

A treatise on diluents, and an enquiry into the diseases of the fluids of the human body, to ascertain the operations of diluents upon them ; with dilution practically applied to particular diseases, wherein the efficacy of mineral waters is considered.

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A
TREATISE ON DILUENTS,
AND
AN ENQUIRY INTO THE
DISEASES OF THE FLUIDS
OF THE HUMAN BODY,
TO ASCERTAIN THE OPERATION OF DILUENTS UPON THEM.
WITH
DILUTION PRACTICALLY APPLIED
TO PARTICULAR DISEASES:
WHEREIN THE
EFFICACY OF MINERAL WATERS IS CONSIDERED.

TO WHICH ARE PREFIXED,
OBSERVATIONS UPON COMMON WATER,
AS FAR AS IT RESPECTS THE SUBJECT OF ATTENUANTS.

BY THOMAS JAMESON,
SURGEON OF HIS MAJESTY'S NAVY.

Αριστον μέν ὕδωρ.

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T O

Sir GEORGE BAKER, Bart.

PHYSICIAN TO THEIR MAJESTIES,

PRESIDENT OF THE COLLEGE OF PHYSICIANS,

A N D

FELLOW OF THE ROYAL SOCIETY.

S I R,

THE Learning and Labours which have so justly entitled you to the exalted Rank and Eminence you hold in the Profession of Physick, have also enabled you to protect the feeble in Science; and as it is the distinguishing Quality of a great Mind, to approve of well-meant Efforts, and to encourage

every Assistance to Knowledge, I am furnished with a sufficient Apology for wishing to stamp a Value upon these Sheets, by prefixing your name to them, and for subscribing myself, with the greatest respect,

S I R,

Your most obedient

and obliged

humble Servant,

THO^s. JAMESON.

Hert-Street, Bloomsbury,

Nov. 1st, 1788.

INTRODUCTION.

PART of the materials of the present treatise I read before a medical society some years ago: from its meeting with the approbation of the society at that time, I am now encouraged to dilate and publish it, in hopes that it may be worthy the attention of the publick, both in respect to the importance and the novelty of the subject.—The doctrine of dilution has been exceedingly neglected by medical authors, and almost entirely overlooked by those who treat on therapeutics, from considering drinks more as a part of diet, than medicine; but even in the view of aliment, drinks should not be disregarded, since they may be made sufficient of themselves,

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selves, in many cases, to cure diseases; and will be a more pleasant remedy, and have a more lasting effect than any other.

In *acute* diseases, the use of drink, and thin diet, is so universal, as a remedy, that the rationale of the practice ought not to be overlooked. It is absurd to see medical men leaving the choice of the quantity, and quality of drinks, to an ignorant nurse, or capricious patient, since in all cases they demand our notice; for example, in the phlegmatic habit, and where there is serous extravasation, or tenuity of the fluids, dilution may become very prejudicial; on the contrary, it becomes of the utmost utility and importance, in youthful and plethoric constitutions, and in febrile, and inflammatory diseases. It is the province of the physician to make this discrimination, as it presupposes a knowledge of the animal œconomy, and diagnosis of diseases, as well as an intimate

acquaintance with the nature of diluents, their power, and operation upon the respective constitutions, to render their use safe.

In *chronic* diseases, also, the practice of the present day seems to turn almost entirely upon the doctrine of dilution; and that the benefit which mankind derive from a resort to watering places, may be more fully understood, an attention to the present subject becomes essentially necessary.

These considerations have induced me, not only to turn the subject in my own mind, but also to recommend it to the attention of all medical men; for although many observations have been, at different times, by various authors, made upon it, no attempt has before been made to concentrate, or bring it properly before the view of the publick.

In this dissertation, if I have not advanced

vanced a great deal of new matter, I have endeavoured, by a new arrangement, to render the subject more perspicuous, and to exchange obscure and antiquated language, for that which is more suitable to the present times.

From the connection of the remedy with every part of the human frame, I have been forced to enter into physiological discussions, and decide upon some controverted opinions, before I could conduct the remedy to its final operation; although the limits of this treatise were hardly sufficient to discuss one of them fully, I have found it expedient to compress the whole into such small compass, as inevitably to cramp my sentiments.

To attempt to explain the effects of the numerous liquids, that come under the denomination of diluents, would involve me in the consideration of our common aliment, which is generally fluid in acute diseases; but as I mean to treat of them,
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with a curative intention, either as a remedy of themselves, or as assisting the operation of other remedies, it will be necessary towards illustrating the subject, and giving the most specific idea of their mode of acting, to confine myself as much as possible to the elementary principle * *water*; since it is the basis of all diluents, their fluidity depending upon the quantity of it present; at the same time, this does not preclude the necessity that sometimes will arise, of considering them in the manner they are often used in the sick room, as containing a portion of nutriment, or any other augmentation, that will render their use more successful and expedient.

There is, throughout the whole creation, for the wise purpose of succession, a constant mutation, or spontaneous ten-

* It is sufficient for the purpose of this treatise, to consider water as an element, although late chymical experiments render that doubtful; which tend to show, that it is composed of dephlogisticated and inflammable air.

dency in matter to perfection, and to decay. In the same manner, as there is now a tendency in a piece of wood to corruption, so there was formerly the same tendency to perfection, while it was growing into a tree. This evolution, which also takes place in the human body, requires a constant change of the fluids, which are naturally inclining to an acrid, or putrescent state; and as it is likewise the property of one matter, to work upon, and change another, the human body would be destroyed, and the living principle extinguished, if it were not for the supply of diluted aliments, impelled into the minutest vessels; which repairs the waste, and removes the redundant parts of the machine; a constant supply of diluents is therefore necessary for existence, even from the first rudiments of the tender embryo, to the last struggles of departing life.

Nature can be supported a long time without solids, but without fluids has a
very

very short duration; on the one hand, the functions of the body can be carried on, without increase of nutritious matter*; for it can exist a length of time on its own nutritious particles, like the turtle on its own fat; on the other hand, if there be a deficiency of fluids, nature will have a precarious tenure, and without them, would very soon perish.

It might be advanced, that our aliment is held forth to us in a diluted form by nature; for milk was not intended merely, for the infantile, but also for the adult state, since in the early ages of the world, mankind lived chiefly upon it; as appears

* The Stirling Castle, of 74 guns, was lost on the Silver Keys, in the West-Indies, in the hurricane of the year 1780: some of the crew arrived on a raft, safe at Jamaica; their existence was supported at sea without food, for many days, by immersing the body in the salt-water, and wetting the clothes with it. In which case, as there could be no absorption of nutritious matter, the body must have been merely preserved by the watery particles keeping up an impletion of the vessels, and preventing putrescency of the fluids.

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from their collecting lactescent animals, and reckoning their riches in proportion to their numerous flocks, which, the scripture says, furnished them with food and raiment: in those days men were longer lived, and healthier than in the present, when great quantities of animal solids are devoured: but I shall avoid, as much as possible, the consideration of them in a dietetic view.

Water is the most ancient, and still the most universal drink, among mankind; and as in the science of medicine it is used either simply in its natural state, or as the component part of all diluents, it will be therefore necessary, before we attempt to account for their action, to consider such properties of this menstruum, as relate to medicine, or render it an attenuant.

W A T E R.

W A T E R.

Water, when free from extraneous matter, is always the same; and the different kinds only vary in having different substances combined with it; therefore has been by philosophers reckoned one of the elementary bodies. All animated nature is formed from it, and respirable air; we see that a plant, and many animals will live on water, and respirable air, grow, and arrive at perfection, by them alone: those animals, which do not apparently live on these, live on other animals which are produced from water and air*: likewise, every sort of animal and vegetable substance, when distilled, affords the same chymical elements†. The materials

* Helmont, Paracelsus, Thales and Boyle, reckoned it the stamen of all things; Sir Isaac Newton said, "that all beasts, birds, fishes, insects, trees, and vegetables grow out of water, and by putrefaction return to water again."

† Both animal and vegetable substances, distilled in a retort, afford empyreumatic oil, volatile alkali, and charcoal.—Dr. George Fordyce's Chymical Lectures.

therefore

therefore being the same, the only difference is, in the manner of combination and organization; and a human body calcined, would leave but a very small portion of solid matter.

Water generally contains extraneous corpuscles, some of which are nutritious; for it affords less nourishment to plants, the oftener it is distilled; and might by this means be rendered unfit for vegetation; therefore, it is more properly called the vehicle of nutritious particles, than the nutriment itself.

The PROPERTY of water that is most obvious and striking, is fluidity. The constituent parts of all fluids, are fine small particles, whose attraction of cohesion is less than their attraction of gravitation; of course they easily move over one another, and naturally assume a spherical figure; although in a congeries they have a smooth surface.

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* This property is the consequence of heat, which has the power of destroying every attraction, and is the agent which gives fluids their form; for both mercury and water become solid by congelation; and without the sun, there would not be any such thing in nature, as water or humidity; the sea and rivers would be dry and hard as a stone, which are now fluid in the heat of the atmosphere. When water is wanted for a diluent, heat may be often employed to augment its fluidity still further.

Except fire, water is the most penetrating of all bodies, for the most solid substances are permeable to it; as was proved by the Florentine experiment †.

This

* Sand has many properties of a fluid, and may be reckoned one, as it is not only moveable, but is in many places of so loose a texture, as to drown a man. Sir Isaac Newton, in the beginning of his Principia, speaks of sand and powders, as of imperfect fluids.

† The Florentine experiment was, water shut up in a

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sphere

This property renders it so powerful a solvent, that it will pass through pores ten times smaller than air will, for it escapes through a piece of leather, or a bladder, that will retain air; its small humid particles penetrating and dissolving the glutinous connection of their fibres, and rendering them more pliable.—The solvent power of water, is the reason of

spherical vessel of gold, then pressed, or hammered, with a violent force, till it made its way through the pores, and wet the ball on the outside; but at length it made a cleft in the gold, and sprung out violently. Many people think this experiment not decisive, in proving the incompressibility of water, as the capacity of the ball was probably much diminished by pressure altering its shape; nor does it prove the elasticity of water, as the elasticity of the gold might be the cause of the sudden eruption of the water. The same experiment has been made by Sir Isaac Newton, and others, with different metals, which are less ductile than gold, and seemingly with the same effect; and Sir Isaac remained of opinion, that not any fluid, in its natural state, was elastic or compressible, except air.—Mr. Canton, on the contrary, made experiments to show, that water was more or less compressible, according to the different constitution of the atmosphere; and Professor Bergman says it is compressible in a small degree.

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its being always loaded with heterogeneous particles; some from their fineness being suspended, and others dissolved in it.

The other properties are, its being colourless, insipid, inodorous, and unflammable.—There are such great diversity of opinions respecting its compressibility, that we are still left doubtful on the subject.

River water will dissolve salt, after which, it will receive a certain quantity of sugar, another of alum, and perhaps other bodies, without increasing its bulk or dimensions, but only adding to its weight; owing to there being certain spaces unoccupied between its particles, arising from their spherical figure; so that when it is saturated with one, it will mechanically receive other substances; after all, will unite with more bodies chymically; and when saturated with fixed air, will dissolve such substances

as it would not otherwise have acted upon.

All these properties unite to render water a most excellent vehicle, for the purposes of the animal œconomy. Its insipidity, and want of smell, render it inoffensive to the senses; its porosity renders it an universal and useful menstruum; its fluidity, the most commodious vehicle for nutritious matter; and its penetrating, and solvent power, the fittest attenuant to enter the small vessels of the human body.

The QUALITY of the water to be used, should be considered as a circumstance of the greatest importance, both for the prevention and cure of diseases; and it was for this reason that Hippocrates paid so much attention to the subject.

The change of air has frequently received the credit of a cure, which was entirely owing to the change of water; and

and many times, unsuspectedly, from the gradual and permanent application of particular waters, chronic diseases, and peculiarity of constitution, have originated, and laid the foundation, in early infancy, of future evil. Many are of opinion, that the large glandular swellings, on the neck of the inhabitants near the Alps, in Switzerland, and of Derby Peak, in England, proceed from the impurity of the water in these countries *; and Dr. Cleghorn observes, that, in Minorca, indigestion, swelled abdominal viscera, obstructed livers and spleens, were produced, both in men and brutes, by the badness of the water.

The most acute diseases, also, very frequently arise from the same cause,

* Three of these inhabitants were shewn in the Hay-market very lately, under the description of the three wonderful *Craws*; they came from the Pais de Vaud, where the disease is called by the French name, *les goitres*; which disease, by some, is attributed to the vallies being humid, from their vicinity to high lands.

such as disorders of the bowels, to which children, and tender constitutions, will be more liable. In hot climates, where greater quantities are drank, and the waters are more impure, this is most evident. Among the sailors in the East and West-Indies, even when they do not go on shore, fevers and fluxes are induced by the water, in proportion to its impurity; and on the coast of Guinea, where the waters are excessively bad, the scurvy, swelled and ulcerated legs, with worms in them, are the common fate of Europeans, whose destiny leads them to that inhospitable shore.

The *salutary* effects of water depend upon its softness and purity. From the clear appearance of spring and pump water, we should naturally be led to give it a preference to rain, or river water, if experience and chymistry had not taught us, that every kind of hard water contains substances which act, not only imperceptibly upon the living fibre, but
likewise

likewise render the water less fit to unite with the fluids, or permeate the small vessels of the machine; we ought, therefore, to endeavour to obtain the softest and clearest water, unless we want it to keep a long time, which the soft water, by containing animal and vegetable impregnations, will not do.

The *softness* may be judged of, from its combining readily with, and not curdling soap; or by its boiling vegetables soft and tender.

The *purity* is to be known by its levity, transparency, insipidity, and want of smell; but by these we are not always able to detect foreign bodies, which it imbibes from the minerals and metals, through which it percolates; which are only discoverable by a chymical test.

It may be rendered *softer*, by adding about eight or ten grains of an alkaline

salt, to a pint; or by adding the salt very slowly, in a proportion, till no more lactescency is produced. Boiling, dropping from a height, exposure to the sun, or ventilating it, in the manner that is done on board of ship by Osbridge's machine, are processes which free it from putrid volatile particles, and render it softer.

Its *purity* may be improved by a few grains of alum added to a pint of water; neither this, nor the aforesaid alkali, will render the water less potable, or wholesome: it may also be rendered purer, and softer, by filtration through a stone or sand. Fermentation does not soften it very much, although it renders it purer; the wholesomeness of malt liquors will therefore depend a great deal on the softness of the water used in their preparation.

Putrescency is the most deleterious quality that water can possess, and arises from
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from the mixture of putrid animal and vegetable substances with it; frequently water appearing perfectly pure, will have a foetid property in a very great degree. There is an animalcule in running waters, which soon dies by keeping, or confining it from the air; then produces so great a foetor, that the water becomes exceedingly offensive, although there is not one animal to a million of parts of the water. The *Thames* water, which does not contain one part of mucilage in five hundred of the water, undergoes a fermentation by keeping; frequently the putrid matter in it generates a quantity of inflammable air, for I have seen the vapour from a cask of *Thames* water, burn for some time, by a candle being brought near it; which water, after it had gone through the acetous, and putrid fermentation, became again pure and clear. All these putrid mixtures may be entirely destroyed, by the addition of unslacked lime, which will also preserve it from
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the putrefactive fermentation ; but as it renders the water unpleasant, and frequently unwholesome, it may again be precipitated from the water, by means of fixed air ; for which purpose a variety of plans have been proposed *.

Water keeps much longer sweet in earthen or stone ware than in glass, and is most apt to putrify in wooden vessels.

Rain, and *snow* water, are preferable to any other natural waters ; and would be perfectly pure, if they did not meet with dust, and other extraneous matters, in falling through the atmosphere ; but it is very difficult to collect them in sufficient quantity for the purposes of life.

River waters are better than hard waters, especially if not taken after great falls of rain, which render them thick

* For the methods of purifying water, there are full, and satisfactory accounts in Dr. Lind, Dr. Alston, and Mr. Henry's publications on the subject.

and muddy ; particularly in hot climates, they often receive from the land, vegetable and animal impregnations, which are productive of diseases; for this reason, the inhabitants of Guinea avoid using the river water immediately after heavy rains.

The most *unhealthy* of all waters, are from stagnant lakes and ponds, which have no motion or springs; and the *best* natural waters are obtained from springs, or currents, on high lands, that consist of pure earth and gravel, and are supplied from the clouds; but the purest of all, is distilled water, after the first runnings are thrown away, and the remainder has stood some time exposed to the air, to remove the empyreumatic flavour, which renders the taste unpleasant, and prevails in a greater or lesser degree, according to the impurity of the water before distillation. I am very glad to see that this water has at length obtained a place in the Pharmacopeia of London.

and readily, particularly in hot climates, they often receive from the land, vegetable and animal impurities, which are productive of diseases; for this reason, the inhabitants of Greece avoid using the river water immediately after heavy rains.

The most common use of all waters, are from stagnant lakes and ponds, which have no motion or change, and the best natural waters are obtained from springs or flowing springs. These are usually of pure earth and gravel, and are supplied from the clouds; but the purity of all is diminished when the first rainings are frozen away, and then the water has stood some time exposed to the air, or is above the surface of the water, which renders the water impure, and prevents in a great measure its being used, according to the impurity of the water before distillation. I am very glad to see that this water has at length obtained a place in the Pharmacopoeia of London.

TREATISE ON DILUENTS.

CHAP. I.

THE THEORY OF DILUTION.

WATER procured pure by any of the aforefaid means, might of itfelf, on many occafions, be the only diluent neceffary in medicine; but as there is a variety of combinations which render it more pleafant, and frequently more efficacious, we muft confider diluents generally, ftill keeping in view the operation and effects of their fluid principle upon the body.

Fluids

Fluids are admirably adapted to every part of the œconomy of the human body. In a healthy state, to prepare the food, dilute the chyle, and fit it to pass the lacteal and lymphatic vessels; also to give fluidity and mildness to the blood, dissolve its saline particles, and carry them off by the various outlets. In a diseased state, to render the small vessels permeable, promote the secretions, and carry off every thing putrid and acrimonious; besides assisting the operation of other remedies, and thereby removing morbid symptoms. The more clearly to understand this, I shall distinguish fluids, as they act in the mouth and fauces, in the first passages, in the circulation, the secreted liquors, and the lymphatic system.

S E C T. I.

IN THE MOUTH AND FAUCES.

ALL bodies must be rendered fluid to make a decomposition take place in them. This being necessary for the use of the animal œconomy, when the aliments are not received into the mouth in a diluted form, nature has provided the saliva for the purpose of rendering them fluid ; by this means to give them taste *, and to fit them for the organs of deglutition and digestion ; therefore, the frequent taking of liquids becomes necessary, as well to recruit, as on many occasions to supply the place

* We generally say that sugar gives water a sweet taste ; but the sugar itself is as insipid as the water, since by applying it to the tongue dry, there is no taste, and it is only by a certain union with liquids that this is acquired.

of this useful secretion. It is for this reason, that nature has implanted in us the sensation of THIRST, to indicate our want of fluid ; not having left it for reason to judge, in a point of so much importance to the preservation of the machine. The influence of this sensation is so great, that however much persuasion may sometimes be necessary to prevail on mankind to use other things that are requisite for their health, there never is wanted much entreaty to make them take drink when they are thirsty.

Although we should not indulge every inordinate appetite, yet it has often occurred, that instinctive appetites have directed us to the best method of cure in diseases ; and we shall find, that whenever the sensation of thirst is present, there are commonly causes existing in the body, which require the taking of liquids ; for this reason, when the serous and thinner parts of the human fluids are exhausted (or the saliva deficient),
either

either from increased motion, or evacuation; and when alkalescency is present, a dryness of the mouth and tongue takes place. These parts being so plentifully supplied with nerves, and the papillæ, especially towards the point of the tongue, possessing such an exquisite sensibility, when the body is debilitated, or otherwise oppressed with disease, the additional irritation of a continued thirst will become so powerful, as frequently to produce watchfulness, delirium, and other dangerous symptoms, if there be not a liberal supply of drink. Temporary cheats, such as acids, brandy, &c. can only increase the secretion in the mouth for a little time; but although they do not satiate the thirst, they very much assist in allaying its irritation; and the concrete lemon and tartareous acids, which are not corrosive, (like the mineral acids) and in a chrystallized form, may be applied with great convenience, in cases where we cannot continually be administering drink.

S E C T. II.

IN THE FIRST PASSAGES.

AFTER supplying the mouth and fauces with fluid, stimulating the salivary glands to excretion, and allaying the irritation of thirst, diluents are accompanied with a compound effect, in the stomach and bowels.

I. Diluents facilitate the *solution*, and promote the *digestion* of the aliment in the stomach. The food being saturated with saliva, and received into the stomach, meets with the gastric liquor, which is not only a solvent, but also a coagulant to detain the ingesta, till by these secretions, and a supply of drink, the stomach is enabled to assimilate various substances into one common matter, the grosser parts of which preponderate,

derate, and the finer and more fluid pass out of the stomach; by these means, water and farinaceous matter are so combined, as to form the fluids and nourishment of the body, and become part of the living animal itself; a certain supply of liquid is therefore absolutely necessary to perform these operations, and a proportionate quantity will very much assist solution and digestion, especially when the stomach is weak, and requires that assistance. In many diseases, the stomach has not power of itself to digest solids; and frequently the saliva and gastric juices are viscid, and in such small quantity, that the food will remain on the stomach undigested, unless a greater proportion of liquor is introduced; for these reasons, Hippocrates, and almost all physicians have ordered thin diet in diseases which are attended with small digestive powers.

II. They lessen the effects of *acrimonious* and *putrescent* matters, by diluting them in the stomach and intestines.

A glassful of cold water will, in the first instance, frequently remove the heartburn: and by diluents obviating the stimulus of putrid or indurated fæces in the alimentary canal, they become highly useful in febrile affections; because any feculent matters lodged in the bowels in these cases, are apt to disorder the whole system. It is seldom that the stomach is quite empty on the attack of fever, and the remaining food is improperly digested; besides, a quantity of mucus is apt to be collected, and a retention of the aliment takes place from debility and want of exercise; which, with increased heat, will render its contents acrid and stimulating, and therefore the application of diluents more necessary.

III. Li-

III. Liquids *accelerate the progress of the aliment* through the intestines. It is found, that the thinnest diet makes the largest and quickest evacuation by stool, by which means less nourishment is conveyed to the system, and the tone of the fibre is diminished; on the contrary, those people who use the most solid food are most nourished, and acquire most strength. A dog that is fed solely on animal food will get fat, but will starve on a like quantity dissolved in water.

It is an old observation, that great water drinking is productive of barrenness, which may be explained in the same way.

The French practice in the West-Indies, of administering medicines in the form of ptisans, is a very good one, especially for purgatives; which always act sooner and pleasanter, in the alimentary canal, with a large proportion of the watery menstruum, when nothing else is

required, than an increased peristaltic motion of the bowels, without any stimulus to, or derivation of fluids from, the rest of the system: besides their brisker action from the bulk of water, their cathartic powers are more uniformly dispersed, over the whole surface of the intestinal canal; the stimulus being less in any particular part, the action is exerted more generally over the exhalents, and a more easy and speedy evacuation produced, than by any stimulating purgative less attenuated.— Among the English, also, in the same climate, from the sudden fatality of the diseases, the practice has become very general, of administering all medicines in a liquid form, to render their action quicker, and give them a more ready entrance into the circulation; at the same time, practitioners recommend a great deal of dilution, to wash off the bile, and other acrid matters from the body.

IV. Di-

IV. Diluents operate differently in the first passages, as they are *hot* or *cold*.

When *cold*, they brace the stomach; and water drinkers are reckoned long lived, not subject to acidity, to have white teeth and good appetites; also in the morbid state, cold water will often check vomiting; and with this view the ancients used it in intermittent fevers.

When *hot*, they have, in a small degree, the power of relaxing the stomach, similar to hot water externally applied; but they have this effect in a much greater degree, when they produce nausea.

From these opposite effects, we should rather administer them hot than cold, in inflammatory diseases, particularly in inflammations of the stomach itself; but not upon the principle of the old theory, that the coldness will produce vis-

idity and obstruction, as no component part of the blood can be altered by the coldness of liquids taken into the stomach, for the Italians use them in fevers, cooled with ice, without any bad, but perhaps good effect.

The only bad effect of cold liquids, will be in the first passages; for whether they are introduced cold or warm, they very soon acquire the same temperature in the stomach; it is true, indeed, that heat and cold applied to the first passages, will produce their relative effects, and these effects will frequently influence the actions of the general system; as a draught of cold water may stop a hæmorrhage, or, in particular situations, induce a shivering fit; but they do not communicate their own temperature to the whole habit, as they are, soon after their introduction into the stomach, reduced to its temperature; so that it is not of so much consequence, as it is commonly imagined,

imagined, whether diluents be used warm or cold, in the generality of diseases in this climate.

S E C T. III.

IN THE CIRCULATION.

THE ardour with which mankind embrace and maintain novel opinions, leads them from that happy mediocrity, which is frequently as useful in science, as it is in the affairs of human life: this we find to have been lately the case with the faculty, who, with a view to explode the once much admired doctrine of Boerhaave, have directed their attention so much to the state of the solids, that they have entirely neglected that of the fluids; which last, from constituting the major part of the human fabric, certainly claim our notice.

I am of opinion that the condition of the body can be changed, by an alteration

tion in the blood ; which may be either too scanty or too abundant ; too thick or too thin ; and perhaps it may be of an acrid nature ; particulars which severally require our consideration, in order to ascertain the effects of diluents.

I. Diluents give tension, or *plenitude*, to the system.

If the vessels of the body were intirely full, it would be impossible that motion could be carried on in them ; for this reason the auricles and ventricles of the heart are alternately empty, and the diameters of the vessels never on the full stretch. In the human body, a set of blood-vessels contains six times more fluid at one time than at another, and is nearly as full with the one quantity, as with the other ; by reason of the elasticity and muscularity of their coats, which furnish them with the power of always adapting themselves to their contents, in order to maintain a certain degree of tension,

tension, necessary to circulation, and to admit a free determination of nervous influence; for on a sudden removal of this tension, by evacuation, or by a change of the blood's distribution, fainting is produced*.

I am of opinion, that we have it in our power to produce different degrees of plenitude in the vessels†; because
we

* An irregularity in this, has given rise to the terms of collapse and excitement; the excess of either being esteemed by Dr. Cullen as morbid causes.

† *Multa mala a nimia plenitudine oriuntur, § 518.—Inopia sanguinis multum quoque nocet, § 526.*

Plenitudo ad spatium vocatur siquando copia sanguinis ejusque mole, nihil præter solitum auctis vasa quæ cum continet constringuntur, coarctantur ita ut solitam sanguinis copiam et molem ægre, nec sine incommodo contineat, veluti vasis extremis et minutis multum constrictis, urgente febre, aut subito terrore, aut magno frigore, vel demum vasis ipsis veluti in senibus concrecentibus, eorumque nonnullis imperviis factis: vel denique ipso corpore amputato membro, mutilato, § 522. Plenitudo ad vires vocatur, talis sanguinis abundantia qualis vires moventes opprimat, ingens plenitudo hujusmodi

we can evidently diminish the fluids, and shrink the size of the living solid, by evacuation; on the contrary, we have a strong instance of repletion, in spontaneous hæmorrhages, and in those patients who are in the habit of blood-letting; in both cases, there are the appearances of a redundancy of blood, and such plenitude in the vessels, as to render a repetition of these evacuations necessary. If we were to take a labouring man from hard work, and make him lead an indolent life, in a very short time, there would arise the appearances of increased fulness in his habit, in consequence of the diminution of the secretions, and the want of his usual exercise. Nothing will produce sanguineous apoplexy sooner, than the suppression of the usual serous discharges, or the dry-

modi incommodum semper efficit et igitur ad vires dici potest. Frequenter tamen observatur istiusmodi vitium vel ab exiguo sanguinis excessu, qualem validus homo impune tulisset, si vires ægri quacunque causa multum fractæ fuerint, § 524.—Gregory's Conspectus.

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ing up of an old sore. We are likewise told, that in youth there is a greater proportion of fluids to the solids; than in old age, when the quantity of food is diminished. From a variety of circumstances we must therefore conclude, that plenitude may be induced by a retention of the secretions, as well as by full diet and much drink *.

This fulness of the vessels will seldom occur from increased serosity; because the secretions will be augmented, and the thinner parts run off again by the kidneys, as in great water drinkers; but at the same time, when the vessels are in a state of depletion, we may by an increase of serosity renew their tension; for this purpose nature makes the appetite of thirst immediately succeed great hæmorrhages, that a proper distention

* There is a calculation in Lieberkuhn's Dissertation; that if the lacteals are continually filled, and their action fully exerted, they can convey 25 lib. of chyle to the blood in the space of an hour.

may again be given to the vessels by dilution. It is advanced by an eminent professor, that the fulness of the extreme vessels, and the quantity of secretion, are in proportion to the quantity of water present in the body; diluents are therefore recommended by him, as a remedy for the contracted and spasmodic state of these extreme vessels*.

More frequently, there will arise the appearances of *superabundant* blood, from an increase of its glutinous part; occasioned by a plentiful nourishing diet, a good digestion, little exercise, or much sleep; which superabundance will shew itself, by every symptom of turgid and distended vessels, by drowsiness and languor, by a full, and sometimes oppressed, pulse and breathing; by head-ach, vertigo, palpitation, apoplexy and hæmorrhages.

* Vide Dr. Cullen's First Lines on Fever.

On the contrary, a *scantiness* of blood will originate from, vitiated and defective aliment, bad digestion, great evacuations, especially hæmorrhages; from fevers, and other diseases which exhaust and destroy nutrition; and will be attended with the symptoms of emaciated body, with debility, languor, low spirits, and faintings.

II. Diluents *stimulate* the heart and arteries, and so promote the secretions.

Their stimulant power upon the vascular system, is greatly owing to their bulk and weight. On their introduction, the first set of vessels, the lacteals, are excited to action by this means; which is afterwards communicated to the blood vessels, and heart; the same action is necessary to propel them through the body, that was at first excited by their introduction, for the more fluid that is received into the vessels, the greater will be the action required in the vital powers,

powers, to propel that fluid forward; this is discoverable in the pulse after a full meal; and I have seen a mild diluent excite a temporary fever without any effect of sweating.

They have likewise a relative stimulus, depending upon their temperature; for when the body is heated, a diaphoresis will frequently sooner be excited, by a draught of cold water, than by any other thing; which I suppose acts in a manner similar to what it does when externally applied to the body. I seldom drank cold water in the West-Indies, without immediately perspiring; and what is remarkable, the same effect was not produced, when ardent spirits were added.

On the contrary, when the body is cold, they are generally used hot, which is the practice common in this climate; the heat not only augments their fluidity, but also increases their relaxing
D powers.

powers. To ascertain this, I put cold water into a funnel with filtering paper; at the same time, an equal quantity of warm water into another, with some of the same paper; the warm water filtered through, in half the time that the cold did; and on my passing both of them, separately, through the same bladder, the warm water passed through the bladder in one fourth less time than the cold required.

It is principally by their stimulating power, that they remove torpor, and produce watchfulness; which effects have given rise to the practice of tea-drinking among nurses, and midwives, in the night time, and are not more to be ascribed to the tea plant, than to the quantity of hot water drank. For the same effects, we find Dr. Boerhaave strongly inculcating the practice of warm diluents in the melancholic disease; although he ascribed these to the diluents allaying acrimony, relaxing and stimulating

lating the vessels, and carrying off from the body, the sluggish humours.

III. Diluents produce *tenuity* of the blood; by increasing its serosity, as well as by diminishing the vital powers.

The blood has a greater degree of thickness and viscosity, in strong animals, than in weak ones; hence the blood of bulls was reckoned poisonous by the ancients, from its indigestibility in the stomach. It also varies in its consistence in the human body, at different times, and in different people; appearing before coagulation, in one case thick and dark-coloured; in another, thin, and sometimes like the washings of flesh. On being drawn out of the vessels, and suffered to stand, it in some cases discovers a large proportion of serum, and the whole mass, scarcely capable of coagulation; in other cases, a larger crassamentum, and that frequently differing in its texture. The coagulable lymph

in some cases, does not coagulate at all ; and the coagulated serum is less firm at one time than at another.

An aqueous fluid is said to combine chymically with the component parts of the blood, only in one proportion ; but a larger quantity is diffused through the serum, and coagulable lymph, and can be separated from them by filtration, which no mechanical power can do to substances chymically combined ; this is called the superfluous water of the blood, by a celebrated lecturer* ; who makes an objection to the blood's being attenuated by drink, as it readily passes off again by the kidneys, as through a filter, leaving the component parts of the blood of the same viscosity ; and is of opinion that the blood can be so altered, only by putrefaction breaking down the red particles, or inflammation attenuating the coagulable lymph.

* Dr. Geo. Fordyce.

If we are to judge from the analogy of the other secretions, we will suspect that the kidneys do not act thus mechanically; and in many situations we find it extremely difficult to promote the evacuation either from the skin, or kidneys; nor does any secretion intirely resemble our drink, which passes in a changed state; and not so readily, but that there is always a large proportion of it abounding in the blood, mixed with the serum, which preserves the blood's fluidity. There is a material difference, between increasng the tenuity of the blood, and dissolving, or breaking down its constituent parts; therefore, although I do not believe with the ancients that the blood is viscid in diseases, nor am of opinion, that drink can make its minute particles pass through vessels which otherwise would not receive them, nor that water will alter the red particles themselves; yet I believe, it will mix with the other parts, separate these particles, and lessen the cohesion of the

whole mass, in the same manner, as, when the interstices of any fluid are filled up by one still finer, the particles of that fluid acquire a greater degree of mobility *. I also think, that the proportion of the thinner part of the blood can be lessened, by drawing off the fluids suddenly, in large serous evacuations; or that it may be increased, by large quantities of liquids taken in; and for this reason, the dropfy arises from moist atmosphere, poor living, and much watery drink †.

At

* Diluentia imprimis medicamenta, aqua scilicet, et omnes potus tenues, quorum aqua longe maxima pars est, humores nostros, præter naturam spissantes, efficacissime attenuant, modo largius hausta fuerint, et per vasa lactea in sanguinem delata, § 1297.—Gregory's Conspectus Medicinæ Theoreticæ.

† Fit porro nimis tenuis sanguis, multo potu præsertim aquosæ, cibi tenui et parum nutriente, parva coctione in ventriculo, vel forsitan in pulmonibus; ipsisque organis quæ partes crassiores fingunt male se habentibus; suppressis excretionibus solitis tenuibus, sudore

At any rate I may conclude, that drink thrown quickly into the vessels, dilutes their contents; and therefore by a larger and thinner proportion of blood applied to the secretory organs in a given time, their secretions will be increased; and it will in this manner become a necessary indication in diseases.

Diluents will also render the blood thinner in another, and more permanent way,

There is always a balance preserved in a healthy body, between the solids and fluids.—An increase of nourishment will produce an increase of coagulable lymph, which will give a greater tone and density to the solids; likewise, strong vessels and a rigid fibre, will be

dore scilicet et urina, veluti frigore aut vitio organorum; vel demum et omnes fere medici putarunt, putrida universi corporis, et humorum præsertim, corruptione, § 529,—Gregory's Conspectus.

productive of more dense blood; which is the reason that strong, and old animals, have a more viscid blood, than weak, or young ones. Diluents therefore, from not having a sufficient quantity of nutritious matter in them, to repair the daily waste of the machine, will permit the force of the fibre, and vital power to decline, and the consistence of the vital fluid to be diminished.

Bleeding, by drawing off the coagulable lymph, and red particles, will evidently thin the blood in the first instance; as from an after supply of thinner fluid, the proportion of the thicker, or vital part will be diminished. Perhaps cathartics, which prove attenuant, may sometimes operate in the same way, by drawing off the coagulable lymph; but in general, cathartics require a continued use, to render the blood thinner; and then they principally act, by drawing off the contents of the alimentary canal, and of the innumerable excretories

tories that open into that cavity, and thus diminish nutrition. We should be apt to imagine that in diarrhœa and dysentery, from the great and continued evacuations, especially ferous ones, the thinner fluids would be evacuated, and the blood acquire a greater degree of tenacity; but the reverse is the case; we find more generally a tenuity or dissolution of blood, in consequence of those diseases, from want of nutrition and decline of the vital power.

Tenuity of blood upon these principles, may arise, on the one hand, from a fault of the assimilating and digestive organs, from defective aliment, an obstruction to the chyle's entering the circulation, and difficult respiration; on the other hand, from various evacuations, especially of blood; from suppressed ferous evacuations, putrescency, and too much water taken in at the mouth, or by the skin*.

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* It is almost incredible, the quantity of water that is absorbed

The effects of tenuity are, paleness, a languid and weak body, flaccid and relaxed solids, hydropic effusions, tendency to putrefaction, an imperfect action of the different functions: most probably the dropsy arising so suddenly after hæmorrhages, is occasioned by thinness of blood.

Neither tenuity, nor viscosity of the blood occurs very often, for nature is ever vigilant to preserve a consistency in it; to prevent its becoming permanently thin, by a proportionable power in the moving fibre, together with the assistance of the excretories and the common diet; to prevent its becoming thick, by occasionally suppressing the evacuations, attracting moisture from the at-

absorbed by the skin; there are authenticated histories of gallons daily discharged by urine, in diabetes, for six weeks together, more than was drank. Dr. Percival affirms that one of his hands, after chafing, imbibed an ounce and a half of water in a quarter of an hour.

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mosphere, and the use of drink from a supervening thirst.

IV. Diluents *weaken acrimony*, and lessen *putrescency* in the blood.

It is extremely difficult to prove that there is acrimony in the blood, and nature is wonderfully guarded against it, for whatever food animals use, a mild chyle is generally prepared from it; and we cannot discover it by the taste or appearance of the blood, yet, from particular circumstances, we are led to believe it does exist there. There frequently is an increased action of the secretory organs, as well as of the heart and arteries, from acrid substances taken inwardly; also, the secreted fluids are very acrid at particular times. By chymical analysis it is found, that the salt which we use in our food, passes into the blood; sal ammoniac, muriatic acid, and volatile alkali, are found, by the changes which are going on in the body,

and we frequently swallow selenites in our water; all which salts may be procured from the serum of the blood, and from the urine*. There are many other substances that must pass through the circulation; as for example, the oily particles of milk secreted from the breast, tastes of the food which the animal has eaten; purgatives which the mother has taken, communicate that property to the milk, and purge the child; also in the jaundice, the bile is absorbed and carried to the minutest parts of the circulation, and produces indolence, torpor, and sometimes fever.

* The serum chymically consists of a coagulable matter and water, in which common sal ammoniac, phosphoric ammoniac, generally common salt, frequently selenites and fixed ammoniac, are dissolved.—Dr. Fordyce's Natural History of the Human Body.

Plurima revera acria in corpus quotidie ingeruntur, &c. vel saltem plurima aqua diluta, vel glutine, oleo, phlogisto obtusa multum suæ acritudinis deponunt, et assidue e corpore tanquam noxia excernuntur, § 537.—Gregory's Conspectus.

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From our being able to detect these extraneous matters in the blood, it is equally probable, that many others may exist there. If acrimony did not exist in the blood, how can we well account for exanthemata, scurvy, lues, cancer, jaundice, or even the saltness of the urine? Perhaps also the blood is alkalescent in hot countries, and that an experience of this, taught Moses to deny the Israelites the use of blood in diet.

In PUTRID diseases, we should imagine that diluents, either by increasing the quantity of the blood, or lessening its cohesion, would be prejudicial, where it is already supposed to be thin and broke down; however, the contrary is the case; for we find by their increasing the secretions, and supplying fresh matter to the blood, they are beneficially used in the most malignant and putrid fevers; especially when their virtue is increased by a nutritious and stimulant property.

Among

Among the faculty it is still undecided, how far the blood is putrid or dissolved in diseases *. It has been a received opinion for a long time past, that the solids prepare their own fluids, and that the latter are chiefly influenced by the former; which opinion has lately been carried further, and an attempt made to expunge intirely the humoral pathology, in striking out of the list, the most remarkable of our putrid diseases, the scurvy, which was formerly supposed to have been connected with, or dependant upon a bad state of the blood. A phy-

* Dr. Fordyce, in his Natural History of the Human Body, treating of putrefaction of the blood, says "What is commonly called putrefaction, consists of two fermentations, which we shall call by the names of the first and second stage. The first and second stage of putrefaction takes place in a small part of the blood, or it is destroyed by some other operation, for after having coagulated the serum, if we squeeze out the water and evaporate it, there is left a mucilaginous matter, similar to that formed by putrefaction."—"In diseases the first stage often takes place in part of the blood; the second stage sometimes, although but seldom."

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fician of extensive practice and abilities* asserted, that he bled a great many scorbutics, where the blood appeared natural, and in many cases with size upon it. Another very judicious physician† has endeavoured to show, that those diseases which have been supposed to arise in a peculiar manner from a depravation of the vital fluid, are really owing to an original disorder of the solids; and that a deficiency of nutriment, and not any alkaline quality of the diet, produces the debility and symptoms of scurvy. A learned professor‡ has not adopted these opinions; and there is an attempt in an ingenious publication to refute them from practice§. It is not required of me, for the purpose of this treatise, to

* Vide Dr. Lind's Treatise on the Scurvy.

† Vide Dr. Milman's Treatise on the Source of the Symptoms of Scurvy.

‡ Dr. Cullen's First Lines.

§ Observations on the Scurvy by Mr. Thomas Trotter.

enter minutely into these contested opinions, but to deliver my own.

In general, blood drawn from the veins in putrid diseases, has all the appearance of tenuity, viz. a loose texture, and a great quantity of serum. Perhaps these patients before-mentioned, whose blood was fizy, had been on the recovery on shore, where they were living on broths, and vegetable diet, which would very soon change the state of the blood: for we frequently see scorbutics at sea, in the last stage of scurvy, recover in a few days after they are landed; and the most inveterate ulcers, that would yield to no other treatment, heal suddenly by an alteration in the diet and air. Or the blood drawn, might have been from those scorbutics who had topical inflammations; which always produce such appearances; for we know, that in whatever state the habit or blood of a patient may be, a little time before an inflammation supervenes, it will become

come fizy very soon after. The buffy or fizy appearance of blood drawn, is not a sign of thickness or richness; but rather shews a thinness, or at least a less tendency in it to coagulate; and arises from violent agitation and the action of the vessels upon it: by the blood's taking longer time than usual to coagulate, the red particles subside, and the pure coagulable lymph appears; which may occur in any state of the body, and we see it in the soundest health, quickly induced by an external injury.

I am of opinion that the solids and fluids, in diseases, are never separately affected, for any length of time. Although the scurvy and its symptoms shew a weakened, and diseased fibre, yet it was originally induced by a vitiated and defective chyle, which made a more imperfect blood; therefore, the solids from want of due nourishment and consequent tone, have a weakened and diseased action. It is only, by a proper
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quantity of chyle that the blood becomes nutritious, and that the vital power is maintained; hence we find Dr. Stark produced a disease similar to the scurvy by starving himself*. On the contrary, if the solids are by any means primarily weakened, or have a diseased action, the fluids will also be very soon changed, and on many occasions possess a septic tendency. It is a property of putrefaction to dissolve bodies; and this is at the same time accompanied with an escape of volatile and offensive effluvia; we are therefore led to believe, that the same process sometimes takes place in the living body; for we find the blood dissolved in fevers, and other diseases; many of which are also accompanied with a very offensive smell of the body; and these take place more readily in situations which are favourable to putre-

* There are two cases related by Dr. Milman, and communicated by Sir Geo. Baker, Bart. in the Medical Transactions where the scurvy was produced by the want of due nourishment.

faction,

faction, as in hot climates, in which there are very generally this odour, and tenuity of blood attending diseases. We likewise frequently see those patients who die of lingering diseases, or of those which are called putrid, change and turn offensive, immediately after death, as if the putrefactive process had been far advanced in them, before that period.

The living principle operates powerfully in preventing putrefaction, in the solids of the body, and also in the fluids to a great degree; but the latter at different times certainly acquire a tenuity, and what I would call a putrescent state, rather than a state of putridity. This may be induced by contagion, poisons, violent action of the vessels, absorption, or the introduction of a bad or deficient chyle, the two last primarily existing in the fluids. The scurvy certainly has its remote cause in the fluids, being produced by indigestible impoverished food; for a piece of tanned leather, contains as

much nourishment as some species of salt beef and biscuit used at sea, and diluted with a short allowance of foetid water; in which case there is, not only a deficiency of nourishment, but, from the quality of it, there arises most probably an acrimonious state of the blood; since we see such great, and sudden benefit derived, from the use of acids, increase of the secretions, fixed air, and antiseptics, that convey no nourishment to the system.

In treating of the diseases of the blood, I have not adverted to the opinion of its having life *, or properties different

* Mr. John Hunter, a surgeon of the highest rank, and ingenuity in the profession, holds the opinion, that the blood is possessed of a living principle as well as the solids, and that the life of the body is derived from the blood; that life is as much the property of every individual part of the body, as gravity is of every particle of matter, every single part being as much alive as the whole; likewise that the blood is as capable of disease as the solids are, and the blood becoming first diseased, the solids consequently suffer.

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from other inanimate matter, but have rather indulged a chymical idea of it; there will therefore be no impropriety in introducing the following observation. Putrefaction being a process of fermentation, where substances are put into such a situation that the elements of the compound are separated, and recombined in a different manner; the latter attraction must be stronger than the former, otherwise no decomposition would take place; there will therefore be no such thing as a re-fermentation, or a putrid substance returning to what it was before; and if the blood has once acquired a putridity, or been otherwise decomposed, it cannot be restored to its pristine state, but must be evacuated, and replaced by fresh matter; accordingly we find the practice is, to open the secretory vessels, and by vegetable and nourishing aliment, to supply the blood with a bland chyle; as part of which regimen, diluents are much extolled by Dr. Lind, and recommended from Cook's Narrative. For the same

reason, officers by having tea, beer, wine, and more abundance of diluents than the men that serve under them, escape the ravages of the scurvy, and every putrid disease much longer on board of ship, as well as on all other military expeditions. It was remarked, that on the Spanish main in the West-Indies last war, the officers at Fort St. Juan, who were most plentifully supplied with wine, and other liquors, resisted the general fatality longest; and Dr. Cullen has made diluents an indication for removing putrefcency in fevers.

S E C T. IV.

IN THE SECRETIONS AND LYMPHATIC
SYSTEM.

IN the last place, we shall consider the operation of diluents in other important channels, wherein their effects are more obvious than in the red vessels.

The good effects of dilution in washing out the URINARY PASSAGES, have given rise to a great many encomiums by old authors, in favour of cold water; and by some to tea-drinking in nephritic complaints.

An opinion was advanced some time ago, that from the suddenness of the evacuation of urine after drinking, and from that evacuation being continued, after the ureter of a dog was tied up,

there was another passage for liquids to the bladder, than by the course of the circulation; explained by the absorbents of the bladder anastomosing with the lymphatics of the intestines*; which opinion, though very ingenious, was not adopted.

It appears to me rather, that fluids taken in, act like a *vis a tergo* in producing a quick secretion from the kidneys, the first urine secreted not being the last liquor drank; for immediately after drinking freely of aqueous draughts, the first urine secreted, contains a great portion of mucilage, and the salts of the blood, but afterwards, with a continuation of the same dilution, it contains less and becomes milder and thinner; and by this means might be rendered quite insipid. Mechanically speaking, succeeding quantities of liquid, when urged on, will always expel the quantity that lies

* By Mr. Darwin.

before them; in this manner the kidneys are stimulated to secretion; the suddenness of which, likewise arises from an irritability of constitution, as it so often occurs in hysteria. Frequent stimulus to the discharge of urine also, depends upon habit, for in great drinkers, and some irritable people, every drop will produce an immediate irritation on the kidneys, and run off; whereas in English ladies, who from delicacy are accustomed to retain it in the bladder, the kidneys act more slowly; but in some foreign countries, and among women of less ceremony, it is quite otherwise. The quick secretion of urine then, will depend, partly on the quantity of drink taken in, partly on the irritability of the system, and of the kidneys in particular. The suddenness of the expulsion afterwards, upon the disposition of the bladder itself, and the quantity present in it.

Diluent

Diluents therefore, by increasing the flow of urine, will discharge all the superfluous salts of the blood, with the recrementitious parts of our juices; and prove serviceable in gravel, and nephritic diseases, to wash out sandy concretions from the kidneys and bladder; perhaps to alter the state of the secreted liquor, so as to make it less liable to form depositions. Likewise in many other complaints of these organs, as inflammations, fluor albus, and gonorrhœa, they will dilute the irritating salts of the urine, and wash off offending matters from the excretory ducts.

The nature of the PERSPIRATION is analogous to the urine, only differing in the smell, which it receives from the sebaceous glands of the skin; and these two secretions alternate with each other, according to the heat of the atmosphere. By these, as well as the secretions in general, a quantity of saline matters, and other substances, are ejected from a
healthy

healthy body, which are uselefs, or would be destructive if retained; and in various *diseases*, putrid, variolous, morbilious, or other extraneous and volatile substances, are carried off by the secretions; the state and facility of which, depend very much upon the quantity of liquids taken in.

The secretion of the MILK from the breast, will also be much increased by drink; not only the properties of the milk, will depend upon those of the aliment; but likewise its quantity, upon the proportion of liquids taken in; therefore nurses are ordered to use porter, and other nutritious fluids freely.

In scrophula and diseases of the LYMPHATIC SYSTEM, experience hath sufficiently established the use of diluents. Mineral waters and sea water are commonly prescribed; and independent of the benefit derived from the bracing and purging qualities of these remedies,
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they have other powers arising from their quantity.

The lymphatic vessels being deprived of the propelling impulse of the heart, and having no other principle of motion than their irritability, and contiguous pressure, to carry forward their contents*, a larger quantity of liquid applied to them, from its weight and bulk, will excite their action more powerfully; at the same time by thinning their contents, will secure a more effectual conveyance of chyle into the blood. By these means in diseases where the channels are obstructed, by any glutinous and tenacious matter, or curdy and calcareous substances (which are frequently found in the lymphatic glands), diluting liquors will resolve them; and more particularly act, in a direct manner, upon the mesenteric glands, through which all the

* The lymphatic and lacteal vessels, are of the same kind; forming a distinct system from the red vessels; and whose sole office is absorption.

chyle must pass. These glands are the most numerous of the lymphatic system, and almost always obstructed in scrophulous and rickety diseases.

It must be sufficiently evident that the more liquid that is carried through the lymphatics in general, the thinner will be their contents, the quicker their action, and the chance of removing their obstructions the greater.

C H A P. II.

THE APPLICATION OF DILUTION TO
PARTICULAR DISEASES.

TO enter into the consideration of every disease singly, where drink is used, would occupy the space of whole volumes, and perhaps include the entire train of maladies that invade the human frame; but my intention is only to convey a summary idea to the reader's mind, by making a few remarks on those diseases where they are more obviously required; in which attempt it is necessary, to be methodical, and as Dr. Cullen's Nosology is the latest and best, I shall endeavour nearly to follow his arrangement, in pointing them out.

Diluents

Diluent^s are INDICATED in every order of FEBRILE AFFECTIONS; and are more especially required, when fevers put on a continued form, or the nearer they approach to it. In all these diseases; more particularly in the ardent or inflammatory fever, they should be used very freely; but in small quantities at a time, otherwise they will be apt to over-distend the stomach, produce uneasiness, and frequently vomiting. There is always a great necessity for examining the patient's tongue to judge, not only, of the degree of fever, the state of the stomach, and nature of the disease, but also of his thirst, and the quantity of drink required. It frequently happens, that he is in a state of stupor and delirium, and not able to call for drink, which renders this attention more necessary; for these symptoms are always aggravated, and sometimes produced, by the irritation of a parched mouth and tongue; to prevent it, a repetition of cooling drink is necessary.

It is during the paroxysm of fever that drinks are most required. In the beginning of these diseases they should be of a more thin and watery nature, than in the progress or decline; at which time, they should approach nearer the consistence and nature of diet. Dr. Fothergill relates an instance of a patient, who drank twelve pounds of barley water, every day for a month, to remove a fever, by which means he fell into an incurable dropsy; which if it had been drank for a short time, or only during the violence of fever, might not have produced that effect, as we do not find the Italians particularly liable to dropsy, who use as large a quantity in fevers daily.

Dr. Lind of Edinburgh observes,—that in the REMITTENT fever, cooling acidulated liquors were of the utmost service; as they corrected the putrid humours, lessened the heat and thirst, and of course prevented the fever from arising

arising to so great a height, as it would otherwise have done; and that those are the best drinks, which are made up with some farinaceous substance, as they most readily unite with our fluids.

In the diseases of hot climates, the stomach is so irritable, and there is so much tendency to regurgitation of bile, and constant vomiting, that hardly any thing will remain upon it. While I was at Antigua about twelve years ago, there was a practice at the hospital there, of very great use in the remittent fever, to stop the vomiting and strengthen the bowels; this was by a drink composed of a log of quassia wood, put whole into a paleful of water, and left in it, which imparted a pleasant and colourless bitter to the water, and was allowed to all the sick indiscriminately to drink cold, in as large quantities as they chose. This remained upon the stomach when nei-

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which contained the smallest solid substance, could be retained there.

In the NERVOUS and PUTRID FEVER, they should throughout, be used of a more cordial and stimulating kind; and if possible containing a portion of nutriment.

Dr. Huxham says that in the nervous fever, the patient should drink frequently: though such quantities may not be necessary as in the ardent or even the putrid malignant fevers, yet they should be sufficient to carry on the work of dilution, support the sweats, and supply the blood with fresh and wholesome fluids, in place of that noxious matter, which is continually passing off: with this view also, thin chicken broth is of service, both as food and phyfic, especially towards the decline of the disease; for the same reason, thin jellies of hartshorn, fago and panada are
useful,

useful, with the addition of a little wine, and of the juice of Seville orange, or lemon.

The treatment of all the different kinds of INFLAMMATORY DISEASES, is so similar, that for the application of diluents, a discrimination of them is unnecessary.

In these diseases, and in fevers, the ancients tortured their patients with the refusal of drink, during the first stages; from a supposition that such treatment would weaken the patient, and reduce the strength of the disease; and from a persuasion, that after abstinence, the application of diluents would have a fuller effect in procuring sleep and perspiration. Some of them were afraid that drink would weaken the remedies they made use of to subdue the disease, of which the thirst was only a symptom. However later experience inclines us to believe, that diluents will not weaken,

but rather assist the operation of other remedies; and that we had better attempt to allay irritation, and subdue inordinate action in the system, than to weaken the strength of the body; for these purposes, dilution becomes a very material part of the *antiphlogistic regimen*.

In ERUPTIVE FEVERS, they are useful in the beginning, to abate febrile commotion; in the progress, to mature and fill the eruption; as well as in the decline, to obviate putrescency, and carry off contagious matters from the habit; we therefore find it in this country, a very common practice to supply the patient freely with milk pottage, to help to fill the eruption of the small pox. Baron Dimisdale recommends patients to drink cold water after inoculation, till the eruption is completed; and says, when he has persuaded his patients to rise from their bed and go abroad (though sometimes led by assistants), and has allowed

lowed them to drink as much cold water as they chose, they have not suffered the least unfavourable accident ; on the contrary, they had every favourable symptom ; but frequently at the beginning of the disease, there was a rash or efflorescence upon the skin, that accompanied the variolous eruption ; in that case, the patient was ordered to refrain from cold water, or any other thing cold.

In HÆMORRHAGES a draught of cold water is frequently taken to restrain them. Hoffman and other physicians recommend cold drink in menorrhagia. It is more requisite when the body is much heated, as in uterine hæmorrhages attending labour, where it has a similar effect to cold externally applied : in these cases the hæmorrhages are so sudden and violent, that a glassful of cold water drank, will produce as immediate an effect, and will be of as much service as any internal medicine

whatever. It will also operate in giving distension to the vessels again, which after the cessation of the hæmorrhage may in some cases be necessary; but with this view, diluents require a cautious use, for hæmorrhages are frequently renewed by their continuation.

In FLUXES and SEROUS DISCHARGES they are used, not only to supply the waste of fluids; but also to wash off any irritating substance, that may exist in the liquor secreted, or arise from its retention.

In the CATARRH it is observed by Dr. Cullen, that when moderate, it is commonly sufficient for a cure, to avoid cold, or to abstain from animal food for some days; or perhaps for the same time, to lie a-bed, and take often, some mild and diluent drink a little warmed, to promote a gentle sweat; and after this, to take care to return very gradually to the use of the free air.

In

In DYSENTERY the thirst and fever will demand diluents; which likewise will thin acrimonious matters in the intestines; but they should be of a mucilaginous kind, and given cold, as the bowels are so irritable, and the peristaltic motion so much increased, that frequently the mildest diluent, especially when warm, will excite pain and evacuation.

They are seldom recommended in NERVOUS diseases, from their tendency to diminish the vital power; unless when they are very stimulant and nutritious, such as the use of wine.

IN the HYPOCHONDRIAC disease; in all cases of bad digestion; and in weak and delicate stomachs; much liquid is not to be used, for the quantity is prejudicial as well as the quality. A large quantity increases the weakness of the stomach, by over-distending it, and hurrying away its contents. Respecting the quality, tea and coffee, from being seda-

tive drinks, should be used with great caution. Also the less, that the stomach is accustomed to stimulus, from the strength of the drink, the better; therefore fermented and vinous liquors, as containing a proportionate quantity of spirit, are to be used with moderation; but if their flatulency and acidity be not troublesome, the quantity of spirit they contain, being proportionably small, and enveloped in a mucilage, renders them less detrimental to the constitution, than the use of ardent spirits, however much diluted; for this last, by a constant use, weakens the stomach; and generally, in cases of bad digestion, the patient by receiving a temporary relief from them, is betrayed into the renewal of their use, till a habit is acquired, and the disease much strengthened. Acescent liquors, and those which run readily into the acetous fermentation, as well as fermenting and flatulent drinks, generally disagree with weak stomachs, and aggravate these diseases. There are some cases, in which a little brandy, or other spirit, may be added

added to water for drink; but when water itself can be brought into use, we should esteem it as a valuable gift; for as a constant drink, it is best calculated to preserve an equal flow of animal spirits, and the due performance of digestion, on which depend, our health, comfort, and longevity.

In ASTHMA, and difficult breathing, a thin cool diet, and water, or cool watery liquors, are the only safe and proper drinks; fermented and flatulent liquors are hurtful, or any warm and tepid drink, such as tea and coffee, will increase the asthma, as well as weaken the stomach.

HYDROPHOBIA and CANINE MADNESS by Boerhaave, and other physicians, have been thought to arise from the want of water, excess of heat, and much animal food. The dread of water, which is the principal distinguishing symptom of canine madness, is said to be peculiar to the human race; and
that

that some patients by resolution have conquered the dread, but never the convulsive struggles, that follow the contact of fluids; which most probably arise from excessive thirst, with a peculiar sensibility of the nerves, exciting spasmodic affections of the throat, &c. with so much violence, as to resist the patient's effort to swallow. Drinking sea water, and a sweating course with diluents, have been equally unsuccessful with all the other modes of treatment; and nothing yet tried, can with certainty be said, either to prevent, or cure the disease, unless it be excision, or destroying the wound where the poison was received.

Diluents are prescribed in some of the diseases arising from DEPRAVED HABIT.

When CORPULENCY becomes a disease, a thin, watery, and spare diet, will be the means of reducing the body. The

The use of salted meats and drinking freely of coffee, are likewise recommended for this purpose. Dr. Fothergill says, that a strict adherence to vegetable diet, is more effectual than any other means.

The famous Dr. Cheyne, who had excessive bad health when a young man, grew to such an enormous size, as to weigh thirty-two stone, and was obliged to have the whole side of his chariot made open to receive him; but by a milk and vegetable diet, he reduced himself a third, afterwards enjoyed good health, and died at seventy-seven years of age. A similar case is related by Sir George Baker, Bart. in the Medical Transactions, of Mr. Wood, who reduced himself ten stone weight, by farinaceous diet, with pure water for drink; and from a peculiarity of his constitution, a small quantity of drink agreed best with him; but if the object is to reduce the

the body, much watery liquid is attended most certainly with that effect.

In the SCROPHULA, or King's evil, mineral waters are much drank, and sea water is used internally as well as externally; their efficacy requires hardly any other proof, than an attention to the great resort of company to watering-places; for at no former time were these places in such great estimation as at present in this country.

The MINERAL WATERS have certainly acquired great medical reputation, from their containing various active substances. They are stimulant and antiseptic, from their aerial acid; they alter the habit and state of the blood, by their hepatic air; they promote the evacuations, by their saline contents; and they strengthen the body, by the tonic and astringent virtues of their metallic impregnations; but then these substances are in such a diluted state, that the waters
must

must be as useful from their bulk, as from any specific virtue contained in them; because we cannot obtain the same good effects, from a much larger dose of the medicating or metallic part by itself. And notwithstanding the prejudices of mankind in favour of natural productions, yet the native mineral waters are of no more use in medicine, than the same substances dissolved in a large quantity of common water; for artificial mineral waters are of equal importance, or perhaps superior, to those found in the earth, by their not being made to contain gypsum, or earthy substances, which are at least useless, and may be hurtful to the stomach.

Dr. Cullen, in treating of Scrophula, says, “ With regard to the choice of
“ mineral waters most fit for the pur-
“ pose, I cannot with any confidence
“ give an opinion. Almost all kinds of
“ mineral waters, whether chalybeate,
“ sulphureous, or saline, have been em-
“ ployed

“ ployed for the cure of scrophula, and
“ seemingly with equal success and re-
“ putation; a circumstance which leads
“ me to think, that if they are ever suc-
“ cessful, it is the elementary water,
“ that is the chief part of the remedy.”

The operation of the *simple watery menstruum*, has been already shewn to be very powerful, on every part of the system; and likewise very salutary, when used with propriety and moderation; to this we will impute the greatest virtue of mineral waters, for the stimulating power of the impregnation that they contain, is diminished by dilution, and rendered less effective upon the living fibre, since a dose of any poisonous drug, will proportionably lose the deleterious quality it possessed, by much dilution; the general principle, therefore, which renders mineral waters efficacious, is their quantity of liquid, uniformly, and constantly pervading every part of the system, producing
flow

flow and gradual changes ; and when a medical virtue is superadded to the effects of a large quantity of common water constantly applied (such as the contents of the Cheltenham waters, which gently evacuate excrementitious matters, at the same time create an appetite), their virtue in altering the habit of body must be very great*.

The SEA WATER is also in great estimation for scrophula, as well as for cutaneous diseases ; the good effects are not so much from the stimulus, and evacuation it produces, (which is common to other remedies) as from its attenuating quality ; for this reason many peo-

* Dr. Percival, in his Essay on Water, says, " I have reason to imagine, that the common swellings of the lymphatic glands, owe their diseased state to the water which the patient drinks. In these cases, as well as in many chronic pains of the stomach and bowels, a course of distilled water might be as beneficial as the most celebrated mineral waters are in many other disorders, and might prove no inconsiderable addition to the materia medica,"

ple.

ple mix a large proportion of fresh water with it, to render its effects more beneficial.

It is more heating and stimulating, than any other waters; therefore is used as a discutient externally for indolent tumors, and is less proper for inflammatory habits.

The best regulation for the use of it, will be, to procure it as far from the shore as possible, within an hour of high water, and at a distance from the mouth of any river; then it should be mixed with an equal quantity of fresh water, which will prevent its producing so much thirst, render it more palatable, and keep it within the bounds of a moderate evacuation. When the patient cannot go to the sea, we can make it artificially, by mixing half an ounce of common, with six drachms of Epsom, salt, and dissolving them in a pint and a half of common water.

In

In the VENEREAL DISEASE, the use of mercury will be rendered much safer, and be much assisted, by the free use of dilution: decoctions of guaiacum, tend, not only to circulate the mercury through the system, and open the excretories; but perhaps also, it has a specific virtue in the cure of the disease. The diet of the Lock Hospital is dilution, for the patients are allowed only, water gruel and bread, for the first two or three weeks that they are under the cure of any venereal complaint.

In the JAUNDICE, and bilious diseases, they will open the excretories for the evacuation of bile; and as all the secretions are increased, and rendered more fluid by dilution, the flow of hepatic bile will be more free, and regular, into the intestines; therefore the blood will be less impregnated by it; likewise, stones and obstructions removed from the channels of the biliary evacuation, by the use of liquids.

In LOCAL DISEASES, diluents act not only, as a general alterant of the system, and thus ultimately produce their effect on a particular part, but are also often used, with an intention of acting immediately on the part affected; as in the *gonorrhœa*, where they become a material part of the cure, by preventing the irritation of the urine, and promoting a free discharge of mucus. Also, in most *diseases* of the *bladder* they are useful, as acting quickly on the urinary passage; perhaps the many supposed *solvents* have no other virtue, than as mucilaginous diluents. It is upon the diluting principle, that the Malvern waters have been so celebrated, as powerfully *solvent* of the *human calculus*; Dr. Percival proposes distilled water, as a substitute to produce the same effect. I have seen them of service in *suppression* and *obstructions* of *urine*, contrary to the received opinion, that they always aggravate these diseases*. In *uterine obstructions*,

* This observation is applicable, particularly to spasmodic

structions, or *suppression* of the *usual discharges*, on many occasions, they may be managed, so as to be rendered serviceable in promoting them. And plentiful dilution is the principal remedy against the *strangury*, or effects of *cantharides* upon the urinary organs.

Diluents are of great service in resolving indolent *tumours*, and *schirrosities*. The use of the *sarsaparilla* decoction with *mezeoreon*, has often been attended with success in *schirrous tumours*; particularly, when conjoined with small doses of *antimony*, or *mercury*. The late M. Pouteau, doctor of medicine, and chief surgeon to the Hotel Dieu at Lyons (whose posthumous works have been published under the patronage of

modic suppressions, and when joined with the use of the warm bath; because, when obstructions arise, from a diseased structure of the passages leading from the bladder, diluents may aggravate the disease; for frequently, by the bladder receiving a larger quantity of urine, it will endeavour to expel it faster, and more forcibly, than the passages are capable of admitting.

the Royal Society at Paris), recommended the drinking of frozen, or cold water, as a cure for schirrous and cancerous tumours, without allowing any other aliment or medicine for several weeks; and relates a case of Madame Girard obtaining a cure of a schirrous womb, particularly by this means, after all other resources had failed *. He advises the extirpation of any external cancer, although it should be attended with a cancerous disposition of the internal viscera, from being of opinion, that the internal malady will give way to this treatment †.

In

* “Ces accidens ne cederent qu'à un usage abondant d'eau froide, tant en boisson qu'en lavemens”—
“qu'il se fit chez Mde. Girard par le moyen de l'eau à la glace, un vrai travail, critique, & que la crise fut déterminée du côté des felles.”

† L'operation faite, la maladie sera mise à l'eau à la glace ou à l'eau bien froide pour tout remede, & pour toute nourriture, & la quantité de la boisson sera graduellement augmentée suivant la facilité qu'elle trouvera à passer par les urines.—Œuvres posthumes de M. Pouteau, tome premier.

Mr

IN CUTANEOUS DISEASES, decoctions of farfaparilla, &c. are prescribed, under the common appellation of sweeteners of the blood. The farfa root taken in substance, is a very inert medicine; notwithstanding the small quantity that the decoction contains of it, yet very great benefit is often derived in practice, from its use, which must principally arise from its being a mucilaginous diluent. I believe, that many more of these decoctions have few other virtues than as diluents, otherwise, why do we use them in such large quantities, when a much smaller portion of fluid would be more grateful, and might be as much impregnated with the virtues of the drug?

The Indians are famous for cures per-

Mr. Pearson, surgeon to the Lock Hospital, informed me, that he had lately a case of schirrous uterus, and tried the watery diet as proposed by Pouteau; where he allowed the patient only water, tea and bread; by which means she recovered in the space of two months.

formed by decoctions of fundry herbs ; the greatest virtue of them, is to be ascribed to dilution, assisted by impression on the imagination ; or they may have gained the credit of a cure, in a manner similar to the reputation acquired by many other inert medicines, viz. from diseases wearing themselves out, during their use ; or perhaps they were the last remedies in use when the patient recovered.

Diluents are CONTRA-INDICATED in all debilitated habits, and where there is a lax fibre ; or when from low or bad living, the blood is thin and poor ; or when the action of the heart is very weak, they will in such cases assist in producing hydropic effusions ; they should therefore be cautiously used, in nervous diseases, hæmorrhages and dropies ; when they are used in either of the two first diseases, they will be much safer cold than warm.

They

They are rendered more or less detrimental in particular situations.

A greater quantity of liquids may be used in hot, than in cold weather, as they pass off again by the perspiration, as well as by the urine; it is for this reason, that they are in such frequent use abroad, and prescribed so freely in warm climates.

People who use a great deal of exercise, or have a strong muscular fibre, will be enabled to drink much larger quantities of liquids, with less risk of dropfy, than those who are indolent, or have a weak fibre, and diminished energy of the heart. I think that the inhabitants of London in general, are more liable to diseases from lax solids, than those of any other country (marshy situations excepted), and can with less safety bear the evacuation of bleeding; consequently, if this observation is just, the continued use of much dilution, should

not be practised by them, unless when it becomes necessary for the removal of some disease.

There are some cases, wherein we have emptied the vessels by evacuation, where a free use of diluents might fill them again, and prevent the evacuation proving so useful as it would otherwise be. There are other cases, where we want to take a diagnosis from the urine, in which quantities of liquids drank, will disturb it, and prevent our obtaining the necessary information; but these are rare, and at least but secondary considerations.

I shall make some observations on two diseases, wherein diluents have been thought prejudicial.

In DROPSY, till lately in this country, they have been universally condemned; and cases are related of cures performed by total abstinence from
drink;

drink; but it is so little in our power to resist the appetite of thirst in any extreme, that these cases of abstinence are much rarer than supposed. On the contrary, their use is now recommended, as being necessary for the operation of diuretics, and cure of the disease; the propriety of the practice has been not only ably supported, but cases are related of its success*.

* Several foreign physicians have used drink, to assist their remedies in the cure of dropy for a length of time. The reputation of Bacher for the cure of the disease was so great, that the French King paid a large sum of money for his secret; the basis of which was black hellebore, with dilution. Sir George Baker, Bart. has published some cases in the London Medical Transactions, where the patients were recovered from the most dangerous state, by a quantity of diluting drink. Dr. Milman, who has managed this subject in a masterly manner, draws the conclusion, "that to irritate the body by medicines, and to prohibit drink at the same time, is not less repugnant to the laws of Hippocrates, than prejudicial to the patient; and that those medicines are fruitless without drink, which with its assistance often succeed very happily." Dr. Home of Edinburgh, has likewise published twenty experiments, which confirm the same opinion.

If

If a derivation of fluids can be procured from the cavities, by forcing the kidneys with diuretics, and diluents, their use may be continued, to support the evacuation. The safest rule for that purpose will be, to adjust the proportion between the quantity of urine evacuated, and drink taken in; and when the secretions in general, balance the quantity of drink, we certainly are safe in its use.

I think that they may also be rendered serviceable in DIABETES, which is a disease analogous to dropfy, in the little power we have at times over the state of the skin, and kidneys. It is a law in the constitution, when a great evacuation of any fluid takes place in the body, all the other fluids are determined to that place. As in this disease, there is a determination from the rest of the system, to the kidneys, and the skin is in an absorbing state; if we can produce a determination from the kidneys,

to the skin, by diluents, co-operating with the ordinary remedies, diaphoretics, warm bathing, flannel, and friction, we shall be likely to produce a cure: perhaps also, diluents may assist the assimilation of the aliment, and remove the sense of the heat, felt at the stomach in diabetes. The most favourite remedies countenance these opinions, for alum whey, and lime water, must have other effects, than merely their astringency on the kidneys. I am informed by a physician of extensive practice in this metropolis, that diluents are of more service in this disease, than any other remedy; for that reason, he directs his patients in these cases, to use the Bristol waters.

At the same time, by an injudicious use, diluents may be made to aggravate any disease, particularly the dropy and diabetes; which can be no objection to their moderate and well-timed application (otherwise we might reject
aliments

aliments because some are gluttons), but should only make us the more attentive, to the nature of their operation, the disease, and the constitution of the patient.

C H A P. III.

THE DIFFERENT KINDS AND QUANTITIES OF DILUENTS.

VARIOUS kinds of diluents have been used in the healing art, from its earliest period, to the present day, but not any one held in such general esteem, as *barley water*, which ever since the time of Hippocrates, has been a standard drink in acute diseases.

From the writings of the ANCIENTS, we can obtain little satisfactory information respecting dilution, owing to the idea they entertained of its operation; but however erroneous their reasoning may be, their facts demand our attention: from their having been accurate observers

observers of nature, their authority has been held sacred, during the great progress of medical science in succeeding ages.

HIPPOCRATES may very well be called the founder of physic, for before his time, it was little else, than a heap of absurd superstitions, when heroes and priests were physicians. But from his paying so much attention, to the minute symptoms of diseases, and every accident attending their access, progress, and decline, joined with an extensive practice, he was enabled to make a complete history of them; and by comparison in a variety of cases, to form such exact prognostics, and judgment of events, as by many to be esteemed a prophet.

The books ascribed to this great man, are numerous, among which, there are several written on diet and drink; subjects which attracted his attention more than all others, from his reckoning alterations

terations in the diet and air, to be the most prevalent causes of diseases; this made him exceedingly cautious in the choice of these, and his practice to turn almost wholly on that opinion; it was so much his wish to be reckoned the author of dietetics, that he said, the ancients had wrote almost nothing concerning the diet of the sick, although it was one of the most essential parts of the art. He took a good deal of pains to distinguish between good and bad waters; and said, that the best were clear, light, without smell, and taken from fountains that face the east.

In acute diseases, he preferred liquid diet to solid; and this was generally a broth made of prepared barley, similar to our barley water, which he called PTISAN; a name, which was common at that time, to both the grain and the liquid made from it. There were a great many different kinds of ptisans, such as of lentils, rice, wheat, millet, maize, &c.
but

but the ptisan of barley, was called simply *ptisan*, because of its preference, and the great esteem it was held in: to this he used to add occasionally, a little vinegar, leeks, or aniseed, especially for women after lying-in, to obviate diseases of the bowels. The ptisan was used in preference to any other thing in fevers, because he said, it moistened, and softened very much, was easy of digestion, produced no thirst, washed away what was unnecessary, and kept the body gently open; the barley having swelled as much as possible in boiling, it would not produce distension of the abdomen, whilst its slipperiness prevented its adhesion; this he ordered to be used twice a day for diet, especially to those patients who were accustomed to two meals in health, and only once a day, to those who were used to one only; he lessened the quantity of barley as the fever grew more violent, till there was very little farina in it; and said, that in pleurisy, if it was not very much diluted, the

the fate of the patient would be hastened by it. He not only used a thin moistening diet, but also thin drinks, in diseases, such as the cream of the ptisan, sometimes water, but more frequently used, eight parts of water to one of honey, with a little sweet wine (which was called aqua mulsa), and sometimes added a little vinegar to it. He frequently allowed wine in fevers, especially the white wines, which he said, were best for promoting a flow of urine, and should be mixed with an equal quantity of water; for the wine would expel what was hurtful to the body, and the water serve to temper the acrimony of the humours; but if a violent head-ach or delirium supervened, wine should be laid aside, and water substituted in its room, or at most, a watery sort of white wine, observing to give some water after it*. In chronic diseases, milk and wine, were his favourite remedies.

ASCLE-

* " In febre biliosa quæ hominem quotidie corripit, et

ASCLEPIADES was the leader of a sect, in opposition to the doctrines of Hippocrates; and said, that Hippocrates and his followers, by depending on nature, attended their patients rather to observe in what manner they died, than to cure them.

He acquired great fame for the cure of diseases, by cold water and wine; but never spared his patients any kind of torture; striving to diminish their strength, by watching and thirst, not allowing them even to cool their mouth, with a drop of liquid, for some time after the appearance of the disease; but when the violence of the fever was abated, he allowed them to drink, and to have their beds made soft, then ordered wine, or other aliment, but this

os amarum jungitur, et vomitio juncta, et ad lumbos, cruraque gravitas, ea die qua febris detinet, quantum quis bibere volet, aquam frigidam sumere oportet.—Hippocrates, lib. ii, de Morb. § 36.

was

was frequently not before the seventh day.

CELSUS is justly called the Roman Hippocrates, for he supported, and elucidated his doctrines, in opposition to the innovators of these times; yet he shewed a great inferiority of skill, by differing from him in the use of drink in fevers.

He was of opinion, that in the beginning of diseases, patients should be made to endure hunger, and thirst, but afterwards to be nourished with good aliments, and said, that in fevers, the attention should not be directed to the symptom, thirst, but to the disease which produced it, and after that was subdued, the thirst would naturally cease; therefore, the patient should be prohibited the use of drink, during the whole fever*,
at

* De potione, vero ingens pugna est, eoque magis, quo major febris est, hæc enim sitim accendit, et tum

at least, to be allowed it in a very small quantity, that the efficacy of the remedies used against the disease, might not be diminished by dilution. He was not so rigid in the refusal of drink, as some of his cotemporaries, but when he indulged in its use, it was not to be on the first day, unless the pulse became moderate, and food could be taken at the same time; he chose rather to cheat the thirst, by liquids applied to the mouth, than by the use of drink.—He speaks in favour of cold liquids, and advises a great quantity of cold water to be given, even, in the greatest increase of an ardent fever, to abate it, and to be vomited again*; but gives cautions against the use

maxime aquam exigit, cum illa periculosissima est, sed docendus est æger, ubi febris conquieverit, protinus sitim quoque quieturam; longioremque accessionem fore, si quod ei datum, fuerit alimentum; ita celerius eum desinere sitire, qui non bibit.—Cels. lib. iii. cap. 6.

* “In summo incremento morbus est, utique non ante diem quartam, magna siti accedente, frigida aqua

use of it, when the patient is sweating from hard labour; or, when he is travelling; he follows Hippocrates in the use of the ptisan in acute diseases.

GALEN was so much a follower of the doctrines of Hippocrates, that he declares, none of his commentators understood his meaning, besides himself.—Galen added a great deal of false reasoning, to the practice of Hippocrates.

He denied patients drink in the first days of fevers, and speaks in favour of

copiose præstanda est, et ad satietatem danda, qua pro medicamento utentur. Ubi factum est, multa veste operiendus est, et collocandus, ut dormiat: fereque post longam sitim et vigiliam, post multam satietatem, post infractum calorem, plenus somnus venit, per aquam ingens sudor effunditur, idque præsentissimum auxilium est”—
“ut bibat etiam ultra satietur; et cum jam venter et præcordia, ultra modum repleta, satisque refrigerata sunt, vomere debet: quidam ne vomitum quidem exigunt, sed ipsa aqua frigida, tantum ad satietatem data, pro medicamento utuntur.”—Cels. lib. iii. cap. 7.

cold water* ; says, that he had frequently seen patients immediately freed from an ardent fever, by drinking cold liquids, but that this happened when the humours were moderately concocted, and therefore, at a time when the violence of fever was abating. He has written a book on the barley ptisan, in the same language, as that of Hippocrates †.

* In febribus potionem frigidam impense laudat ;
 “ quia extinguit febrem, et naturam robustam reddit,
 ut deinceps per alvum et sudorem expellat, quæ noxia
 sunt.”—Galenus, Meth. Med. lib. ix. cap. 5.

† Dummodo eo usus sit, facile infernis elabatur, neque adstringit, aut moleste vellicat ; nec dum in ventre est, in tumorem elevatur ; quod vero ptisana nil contineat glutinosi, aut obstructioni aptum (veluti universa cetera quæ lenta sunt) perspicuum est detergat namque non for-
 dem corporis solum, sed et exhibita pituitosum quemque in ventre humorem expurgat, ceterum flaccida moderate existit, id est madida, ac sitim abigens—ergo cum sic se habeat, acutis febribus ad modum conveniens fuerit, nec ea tantum gratia, quod his indequaque repugnet ; sed quod e maxime concoctilibus sit, ac in nulla non qualitate imbecillima, digestuque facilis, atque ob deterisivam vim, putridos succos lustret, semiputres autem concoquat.—Cl. Galen, de Ptisan, liber.

VAN

VAN HELMONT, who boasted of curing all fevers in a few days, said, that in these cases, he abhorred the idea of abstinence from drink, that it deprived the patients of strength and nourishment; and that they should have liberty to drink when they pleased, without the leave of their physicians; who, had frequently been disgraced, by the recovery of their patients, from breaking through their rules of abstinence.

From the BOERHAAVIAN DOCTRINE, there arose a great reform in favour of the practice of diluents. Boerhaave opposed the ancients in the use of them cold, and recommended them to be administered, neither very cold, nor very warm, but nearly about the heat of the human body; for when they were in the extremes of heat or cold, they were attended with the same effect, of coagulating the blood.

He says, that the symptom of thirst ought always to be immediately relieved, more especially in acute diseases; and affirms, that nothing is so great a diluter of thick blood, as warm water taken in large quantities; when thirst was accompanied with great weakness, wine and spirits might be added to the drink.—In acute diseases, he was partial to rice gruel, and barley water acidulated with fruits, as citrons, oranges, &c.

HOFFMAN's SYSTEM was also favourable to dilution*; and he says, that

* Post sanguinis missionem, omni studio eo annitendum, ut igneus iste totius corporis æstus cum immodica siti et faucium ariditate, removeatur iis, quæ æstuosam illam partium sulphurearum agitatione figunt et temperant, ac preterea fibrarum rigidum spasmus laxant, et humores in vasculis minimis stagnantes diluunt, fluxiles reddunt et obstructa referant, ut æquabilis et liberior fiat per loca convenientia et vasa transitus, nec immerito tam magnifice de frigida potu in ardentibus sensisse veteres, uberius testatur et ratio et experientia; nisi enim ventriculus, vel aliæ internæ partes jam vera inflam-

that fluids are necessary, not only, from the structure of the body, and the nature of the blood, but also, that the most violent diseases have been cured by the use of water. He recommends diluents impregnated with acids and nitre, as the principal remedies in fevers, especially after bleeding; and says, if they were taken in sufficient quantity, they would

inflammatione affectæ, nec summa cum externorum frigore anxietas, neque etiam pulsuum contractio et sanguis deficiens adsit, utique aqua bonæ notæ subfrigida, non prorsus gelida, haustu non simul et semel, largiter tamen pota egregie prodest. Neque etiam a frigore noxa timenda, quia frigidum, successivis haustibus, corpus subiens a calore interno tepescit, qui humidus tepor ad relaxandas spasmo contractas fibras et succos in minimis stagnantes expediendos et fluxiles reddendos apprime proficius, et hinc sudor et urina copiose fluant et alvus moveatur; sed quum in septentrionalibus nostris regionibus admodum raræ leves ejusmodi, puræ et subtiles aquæ reperiantur coctione et admixione congruorum corrigendæ utique, ipse Hippocrates aquam cum hordea coctam, jam in ardentibus laudat, et Aretæus aquam cum lacte mixtam in cholera commendat.— Hoffman, tom. ii. de frigido potu in febre ardente.

abate

abate heat, and thirst, raise a sweat, and procure sleep.

All over the *Continent of Europe*, dilution is a very fashionable practice; but the SPANISH and ITALIAN physicians carry it farther, than those of any other country.

Their DIÆTA AQUEA consists, in avoiding every kind of diet or drink, but simple water, which after diseases have continued a week or longer, is to be administered to the amount of eight or ten pounds, for several days successively, in small quantities at a time; this they frequently prescribe to be taken warm, but more generally cold, and in hot weather, sometimes to be cooled with ice.

The different kinds of medical diluents, now used in THIS COUNTRY, admit of much variety: and the greater choice there is of them, the better, for by that means, there is a greater opportunity of pleasing the patient's taste; we have it also more in our power to hit upon one, that will agree with the stomach: it is evident that some constitutions will reject drinks that are salutary to others, independent of the disgust, that is ever ready to be formed in the mind of the patient against particular things, and at no time more than in the valetudinary state.

The most common drinks in acute diseases, are, watery *infusions of the English herbs*, making different kinds of teas; amongst which, we generally find one
that

that is grateful to the patient, some preferring sage, others mint or balm; all which are nearly similar in their virtue; the herbs impart an aromatic, and gently stimulating property to the water; and these teas will stay on the stomach when it rejects many other things. There are various other watery infusions, under the name of teas, which are impregnations of active drugs, such as ginger tea, horse radish tea, &c.* The different kinds of these, it is totally unnecessary to enumerate, and the use of them varies in every different county.

The farinaceous seeds of the grasses, are mucilaginous, and easy of digestion, when the organs of the body are weak. For this reason *barley water* is very much used, although it is not made of such thick consistence, nor the barley eaten

* The horse radish may be infused, to about half an ounce or more, in a pint of water, and drank every day, as an exceeding good remedy for amenorrhœa or dropfy.

as food, in the manner of the ancients. The water, in which the barley is boiled, contains its finest flower, and is used as a mild cooling and laxative drink; without stimulating, it has a sufficiency of nutriment to support the powers of life; frequently, a little lemon juice is added, to render it, in particular cases, more useful and palatable.

Water gruel is a drink similar to barley water*; but as oatmeal is more nutritious than barley, it is less fit for inflammatory diseases, although the difference is so very small, that patients need hardly be refused the choice of either, when the gruel is made thin.

Rice gruel is similar to the two last,

* To prepare gruel, the Scots oatmeal is preferable to what is made in this country: from its constituting a great part of the diet of the poor in Scotland, more pains are taken in preparing it; it is generally better dried, and the husks not ground down in it.

but

but rather more astringent; and therefore, more adapted to particular cases.

When the stomach is very irritable, a drink made with *cold water and toasted, or burnt bread*, will remain best upon it; and very frequently will check vomiting. Toast and water is a drink, that is, not only very useful, but very much longed for, by patients in febrile diseases.

When a cordial and diaphoretic is to be used, *wine whey* is very suitable; and may be made of any strength proportioned to the occasion *.

When more nourishment is wanted,

* Wine whey is generally made with about two gills of wine, added to two pints of milk and one of water boiling, and then sweetened; but the best method is to boil half a pint of milk, then add a gill of wine, separate the curd, and lower the whey with water according to the state of the patient, and afterwards sweeten it with sugar.

beef

beef tea, and thin broths are very useful, in the form of drink; they require little digestion, and are in many cases more pleasant, and convenient to the patient, than thicker diet.

Acidulated drinks, such as lemonade and orangeat, are very useful in inflammatory and putrid diseases*. The acids are a very great addition to the virtue of drink, as they quench thirst, and greatly promote urine and perspiration. Frequently, the addition of wine to acidulated liquors, such as the West Indians call *sangree*, renders them better adapted to putrid diseases. I have frequently given patients *cyder* to drink freely, in putrid fevers, and however it might at other times have disagreed with

* Lemonade is made by mixing a small piece of the outer rind, and the juice of one lemon, with a pint and a half of boiling water, then adding about two ounces of sugar.—Orangeat is made in the same manner, only using the juice of two oranges instead of the juice of a lemon.

their bowels, I never found it hurtful in these situations.

Imperial drink has been a long time in use, and is deservedly esteemed a pleasant, cooling, laxative and antiseptic drink *.

Apple tea † or currant jelly mixed with water, make very convenient, and useful drinks; especially for children.

Drink made with *cream of tartar*, has

* Imperial drink may be made with, two or three drachms of cream of tartar (or in its stead half a lemon), a small bit of lemon peel, an ounce of honey or sugar, and a quart of boiling water, mixed together and strained.

† Apple tea is made, by pouring boiling water on slices of four apples, and afterwards sweetening it with sugar. For convenience, this may be drank from the spout of a small tea pot; which practice is useful for children, because in this manner you can give them what you please, without their being able to discover it, by sight or smell.

been

been much extolled by Dr. Lind for diseases of warm climates; on his authority, I have repeatedly used it in about an ounce, to a quart of water, and found it very serviceable as a laxative, diuretic and antiseptic, and for removing bilious obstructions. It is used by many in this country for common drink in the summer, to lessen heat and fever.

In cold weather, when there is not a nurse, nor fire in a sick room, the drink may be put hot into a bottle, and taken into the bed, and kept under the clothes, which will prevent it from growing cold, and render it convenient for use.

The QUANTITY of diluents necessary in different cases, will be greatly regulated by the degree of thirst, the symptoms, and nature of the disease. In fevers and inflammations, where they are principally indicated, there is no occasion for any other limitation, than to avoid giving them in such quantities as, to

I over-

over-distend the stomach, or produce vomiting, or purging unnecessarily; and to be careful not to protract their use too long, or after the violence of fever is removed.

To assist the operation of an EMETIC, much smaller quantities of drink are now given, than formerly; I seldom for this purpose, order more than a quart or three pints of thin gruel, or warm water to be drank; as I observe when large draughts are taken, the stimulus of their bulk, forces them to be rejected, without having time to combine with the contents of the stomach; the patient in such a case will vomit for hours together large portions of clear drink, while bile, and other morbid contents are left behind, which would have been thrown up, if a nausea had been suffered to bring the stomach into action, without much drink. By administering such moderate quantities, we shall also avoid the debility and danger, that arise from over-distending

distending the stomach, as will be elucidated by the relation of a late unfortunate case.

Mr. Pettigrew, an officer of the tenth regiment, at Fort Augusta near Kingston in Jamaica, was naturally healthy and temperate ; but having indulged in wine very freely, on the evening of last St. Andrew's day ; he next morning about ten o'clock, took very large quantities of warm water to make him vomit ; some gallons it was thought before the operation took place ; but at length returning with a violent exertion, he said, he felt something give way within him ; and he died in the night of the same day. Mr. Dryden, hospital mate, and several more of the faculty, who attended at the dissection, found the œsophagus, and part of the stomach ruptured, and the liquor escaped into the thorax.

At the same time, it is necessary for the operation of a vomit, to drink a cer-

tain quantity, to prevent the too violent straining, and exertion of that organ; chamomile tea drank warm, and returned again immediately, can have very little effect as a bitter; I therefore generally give the emetic sufficiently strong, to operate with gruel or barley water, which is infinitely more palatable, and makes an useful operation, a much less formidable one.

To assist PURGATIVES, the common mode seems very well adapted, the drinking of a basin or two of thin broth, or gruel.—The patient's demand for drink, will depend on the briskness of the cathartic, which should be indulged, unless in hydropic cases, where an abstraction, or derivation of fluid is necessary; in these cases, the less drink that is used with cathartics the better.

There are likewise some cases, where the peristaltic motion of the alimentary canal is inverted, or the stomach so irritable,

table, that it will not bear any liquid; then the more solid forms of medicine only, such as pills, can be used, and that with as little drink as possible, to promote the determination downwards.

For the purpose of exciting a DIAPHORESIS, the medicines that are generally administered are of a stimulating nature; the use of which, will often be attended with an increase of heat and fever, unless they are assisted with plentiful dilution; and with this assistance, any class of active remedies, either stimulating, relaxing, or nauseating, will produce a perspiration. In many cases, dilution of itself is sufficient for that purpose; nor is a free and repeated use of it, required at first, to force the extreme vessels only, but likewise to support a continuance of the evacuation; at the same time these ends will be further promoted, by external heat, and avoiding purgatives, or any thing that will determine the circulation to the internal parts.

I have now finished explaining in as clear a manner as I could, the opinion of physicians, and that of my own, respecting a remedy, that I think of as much consequence as any in the practice of physic: and if the perusal of this treatise, should be attended with no other advantage, than that of attracting the reader's attention to a subject of importance, I shall think my time and labour, have not been employed in vain.

F I N I S.