absolutely cured, by a proper use of these Waters, diluting the gross, impacted humours, and restoring the secretions. They bid fair for correcting the habit, dissolving the morbid matter, and eliminating it thoroughly out of the body.

IN those Constitutions, in which the Gout seems to be interwoven with the constitution, where a fit of the Gout is wanted, so as to draw the morbid matter from the head or stomach, there is no Medicine equal to the BATH WATER.

IX. COLICS.

IN scorbutic Colics, which are owing to the acrimonious matter twitching the nervous fibres, and irritating them into painful contractions, Bristol Waters act in the manner as described in the Scurvy.

IN convulsive Colics, they have succeeded beyond expectation, after all other remedies had been tried in vain.

X. FLUXES.

AFTER what has been advanced on the virtues of the PRINCIPLES contained in the Waters separately, as well as in particular diseases, it would be impertinent to trouble the reader with their power in a DIARRHEA, this is always attended with a Fever, which the volatile *Acid*, blended with the *Fluid* bids fair to remove, as well as to dilute that acrimonious humour which twitches the intestines: the earth, joined to these, acts as a strengthener.

THERE

THERE are many other complaints which they daily relieve, such as HOARSENESS, WANT of APPETITE, INDIGESTION, &c.

FROM what has already been slightly glanced at, rather than *systematically* handled, We may fairly and rationally conclude, That as MINERAL WATERS in general, so BRISTOL WATERS in particular, are of such EFfIcAcy, for the *preservation* of health, as well as the *cure* of Diseases, as in the highest degree, to exceed all *Shop Remedies*, and that they approach the nearest in nature to what has vainly been searched after, AN UNIVERSAL MEDICINE.

F I N I S.



There are many other complaints which they daily relieve, such as Headaches, Want of Appetite, Indigestion, &c.

From what has already been slightly glanced at, rather than *ostentatiously* bragged, We may fairly and rationally conclude, That as MINERAL WATERS in general, so BRISTOL WATERS in particular, are of such Efficacy, for the preservation of health, as well as the cure of Diseases, as in the highest degree to exceed all *other* Remedies, and that they *not* reach the heart, in nature, what has vainly been searched after. An Universal Medicine.



