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WHAT IS THE PROXIMATE CAUSE OF
GOUT AND RHEUMATISM?
AND
HOW DO THE BUXTON BATHS CURE
THOSE DISEASES?

WITH DIRECTIONS WHEN AND HOW TO USE THE BATHS.

BY JAMES BYRON BRADLEY,

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Bachelor in Letters and Doctor in Medicine of the University of Paris;
formerly Hospital Staff-Assistant in the Peninsular War;
Physician to the Westminster General and South London Dispensaries;
Lecturer on the theory and practice of Physic in the Blenheim-Street School of
Medicine;*

*Member of the Westminster Medical Society,
and of the Literary and Philosophical Society of Liverpool;*

FOR MANY YEARS RESIDENT PHYSICIAN IN BUXTON.

"Hast ever had the Gout? I have not had it—
But I may have, and you too, reader—dread it!"

Byron.

MANCHESTER:

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1853.

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LONDON:
Printed and Sold by J. B. ROBERTSON, 11, PATERNOSTER ROW.

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P R E F A C E .

The waters of Buxton have, for centuries, obtained a deserved celebrity for their efficacy in the cure of rheumatism and gout. As might be expected, several small publications have, from time to time, made their appearance. In all of these there have been a short account of Buxton and its soil, an analysis of the waters, and the mode of using them; but the *modus operandi*—How do the waters of Buxton cure gout and rheumatism? has hitherto remained a mystery. In every account we read that there are so many grains of solid contents in each gallon of water; that there is a certain quantity of nitrogen or azotic gas; and that it is most probable that this substance plays the principal *rôle* in the cure of those diseases for which these waters have become so eminent. For many years my attention has been directed to the nature of the Buxton baths, and I have carefully watched their effects upon the system. The result of these observations has been, that I have arrived at a theory as to the way in which the Buxton baths are found to be so efficacious

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in rheumatism and gout. I should have advanced this theory at an earlier period, had the analysis lately made by Dr. LYON PLAYFAIR been given before. In the former analyses given by Dr. PEARSON, Sir CHARLES SCUDAMORE, and others, the quantity of nitrogen gas contained in each gallon of water was not sufficient to carry out my theory, and to make it tenable. Dr. PLAYFAIR's analysis (made last year), on the contrary, shews that the quantity of nitrogen gas is very considerably more than had been supposed—quite enough to form, when absorbed, and when combined, another substance that exerts a powerful influence over the diseased actions which constitute gout and rheumatism. I submit it to the consideration of the profession, with the hope that, in due time, other practitioners may be enabled to confirm it.

CHAPTER I.

BUXTON AS A WATERING PLACE.

A great pamphlet is like a great brief or a long deed—a great part of it is useless: therefore I shall make this book as little as possible, and shall avoid giving to the invalid a description of Buxton and its vicinity. Visitors who come here can obtain that information better in one of the Guide Books. He will learn from it where Buxton is situated, the nature of its soil, and the natural history of the surrounding district. My only business is to speak of the salubrity of the place, as there is some connection between that and the motives which bring people to it.

The salubrity of Buxton is almost proverbial:—visitors who enjoy tolerable health, and who do not come here for the purpose of bathing, and even those who do, express their surprise at the feeling of vigour which they enjoy, and at the keenness of their appetite; and the pampered valetudinarian can get sleep here when he can get it nowhere else; so that it has been a matter of wonder to me that it has not been as much frequented during eight months of the year as it is in summer. Indeed there is no reason whatever why it should not be frequented during the winter months, but several why it should:—firstly,

although it may be colder than Manchester or Derby, it is not colder than London in winter, and it is not so cold as Northumberland or Edinburgh; secondly, the baths feel warmer to the invalid in winter than in summer, although their temperature is the same in January as in July: the reason of this I need not say; thirdly, as there never would be so many people in the place in winter as in summer, an invalid would never be obliged to wait for a bath, and he could frequently have the public bath to himself; fourthly, as the hotels and lodging-houses would not be so full, apartments in the latter would be cheaper; and, fifthly, the attendance would be more at command, although a want of attendance is never complained of in Buxton, the keepers of the hotels and of the lodging-houses being distinguished for civility and attention beyond those of every other watering-place in the kingdom.

CHAPTER II.

THE BUXTON BATHS.

At a particular spot in Buxton, and from time immemorial, several springs have issued at the surface of the earth. In what direction the water has travelled, and how far, before it arrives at the surface, is entirely conjectural. These springs are much warmer than springs in general; they are at 82 degrees of Fahrenheit's thermometer, and this degree of heat never varies, and never has varied, throughout the year. It is most likely that their efficacy in curing rheumatism was first discovered by drinking the water, as it is not probable that a bath would be constructed over the springs for the purpose of bathing before their influence had been felt in some other way; and it is likely also that this influence, even by drinking, was discovered by accident, as has been the case with other powerful remedies: thus, it was by accident that Peruvian bark was discovered to be a cure for ague. Over some of these natural springs a large bath has lately been constructed, larger than the one which existed before, and more convenient in every way. It is twenty-six feet in length by seventeen feet in breadth, and four feet six inches in depth. In the marble pavement of this bath are a great many circular perforations through which the water enters into the bath, and as the water is

continually flowing out of the bath, and continually flow-into it, the bather, who is bathing now, cannot be said to be bathing in the same water as he who was bathing half an hour ago. Adjoining to this bath is an elegant edifice of considerable size, having a glazed roof. The entrances to this edifice are by two handsome and capacious corridors: the one leads both to the large public bath already mentioned, and to another twenty-seven feet six inches long by fourteen feet six inches broad, and four feet six inches deep; and at one side of the corridor are two private baths, to which are attached closets for the application of the douche and of the shower bath. The second large bath and the private ones are not supplied with water from the first, as there are two reservoirs which supply them, and into which other springs pour themselves. They have all the conveniences and appliances that can be desired. This part of the edifice is appropriated to the use of gentlemen. The next entrance is by a corridor similar to the other, which leads to a public bath twenty-three feet long by nineteen feet broad, and four feet in depth; and on one side of the corridor are two private baths. These, as well as the others, have closets annexed to them for the douche and shower baths. They are decorated with considerable taste, and are appropriated to the use of the ladies. Great attention has been bestowed upon the dressing-rooms attached to these baths, and, of course, no comfort is wanting.

In the gallery where the corridors are there are two pump-rooms. The water which is drunk in the one is the

same as that of the bath, but, by being conveyed by pipes for a certain distance, it loses somewhat of its temperature. The water which is drunk in the other pump-room is of a totally different nature from that of the bath;—it is a chalybeate, and before it arrives at the surface of the earth it must have travelled in a direction very different from the springs which supply the baths. It contains one grain of iron in each gallon of water, and is an admirable remedy in cases where the exhibition of medicine is inadmissible.

The natural baths of Buxton are so called because they are naturally at eighty-two degrees of heat, and not made so by artificial means. They are sometimes called the thermal, and sometimes the tepid springs of Buxton. The word thermal (*thermos*) cannot with propriety be applied to them, as that word signified among the Greeks a degree of heat much greater than that of these baths. The term tepid (*tepidus*) was employed by the Romans in a vague sense, to imply warmth simply, without reference to a particular degree of warmth; whereas we do not use it in a vague sense, as we mean by it a bath of a certain degree of warmth; but, in order to enable the invalid to understand this properly, I will present to him a table of the different kinds of baths, and will annex to them the degrees of heat by which each is distinguished:—

1stly, The cold bath, ranging from	33	to	63
2ndly, The cool bath,	63	to	75 1
3rdly, The temperate bath,	75	to	85
4thly, The tepid bath,	85	to	92
5thly, The warm bath,	92	to	98
6thly, The hot bath,	98	to	106

From this table it appears that, speaking with rigour, the Buxton baths are temperate and not tepid baths; however, we may, without committing any fault, continue to call them tepid baths, and as has been well observed, “the terms cold, cool, tepid, warm, and hot, are merely relative—the sensation depends entirely on individual susceptibility; that which is tepid for one person is hot or cold for others, and even for the same person under altered circumstances of bodily temperature or health.”* This is quite true, as we know that a person born and bred in Canada or in Norway thinks the weather in England warm when we think it cold. Nevertheless we are obliged to make these artificial distinctions of heat just the same as we make arbitrary divisions of time and of distance.† Were it not for such divisions we would never know where we are, or when we are to act; we would be like a mariner without a compass and a quadrant.

At the other end of the Crescent the warm baths are situated; they are within an elegant structure, having a very tasteful glass gallery on one of its sides. There are two public warm baths—one for gentlemen, the other for ladies. The former is twenty-six feet long, sixteen feet six inches wide, and four feet nine inches deep; the latter is twenty-five feet six inches long, sixteen feet six inches wide, and four feet three inches deep. Added to these

* *Bathing and the Buxton Waters.* By THOMAS CARSTAIRS, M. D.

† La nature n'a point de Sections; nous lui en faisons pour faciliter nos études; nous lui donnons des jalous afin de nous y reconnaître, comme le pêcheur plante une perche dans une rivière à l'endroit qu'il veut remarquer.—*Essai sur la raison et la folie*, par J. BYRON BRADLEY; a work published by me in Paris, in 1827.

there is a large public cold bath. Besides the public baths, there are four private baths for gentlemen, and four for ladies. Annexed to the private baths are closets for vapour baths. The warm baths are not yet completed, but it is the intention of the noble proprietor, the Duke of Devonshire, that they shall be finished in a style surpassing every thing of the kind in England. I need not tell invalids that both at the natural and the warm baths the attendants, men and women, merit the approbation which is always awarded to them.

Besides the natural and warm baths of Buxton, there is one at the other end of the town, which was for a long time more particularly called the *Tepid Bath*. Now, if the natural baths be not strictly tepid, much less so is this, as its temperature is only 64° Fahrenheit. It comes within the range of a cool bath, and as its effects as a tonic have been evidenced to me in many cases, I suggested to the lessee some time ago the propriety of calling it by its proper name—a tonic bath; for it is always better when we know the proper name of a thing to call it by its proper name. If a person have lately had some acute distemper, as typhus fever, for example, and be suffering, as he frequently does, for weeks, and even months, from extreme debility, the use of this bath every other day, and sometimes every day, will be of more use to him than tonic medicines. If a person be labouring under partial paralysis, or from muscular debility, this bath will, in many cases, restore his powers. In cases of gout and rheumatism, this bath is chiefly beneficial when all inflam-

matory action has subsided, and when the slight pain which the patient feels is only the effect of debility of the joints. At this juncture the natural baths have done all that was expected from them, and the patient rejoices that he is returning to his home free from the disease which brought him here, and to make assurance doubly sure, he resolves to stay one week longer, in order to perfect his cure by a few baths more. This is committing a great error, for, to his chagrin, the pain, even acute, returns—and no wonder. The natural bath, from its stimulating property, irritates the joint. It is too much for the debility which alone remains, and a debilitated part is always very susceptible of irritation and of pain. Instead of making assurance doubly sure in the way he proposed to himself, he should have made it so in another way:—he should have quitted the natural bath, and have gone into the tonic one. I shall have occasion, in the course of this little work, to say something about common sense, and the invalid who is gifted with a good portion of this sort of sense, which is the best sense of all, will perceive that, in what I have just said, there is not only common sense, but that it is in accordance with science also. I therefore say that many invalids, to whom age or other circumstances do not forbid it, ought to take a certain number of tonic baths before they leave Buxton.

CHAPTER III.

ANALYSIS OF THE BUXTON SPRING.

It would be futile to present to the invalid the different analyses which have been made from time to time. I imagine that he will be satisfied with knowing what the supposed composition of the water is at the present time according to the best of our knowledge, and to the progress which chemistry has made: but it is due to the memory of Dr. PEARSON to say that he discovered the presence of nitrogen gas in it, because, it will be shewn that nitrogen or azote, when combined with another substance, is the sole agent in producing that state of the system which cures or relieves gout and rheumatism. During the last year a new analysis was made by Dr. PLAYFAIR, whose knowledge of chemistry, and especially the analytical part of it, is so well known, that it is needless to say, that all that science and accuracy could do was done. Dr. PLAYFAIR'S account is so clear that I think it better to present it to the invalid in his own words.

“The following analysis gives the amount and nature of the solid ingredients in one imperial gallon of the water at 60° :—

	GRAINS.
Silica.....	0.666
Oxide of iron and Alumina.....	0.240
Carbonate of lime	7.773
Sulphate of lime	2.323
Carbonate of magnesia.....	4.543
Chloride of magnesium	0.114
Chloride of sodium	2.420
Chloride of potassium	2.500
Fluorine (as fluoride of calcium)	trace
Phosphoric acid (as phosphate of lime)	trace

20.579

On examining the water, there were found present carbonic acid and nitrogen, in addition to the solid ingredients. It was important to estimate the amount of the former in an exact manner. Some of the water was received from the spring into a glass-stoppered bottle, and the stopper was immediately inserted and secured. One gallon of the water was found to contain altogether 13.164 grains of carbonic acid; but, of this quantity, 5.762 grains were due to the carbonates of lime and magnesia, and therefore, only 7.402 grains could, in any sense, be considered as free. Again, the carbonates of lime and magnesia are present as bicarbonates, or, as carbonates dissolved in carbonic acid, and 5.762 grains of carbonic acid would require to be added for this purpose. Hence, of the 7.402 grains, or 15.66 cubic inches of gaseous carbonic acid in the water, only 1.640 grains, or 3.47 cubic inches, can be considered as wholly free and uncombined. “The nitrogen in the water could only be present in solution,

and not in combination ; and, as there is no very accurate method for ascertaining the precise quantity of this gas in the water at any given temperature, it was considered chiefly important to ascertain accurately the composition of the escaping gas, as this would indicate that of the gas held in solution. The following are the analyses of two portions of the gas collected as formerly described, the analyses being given *according to volume* :—

	I.	II.	MEAN.
Carbonic acid	1.169	1.164	1.167
Nitrogen	98.831	98.836	98.833
Oxygen	trace	trace	trace
	<hr/>	<hr/>	<hr/>
	100.000	100.000	100.000

“ The gas, therefore, consists entirely of carbonic acid and nitrogen ; for the oxygen, which did not amount to one-tenth per cent., may be viewed as quite accidental, arising, probably, from the corks used to close the bottles.

“ Judging from the analysis and proportion of the gases, it is assumed that, *at the moment of issue*, the water is charged with 206 cubic inches of nitrogen, and 15.66 cubic inches of carbonic acid. This assumption is founded upon the proportional relation of the two gasses. The proportion of carbonic acid in the water being determined, and the proportion of carbonic acid to that of nitrogen contained in the water being 1.2 to 98.8, the amount of nitrogen contained in the water, at the moment of issue, may fairly be assumed to be 206 cubic inches per gallon.

“ From a consideration of the previous analysis, I am inclined to ascribe the medicinal effects of the water almost entirely to its gaseous constituents. The water,

deprived of its gases, has the composition of an ordinary spring water, with the exception of the fluorine and phosphoric acid, both of which are present in mere traces; and it is therefore difficult to conceive that they can have any medicinal effect when the water is used for baths. The gases are, however, nearly of the same composition as those of the thermal spring, at Bath, and there is no reason to doubt that dissolved carbonic acid and nitrogen may exert important physiological effects. At all events, the singular chemical character of the Buxton tepid water, must be ascribed to its gaseous and not to its solid ingredients.”*

According to this analysis there is considerably more of carbonic acid gas in each gallon than was supposed to be when the last analysis of the water was made by Sir CHAS. SCUDAMORE and Mr. GARDEN, and a vast quantity more of nitrogen gas. All analysts and professional men have come to the conclusion that the medicinal effects of these waters are attributable to the gases, and that the solid contents, amounting to little more than 20 grains, cannot have such a powerful influence over the system as these waters are well known to have. That it is one of these gases, or possibly both, when combined with another substance, I hope to be enabled to shew in the course of this little work.

CHAPTER IV.

ON THE PROXIMATE CAUSE OF GOUT AND RHEUMATISM.

A multitude of books on gout and rheumatism have been written. A great many of these are to be seen upon the shelves of the Royal Colleges of Physicians and of Surgeons in London, and a still greater number in the School of Medicine in Paris. Some are in the learned languages, and the others are in the modern languages of Europe. In those of early date, as might be supposed, every explanation of the proximate cause of gout and rheumatism was attempted upon the principles of the humoral pathology, and that way of considering the cause of the developement of those diseases obtained until the end of the 15th century, and for a considerable time after physicians continued to reason upon the supposition that morbid humours were generated in the system, and at length lodged in some part of the body, and generally in the joints. Whatever differences may be perceived in the opinions of those authors, — GALEN, PAULUS, of Ægina, ALEXANDER TRALLIANUS, &c. &c., as to the nature of the humours, and the way in which they are generated, the result is the same; — that it is a diseased humour which causes the malady; and their opinions are given with great pains by MACROBIUS. Soon after the

doctrine of the humoral pathology was abandoned they began to consider gout and rheumatism upon chemical principles. They observed the appearance of sediments in the urine, and concretions in the joints; and PARACELSUS, in the 16th century adopted the opinion that these concretions were owing to tartaric salts generated in the blood, and was followed by most physicians in Europe until about the end of the last century, when chemistry had made such rapid strides as to enable us to ascertain with more exactitude the nature of things. We were then in the right path. It is clear that in this part of the practice of physic, and in this part only, we had not entirely forsaken the humoral pathology, and we had, besides, chemistry as our hand-maid. At length, in the beginning of the present century, physicians in England talked about plethora as being the remote, occasional, and proximate cause of gout and rheumatism; and soon after referred those diseases to a want of nervous energy, and insisted upon debility of the extreme parts and extreme vessels, owing to this want of nervous energy: and then this doctrine gave way to the doctrine of BROUSSAIS and his followers, who maintained that the occasional cause of gout and rheumatism was dependent upon inflammatory action in the gastro-intestinal mucous surface. Several physicians in England adopted this theory, but it is not a theory that will explain the proximate cause. Latterly, we have begun again to view these diseases in a way that is very near to the humoral pathology; and I apprehend, that not only in these, but in some other diseases, we are

returning to that system, as we find, that by it we can reason more rationally, and more in accordance with chemistry and with the advanced state of physiology. We condemned the humoral pathology too hastily, because some of its parts were decidedly faulty, just as some men condemn a religion because some of its dogmas are faulty, and even because some of its professors happen to be notorious sinners. The opinion that has prevailed for the last forty years among the majority of physicians is, that gout is an accumulation of humours in the relaxed vessels of the ligaments of joints and tendons connected with them; and, if this be the case in gout, I am certain that it is the case in rheumatism. This is approaching the truth, but it is not arriving at it. To arrive at it, we must know what it is that accumulates in the relaxed vessels of the ligaments and tendons; we must know how the accumulation gets there, and when we know these, we shall then know how rheumatism or gout is developed,—in other words, we shall know what is the proximate cause of gout and rheumatism.

CHAPTER V.

We have seen in the last chapter the opinions which have, from time to time, prevailed respecting the proximate cause of rheumatism and gout, and if any of them had been definite, if any of them had been intelligible, we should, ere this, have been better enabled to direct our medical appliances. We must search for the proximate cause in a more tangible form—in a form which, if not evident to the senses, is plain to the conception; a form not so speculative, but one to which we can attach a clear idea. Now, to do this, let us begin by stating that it is well known to physiologists and those acquainted with animal chemistry that a great deal of ammonia enters into the composition of animal bodies, and it is not surprising that it should do so, when we consider the quantity of azote which we are continually inspiring every moment of our lives from the atmosphere.*

It is also now decided that a certain portion of lithic acid enters into the composition of the blood, and this

* It may not be presuming too much when we presume that there may be some invalided visitors who do not know that in 100 parts of atmospheric air there are 89 parts of nitrogen or azotic gas.

ithic acid in the blood ought to be, when a person is in health, in a state of solution and not of suspension.* Besides lithic acid, other substances, called lithates and phosphates, are generated in the human system, and, whether they be the result of what we eat and drink matters not;—there they are, for we see them in the urine, when a person is suffering from gout or rheumatism. Now, both these must have been in the blood or they could never have got into the urine. Blood is conveyed by the emulgent arteries to the kidneys, and when in these elaborate organs the fluid, called urine, is secreted from it, and passes into the ureters, which convey it to the bladder.

In an unhealthy state, atoms of lithic and phosphatic compounds, that is to say, atoms of lithates and phosphates, having lost their fluidity when in the circulation, are separated from the blood when in the kidneys, and pass along with the urine into the bladder,—and these are what are called lithic and phosphatic deposits.

Now, if these deposits, when in the blood, are sometimes in a state of solution, constituting the state of health, and at other times in that of suspension, *frequently* causing disease, it is clear that there must be some cause of the one and of the other. I believe that

* Every invalid does not know the difference between solution and suspension. Add a small quantity of salt to a tumbler of water; the salt becomes dissolved, and the water remains as transparent as before—this is solution; but, instead of salt, add a very small portion of flour, rhubarb, or of any such substance, and the water remains turbid. The particles or atoms of the flour, &c. are not dissolved, they are suspended or floating in the water—this is suspension.

there are two causes. I believe that a certain quantity of ammonia, and a certain degree of heat are necessary to continue the state of solution, and it will follow, of necessity, that the absence or deficiency of either of these agents will be productive of the other : in other words, that there ought to be a certain degree of heat, and a just proportion between the ammonia and the lithates and phosphates, in order to keep these in a fluid state, and intimately mixed with the blood, and forming part of it, though not necessarily forming part of it. I say, not *necessarily*, because, though lithic acid may be a component part of the blood, we have no reason to think that lithates and phosphates are ; some authors believing that certain kinds of food are the causes of such products : but as yet our notions about food are very crude ; we talk a deal of nonsense about it because a deal of nonsense has been written. When, therefore, there is a want of ammonia in the human body, the lithic and phosphatic compounds, losing their fluidity, assume the form of atoms, and, being in the circulation, make their way to some part of the surface, or to the interior of a joint, and thus gout or rheumatism is developed.

Before I proceed to describe the way in which this development takes place, I will offer an example familiar to every one, and though it may not be exactly the same process, it is yet very similar. When a person has common sore eye, the conjunctiva,* or thin membrane,

* The practitioner will understand that any explanatory word or phrase is intended for the invalid, and not for him.

which covers the front of the eye-ball, becomes red, swollen, and painful; sometimes intensely so. How are these effects produced? The vessels of the conjunctiva are not intended to receive the red globules of the blood; they are too small; they are scarcely perceptible, except under the microscope: but, when the conjunctiva is inflamed, the red globules are propelled into them; hence, that part of the eye which was before white becomes red; the vessels being turgid with blood the conjunctiva swells, and the pain is caused by the presence of foreign bodies in them, for the red globules are nothing but foreign bodies when in the conjunctiva: they have no business there. They occasion pain by the distention which the vessels undergo, and also by the irritation which takes place in their internal and extremely sentient coat, something similar to the irritation caused by particles of sand being blown into the eye. Now, the developement of gout or rheumatism, I believe, takes place in the following way:—There being a want of ammonia, and sometimes also a want of heat, the lithates and phosphates in the blood lose their fluidity and assume the form of atoms, and being suspended in, and flowing with, the blood, occasion no inconvenience whilst they are in vessels of sufficient calibre, but when they arrive in those vessels which supply a joint, the mischief begins. There, the vessels, except a few large ones which proceed further, are intended to supply and nourish the tendinous and ligamentous expansions which surround the joint, and also the thin cellular substance which envelopes the whole. These

vessels are the extreme branches of vessels, which are themselves, extremely small, consequently, they are so minute as to be scarcely perceptible ; however, the lithic and phosphatic atoms, are propelled into them. The first indication is a slight pain, and, as there is a constant accession of atoms, the pain increases ; then swelling of the joint ensues, sometimes, as in the knee, to a very great size, and the process is accompanied with redness soon after the swelling begins. We can easily comprehend the causes of these three phenomena—the pain, the swelling, and the redness. They are nearly the same as in the case of the inflamed conjunctiva. The minute vessels are loaded with lithic and phosphatic atoms, as well as with some red globules. The atoms, being foreign bodies, cause great irritation, and at the same time great distention : and it is this irritation and distention that create the excruciating pain. The cause of the swelling is obvious,—there is a large collection of a substance (the atoms) in all the vessels surrounding the joint in every possible direction which was not previously there ; and the redness may, in part, be attributed to the red globules, and to the atoms themselves, for it must be remembered, that they were immersed in a red fluid. That they are not red globules entirely, but are lithic and phosphatic atoms or globules in a great proportion, may be inferred, by asking this question,—Why does a joint, attacked with gouty or rheumatic inflammation, rarely suppurate ? In pure inflammation, caused by a blow, or any other cause, we know that the vessels are loaded with red globules,

and we know that suppuration is as frequently the termination as resolution. But it is not so in gouty or rheumatic inflammation, and the inference is, that the vessels are distended with something different from red globules, and something not so prone to assume the action of suppuration. With what then can they be distended? I cannot think of any thing except the lithic and phosphatic atoms, and the thin parts of the blood, with *some* red globules. It will be said that suppuration does sometimes occur, although it be very rarely. In such cases it is not unscientific to conclude, that a greater proportion of red globules is mingled with the lithic and phosphatic globules than ordinarily. It will be said again, that when a person has had several attacks of gout or rheumatism he is subject to severe rheumatic or gouty pains in the joints, and, yet, there is no redness, and very little or no swelling. In this case, I believe that the atoms, by mere accident, are propelled into the internal parts of the joints, and that those vessels which supply the enveloping cellular substance escape. The same may be said when they enter the vessels of the periosteum, tendo Achillis, &c. We said above, that a certain quantity of ammonia and a certain degree of heat, were necessary to hold the lithic and phosphatic compounds in solution; but, as it is useless to make an assertion without affording a proof, I shall advance one for the present, and shall wait until I arrive at another part of this book before I adduce others. When a person is in a perfect state of health, and entirely free from gout or rheumatism, the

urine is quite transparent, and when it has been kept a certain time, it exhales the odour of ammonia, and *sometimes before it has been exposed to the atmosphere*. When we pass those public and indecent places which we see in large towns, and generally close to public houses, the odour of ammonia is so strong as at times to be overpowering. Men of all grades frequent those places, and the presumption is, that they are in a state of health, free from gout and rheumatism, otherwise they would not be there. When the same persons are suffering from either of those diseases, when there are lithic and phosphatic deposits in the urine, there is generally no odour of ammonia; but, as they get better, as the deposits become less and less, the odour of ammonia becomes more and more sensible, until, at length, when quite well, the odour is quite evident, and if not evident to the nose, it can be detected by experiment. The very reasonable conclusion to be drawn from this fact is, that when there is a sufficiency of ammonia in the system, gout or rheumatism is not developed; and, that when there is a disposition to form lithates and phosphates, either by our mode of living or by other causes, and that there is not, at the same time, a sufficiency of ammonia to keep them in a state of solution, that then gout or rheumatism is developed. I have endeavoured to explain how, according to my theory, a want of ammonia conduces to these diseases. I will now inquire how the abstraction of heat from the human body may be an occasional cause of the same maladies. A gentleman, when travelling, may

unluckily, be put into a damp bed; a man, when intoxicated, may lie down and fall asleep upon the wet grass; a person, after being greatly overheated in a large assembly, or, after having viewed iron foundries, may expose himself to the open air and inadvertently throw open his coat; another may travel thirty or forty miles upon the outside of a coach, in cold weather, or may get wet, and thoughtlessly sit some time in his wet clothes: all of these, and several others, cause an abstraction of heat from the human body, and may be the occasional cause not only of rheumatism but of gout, also. In the two first cases, those of the damp bed and the wet grass, the patient, on awaking, feels intolerable pain in the back; he cannot turn without great difficulty. In all the cases he is, in a few hours, seized with a shivering, the sensation of cold is very great, not so much in the trunk as in the extremities, and more in the lower than the upper, especially the thighs: in a few hours more he feels pain in one of the joints, more frequently in the knee; this is rapidly succeeded by swelling and redness, and thus a severe attack of acute rheumatism is developed, which confines the patient to bed, sometimes from five to six weeks. How has this abstraction of heat occasioned all this suffering? The occasional cause was the abstraction of heat; but what was the proximate cause? We all know that caloric, the principle of heat, keeps many bodies in a state of solution, and that the abstraction of this principle tends to solidify them. I believe then, that the proximate cause is the same as when there is a defi-

ciency of ammonia ; that the caloric necessary to keep the lithates and phosphates in a state of solution (supposing these to be in the blood at the time) being taken away, the ammonia, itself, is not sufficient to hold them in that state, that they lose their fluidity, assume the form of atoms, and produce rheumatism or gout in the way I have supposed. Why is gout always, or most generally, first developed in the great toe? The patient, upon the first attack, awakes about two or three o'clock in the morning with severe pain in that part. When he rises, he finds it red and swollen. In nine cases out of ten he does not know what it is, until somebody tells him that it is the gout. I ask, why is it first developed there? We know that the heat of the blood in the heart is about 104 degrees, that without the heart it is about 102, and that as the blood recedes from the heart its heat becomes less and less, so that, when it has arrived at the furthest point from the heart, viz. the great toe, it has lost a considerable portion of its caloric. Now, suppose that, from the causes mentioned above, there are the elements of lithates and phosphates in the blood, and that there is, at the same time, a want of ammonia,—if, added to these, there be a want of heat in the blood, it is not surprising that gout should first develope itself in the great toe, this being at the greatest distance from the heart, and its blood having consequently less heat than in any other part of the body. This appears to be a satisfactory solution of the question, and I am not aware that it has ever been given before. To some practitioners the idea of lithic and

phosphatic atoms flowing in the blood may not be acceptable ; but, let us ask, are not the red globules in the blood? What are they but atoms? Are there lithic and phosphatic deposits in the urine when a person is suffering under certain maladies? They are there, because we see them ; and what are they but atoms? Were these atoms, before they were separated from the blood in the kidneys, not in the state of atoms, but always intimately and *inseparably* combined with the blood? If so, we should never see either lithic or phosphatic deposits in the urine, for we cannot suppose that the change from the fluid to the atomic state takes place only when the blood arrives in the kidneys, and that it is the mechanism of these organs which converts them to the form of atoms. I believe that the mechanism of the kidneys has only the power to separate them, *being already formed*, from the blood, and to discharge them into the ureters, through which, generally, but by no means, always, they find an easy passage to the bladder. I say, generally, for, sometimes, the atoms combine and form particles ; these, again aggregate by the addition of more particles, and form small culculi, causing great pain in the kidney, and, after their escape from the kidney, passing with great difficulty through the ureters into the bladder, where, if not expelled with the urine, they remain, growing larger and larger, by the constant accession of fresh particles, and thus beget that disease of agony, stone in the bladder. That lithic and phosphatic atoms exist in the blood in gouty and rheumatic derangements of the system is evident

from the deposition of earthy matter that takes place in the joints of the fingers and toes. These, after a person has been long a sufferer from rheumatism or gout, become so changed in form that they no longer look like fingers or toes. The very minute vessels which supply the tendinous and ligamentous expansions of these small joints become gorged with these deposits; at length, they burst, the atoms find their way into the interstices, and into the very minute cells of the cellular substance which surrounds the joints, and there they remain as long as he lives. Now, any one acquainted with the anatomy of the kidney will know, that if these atoms were separated from the blood only when in the kidney, they must *necessarily* continue their natural course to the bladder; that they could not, by the very structure of that viscus, take a retrograde movement and re-enter the circulation, and be deposited in the fingers and toes.

Finally, that the proximate cause of rheumatism and gout is what I suppose, and what I have endeavoured to describe, may be inferred, if not proved, by a phenomenon which takes place in podagra aberrans (wandering gout), and we may say, in wandering rheumatism, for, I am sure, that rheumatism wanders more than gout. When a person has either of these diseases in a joint, it not unfrequently shifts suddenly to some other joint, or, may be, to the stomach, heart, &c. How can this happen, or, how can it be explained, except upon the theory which I have advanced? It is futile to talk of sympathy. We know that a sympathy exists between the brain and the

stomach, and we know why. We know that the par vagum, or eighth pair of nerves, comes from the brain and goes to supply the stomach with its branches, so that one of these organs cannot be affected without the other sympathising with it:—a person has a foul stomach, and he complains of head-ache; he receives a severe blow upon the head, causing compression of the brain, and he vomits. We know the cause of the one and of the other—the head-ache and the vomiting,—because the par vagum explains it: but, we cannot suppose any sympathy to exist between the foot and the stomach or heart, for there is no anatomical connection that we know of, nor physiological fact depending upon that connection, to lead to such a supposition. The sympathy that occasions loss of appetite and a quickened pulse, when a joint is inflamed, is only the result of febrile action pervading the whole constitution, and is not the physiological sympathy of which we are now speaking. No, we must seek for the cause of this phenomenon in a way more real and less imaginary, and the theory of lithic and phosphatic atoms being arrested in the minute vessels of a joint, and thereby developing gout and rheumatism, will explain it in a satisfactory manner. The atoms, having arrived at a joint, and having developed gout or rheumatism in the way I have supposed, at length, by the force of the circulation, and, perhaps, by other causes, are enabled to pass through the capillaries, or extreme and almost imperceptible terminations of the arteries, and thus get into the veins. Here, they get into the round of the circulation again,

and are again arrested in some other joint, or may be, in the very minute vessels of the coats of the stomach, or some other vital part. This explanation of a phenomenon so frequent, and one which has baffled the researches of the profession for ages may not be pleasing to practitioners of the old school: it is too plain and intelligible for them; too mechanical and tangible. They would like the pathology better if there were more of mystery in it,—that old stale leaven that has been so long mixed up and kneaded with all our theories. Alas! it is this very leaven that has prevented our making that progress in our art that has been made in the other sciences. We prize it like an heir-loom, because it adds to our dignity.

Among the objections which will be raised against that part of my theory which assumes a deficiency of ammonia as the *occasional* cause of gout and rheumatism, it will be asked,—How can there be a want of ammonia in the system when we consider the quantity of azote which we are continually inspiring every moment of our lives from the atmosphere—azote being one of the constituents of this substance? The answer is, that azote is not ammonia. There may be abundance of azote, but not enough of the other component part to form enough of ammonia. A thing taken by itself in chemistry, is a very different thing when combined with another. What can be more different than hydrogen gas, or inflammable air from water? Yet water is nothing but hydrogen combined with oxygen. The former (hydrogen gas) when ignited, creates a vast and terrible explosion, frequently immola-

ting hundreds of human beings in a moment ; but, when combined with the latter, would be used to prevent an explosion. Another will say, that there is a deal of azote and some ammonia in animal food : how comes it then that men who eat a deal of animal food are more subject to gout than those who do not ? I do not believe this to be true. I do not believe that men who eat a deal of animal food are more subject to gout than those who do not. It is not the animal food, but the drinks that are taken with, and after it, that predispose to gout and rheumatism* A great many butchers in London, and perhaps elsewhere, eat animal food four times a day. They who drink moderately of beer and still less of spirits have rarely gout ; but those who indulge much in beer and spirits have frequently gout or rheumatism. It will be asked again, how is it that a person, who has been long subject to rheumatism, will have an immediate attack of the disease, upon receiving a fall upon any of the joints, as the shoulder, elbow, or knee. The fall or blow (for a fall is a blow) could not so suddenly convert the lithates and phosphates flowing in the blood from the fluid to the atomic state,—besides, there may be at the time, a sufficiency of ammonia in the system ? This is one of the many instances when we call a thing by a name which is not its name. In this instance, we call that rheumatism which is not rheumatism. The joint, from repeated attacks of disease has become exceedingly

* I find, since, writing the above, that Dr. ERASMUS DARWIN, was of the same opinion.

weak and tender ; it is this weakness and tenderness that render it so susceptible of pain, redness, and a slight degree of swelling. There is nothing rheumatic in it, and the external applications that will cure it, would not cure it, if it were rheumatic. A person who has had repeated attacks of rheumatism cannot kneel down upon the bare floor longer than two minutes. He is obliged to finish his devotions sitting or standing. He knows that the pain he suffers is owing to the tenderness and weakness of the joint, and never imagines that it is rheumatism. The only difference between the fall and the kneeling is the degree of pressure in both, and in neither case is the effect of that pressure rheumatism.

It will have been gathered, ere this, that I consider gout and rheumatism to be the same disease in their developement. The remote causes may be different ; the occasional causes are frequently the same, and, I believe, that the proximate cause is always the same. Every body in England talks of rheumatic gout, and every body in France of gouty rheumatism, *la rheumatisme goutteuse*. A person will have the disease in the instep, ankle, or hand, and will consult two practitioners on the same day. The one will say that it is rheumatism, and the other will maintain that it is gout. From such a discrepancy, there is but one conclusion to be drawn—that they are so much alike that it is impossible to tell one from the other. All gouty and rheumatic patients think the same. They have a common saying amongst them, too trite to repeat, but which expresses their conviction of the similarity, if

not of the identity of the maladies, and the only distinction that I have ever heard practitioners make, is that gout is fond of attacking the small joints, and that rheumatism prefers the larger. There is nothing in such a remark except its flippancy. If this doctrine of the proximate cause of rheumatism and gout shall be found to be based on truth, I shall rejoice that I have opened a path that will lead to a more correct way of viewing these diseases. During the many years that I practised in London, I suffered occasionally from one or the other. For the last seven years that I have resided in Buxton, I have been comparatively free from both. *Non ignara mali, miseris succurrere disco.**

* The Latin scholar will perceive that I cannot make "*ignara*" masculine, without vitiating the verse.

CHAPTER VI.

HOW DO THE BUXTON BATHS CURE GOUT AND RHEUMATISM?

In the last chapter I endeavoured to answer the first question that gives the title to this book, viz.,—What is the proximate cause of gout and rheumatism?

In this I shall attempt to answer the second, viz.,—How do the Buxton Baths cure those diseases? From what has been already said, relatively to the want of ammonia being the occasional cause of gout and rheumatism, the reader will, no doubt, expect that the Buxton Springs supply that substance; but, on looking over the list of solid contents as given in the analysis, he does not find one grain of ammonia: nevertheless, I shall show that the Baths supply the component parts of that substance, and that in an eminent degree, that they are absorbed within the system, and that it is the absorption of ammonia that cures gout and rheumatism; but, before I shew this fact, I wish to speak somewhat of the effects of ammonia when given internally, as a curative means in cases of rheumatism. One hundred years ago, when a practitioner was called to a patient suffering from an attack of acute rheumatism, he prescribed, as a matter of course, the old *spiritus Mindereri*, now called “liquor

ammonia acetata." This is made with what is now called sesqui-carbonate of ammonia and distilled vinegar. It was given by the practitioner with the intention of promoting perspiration, and the more the patient perspired, the less acute he expected would be the symptoms, and the sooner the malady would be subdued. This mixture combined with other ingredients having the same tendency, continued to be administered for half a century upon the same principle, and always with curative effect; but, in the course of time it was observed that a patient would perspire profusely although he had taken no medicine whatever, and that there was no alleviation of the symptoms. It was suspected then that the beneficial effects could not arise from the perspiration; they must be from some other cause; but what that cause was no one could tell. They went on prescribing, and still go on prescribing the same remedy upon the same principle, still supposing that it is the perspiration that relieves the patient, and yet knowing that profuse perspiration, occurring spontaneously, will afford no relief. The fact is, that it is not by perspiration that ammonia alleviates the acute symptoms; it is upon a different principle. It acts as a solvent—it dissolves the lithic and phosphatic atoms collected in the small vessels of the joint, they are restored to their state of fluidity, and re-enter the circulation. The swelling subsides, the redness vanishes, and the pain ceases. I will give another example of a false conclusion to which practitioners cling even at the present day. Every body knows that guaiacum has been long held in high estimation as a

medicine in the cure of rheumatism. It was formerly prescribed more frequently than at present, having lost somewhat of its reputation. There have been always two preparations of this drug ; one, the simple tincture, made with spirit of wine, and the other, called the volatile tincture, made with ammonia. Every practitioner knows that the simple tincture affords no relief in rheumatism, and therefore, when the surgeon-apothecary tells his pupil to send a mixture containing guaiacum to a rheumatic patient, he takes care to tell him at the same time that he must use the volatile tincture, and not the simple. Upon being asked by the youth, why ; he gives him the best answer he can,—he says, that the spirit of ammonia in which the guaiacum is dissolved, is a more diffusive stimulant than the spirit of wine—that it diffuses the drug more throughout the system, and thereby enables the guaiacum to exert a more general influence over the disease. Now, there is a much better answer than that. He should tell him that the guaiacum has nothing to do with it ; that it is the ammonia in which it is dissolved, and that this latter would have the same efficacy without the guaiacum. If it were the guaiacum that exerts a curative effect it would do so in the simple tincture, for, although the simple tincture may not be so diffusive as the volatile tincture, it is sufficiently so to carry the drug to all parts of the body. If we notice the external applications from time immemorial in cases of rheumatism we shall find an endless variety of ointments, embrocations, and liniments. Most of them do no good, nay, most of them do positive

harm. There are but two that really do good. They are the old opodeldoc, *when we add ammonia to it*, and the liniments composed of ammonia and oil. Why are these efficacious, and the others not? It is that the ammonia contained in them is absorbed, it acts as a solvent upon the lithic and phosphatic atoms with which the multitude of small vessels are loaded; they are restored to their fluid state, and easily pass from them into the circulation. Some practitioners will say that there is nothing new in the idea that ammonia acts as a solvent, for the two other alkalis—potass and soda—have, for sixty years, been employed as such in cases of gravel and calculi in the bladder, and ammonia is an alkali. That we know, and we know that preparations of potass are used for weeks together in rheumatism, and the patient ordered to drink plentifully of soda water; but, I do not know that ammonia has ever been used as a solvent in gout or rheumatism. It has been, and is still, used, as I said before, in acute cases, but as a sudorific, in order to promote perspiration, and not with the intention of acting as a solvent to restore to a state of solution the lithic and phosphatic atoms flowing in the blood, and filling and distending the minute vessels of joints, membranes, the periosteum, the minute vessels of muscles, though rarely, the valves of the heart and its great vessels, the bag that encloses it (the pericardium); nay, the walls of the heart itself. It is now necessary to tell the gouty and rheumatic invalid two things, in order to enable him to comprehend the chemistry of my theory, as regards the *modus operandi* of the Buxton baths. I

must tell him what ammonia is, and also what water is. Ammonia is a binary compound, consisting of two component parts—hydrogen and nitrogen. The equivalents, or relative proportions, are one of nitrogen and three of hydrogen. Water is also a binary compound, consisting of two component parts—hydrogen and oxygen. The equivalents are one of hydrogen and one of oxygen. When a person looks at the baths, he sees a large volume of water, perfectly clear and transparent, in each imperial gallon of which there are about 20 grains of solid contents, these being, when in the water, of course, in a state of solution. He sees, also, very distinctly, bubbles of nitrogen gas rising to the surface of the water, and where they appear to burst. This nitrogen gas is free; it is not combined with the water. Now, when a person is immersed in the bath several millions of the pores of the skin of the individual are continually absorbing portions of the water, and, of necessity, portions of the nitrogen, and, I believe, that when these two substances are absorbed—the water and the nitrogen—that, by some operation of animal chemistry, a decomposition of the water takes place; that its hydrogen separates from its oxygen, and combines with the nitrogen, and thus forms ammonia, and that it is the absorption of this ammonia that cures gout and rheumatism. Here we have the discovery at once of the way in which the Buxton baths cure those diseases, and, like many other discoveries in science, when explained, we wonder that it could not be seen before. It is admitted, by practitioners, that it cannot be to the solid ingredients that

the efficacy of these baths is owing, because common spring water contains nearly all of them. It cannot be to the nitrogen alone, because we are every moment of our lives, inhaling by the lungs a quantity of that substance from the atmosphere. It cannot be to the water, either as a compound, or to either of its component parts, for, in that case, every river would be as efficacious. To what then is their efficacy owing? It must be to the formation of ammonia. But as this assertion does not demonstrate the fact, it will be necessary to advance something like a proof that it is so. When a patient arrives in Buxton, suffering from chronic gout or rheumatism, his urine does not emit the slightest odour of ammonia; but, when he has taken several baths, and sometimes when he has bathed but three or four times, the odour of ammonia is sensible, and when he has taken twenty or twenty-five, it becomes so evident as to be undeniable. I admit, that occasionally the urine does not impart the odour of ammonia, although the patient may have taken twenty or twenty-five baths; but I declare, that most generally, I have had reason to think, that the progress of the patient's cure has been in the ratio of the sensible odour of ammonia in the urine whilst his system has been under the influence of the baths.

This odour of ammonia cannot arise from any medicine which the patient may have taken; for, frequently, I have not prescribed one grain of medicine, save small doses of rhubarb; nor can it be due to any change of diet, for the patient has lived in the same way as he did before he came.

Now, if the urine of a patient do not emit the odour of ammonia before he has bathed, and if it do emit it after he has bathed several times, and if the same patient have not taken any medicine, or changed his diet in any way, to what can the presence of that odour be owing but to the absorption of ammonia from the baths? I mean to the absorption of those component parts that will form ammonia when combined. We know that those component parts are in the bath, viz., the nitrogen, and the hydrogen of the water, and the just and scientific conclusion is, that they have combined and thus have formed ammonia, and I do not see how we can gainsay this conclusion. Take two persons, both of them in tolerable health. Let the one take a small quantity of sesquicarbonate of ammonia, and in a short time he feels a glow of heat and a slight increase of vigour. Let the other go into the bath for six or seven minutes, he will experience exactly the same sensations. Let the former repeat the dose of ammonia for several days, and slightly increase the quantity. Instead of vigour he will have a feeling of languor, of increased heat and of thirst; his tongue will be slightly furred, and the pulse quickened. Let the bather continue to bathe for several days, and remain in the bath half an hour,—he will be exactly in the same state as the other. Let this latter continue to take the ammonia every day, and in a few days all the above symptoms will be aggravated—the languor, the heat, and the thirst; the lips will be parched, the tongue more furred, the quickness of the pulse will amount to

febrile action ; there will be pain in the head and loss of appetite. Let the bather still continue to bathe, and remain the same time in the bath,—he will be axactly in the same condition as the other. Let this again go on, taking the ammonia ; there will be more violent fever ; the eyes will be red and inflamed. Let him go on only two or three days more, and he will have the symptoms of phrenitis. Let the bather, in the state in which we last left him, still go into the bath every day, and remain in it during an hour,—he will be in the same condition as he who has been taking the ammonia internally. This parallel is true as regards the majority of people. I say the majority ; because, occasionally, a man will bathe every day for a month, and remain in the bath half an hour, and experience no inconvenience. I must here observe that I have known only three or four persons who could use the baths with such impunity. They have been in the habit of visiting Buxton for years, and have gradually prolonged the time of remaining in the bath. They were all what are called free livers. It was to them what custom is to many in drinking spirituous liquors ; they can bear a great deal : whereas, if a person go into the bath for the first time, and remain in it half an hour, the effect will be so marked as to occasion the notice of all about him. I will relate a case. Some years ago a medical practitioner of considerable eminence in Manchester was brought hither after having had a most dangerous attack of acute rheumatism which had seized the heart, and had rendered the recovery of the patient almost hopeless. He was

accompanied by his wife and a friend, a physician of London, and was placed under my direction. His friend was desirous to bathe once in the Buxton bath before he returned home. I advised him not to remain in it longer than five or six minutes; but, to use his own expression, he "felt the water so delightful and buoyant," that he continued in it half an hour. In two or three hours, and during the rest of the evening, he talked so wildly, so loud, and so much at random, as to surprise the friends whom he had accompanied. They knew that he had taken but three or four glasses of claret after dinner, which was his usual custom, and could not account for this strange excitement. What could be the cause of this excitement? This is one of those cases in which we are left to decide the cause of a thing by deciding what cannot be the cause. It could not be by the absorption of any or of all the solid contents of the bath, for they are almost all in common water, and those which are not, are in so small a quantity as to be scarcely perceptible. It could not be by the water alone, for in that case, every river would produce the like effect. It could not be by the carbonic acid gas, for that is in too small a quantity. It could not be by the nitrogen, for, instead of excitement it would occasion dizziness, stupidity, and torpor. To what then was this effect owing? There are but six substances in the whole range of the materia medica that could produce such an effect—they are alcohol, the æthers, camphor, quinine, valerian when taken to excess, and ammonia. I need not tell the invalid that the first five of these substances are

not in the bath, nor are there any ingredients in the water that can by any possibility when combined form any of them. But the component parts which form ammonia are in the baths, the hydrogen of the water, and the free nitrogen gas; and that they, when absorbed, do form ammonia, I think is sufficiently proved by all I have said. Some practitioners will say, all this is very plausible, but still it is all inferential. Who can say that a decomposition of the water takes place when it is absorbed, and that its hydrogen separates from its oxygen and combines with the nitrogen, and thus forms ammonia? The only way of answering this question is by putting a similar question. Who can say that it is not so? The one question is as pertinent as the other, and both are exactly of the same value: that is, the former does not weaken my theory, and the latter does not strengthen it. Other practitioners will be satisfied with the inferences which they will deem conclusions; but, not so with the chemist. His science teaches him to believe and to adopt nothing that cannot be proved in his own way. He requires tests,—he exacts that every thing relating to his art shall be subjected to experiment. I will offer him two with which he is quite familiar. The presence of ammonia in the urine may be detected by the nose, also by adding a portion of lime to the urine. If ammonia be present, the volatile alkali will be disengaged. Again, take a pint bottle of urine, pierce the cork with a portion of a tobacco pipe, cork the bottle tight, having previously added one or two drams of acetum destillatum. If ammonia be present, the ammo-

niacal gas will escape. Hold a muriatic acid stopper over it, the two fumes meet, and form a chloride of ammonia. These experiments I have repeated again and again upon the arrival of a patient, in whose urine there were sediments, red, pink, yellow, or brown. Before he bathed, neither the nose nor the tests could discover any ammonia, but, after taking several baths, the presence of ammonia has been detected by the above experiments. I admit, that occasionally I have had patients whose urine has contained sediments, and in which the odour of ammonia was evident; and I have had others whose urine has not imparted the odour of ammonia after bathing, nor have the tests succeeded in detecting any. In the former cases we must suppose that there was a great quantity of lithates and phosphates in the system, and that the ammonia was not in proportion. In the latter, we must suppose that some patients are not so susceptible of absorption as others; the skin may not be in a condition favourable to absorption, and there may be other causes with which we are totally unacquainted. Before I conclude this chapter there is a very principal question to be asked and answered, and which many readers will think should have been the first to be asked and answered, for, upon the answer given, affirmatively or negatively, depends the theory of the *modus operandi* of the Buxton baths. Will ammonia dissolve lithic acid, the lithates, and phosphates? Not willing to trust to my own knowledge of chemistry I have applied to a scientific friend in London, eminent for his acquaintance with that science. "Lithic acid is soluble in

excess of any alkali. The lithates are sparingly soluble as found in urine, but they are all soluble in excess of their bases, if an alkali be the base, whether ammonia or other alkali; so are the alkaline phosphates." These facts show us the reason why some cases are not benefited by the Buxton bath until the patients have remained here for three months, whilst others derive a marked benefit in three weeks. The lithates and phosphates being only sparingly soluble except in excess of ammonia, it is necessary that the system absorb a great quantity of that alkali in those long and obstinate cases of gout and rheumatism, when the joints are loaded with lithic and phosphatic atoms; when they are immovable and cannot perform the actions of flexion and extension. Some invalids will imagine that, if my theory be correct, nothing more will be necessary than to be continually taking ammonia internally, to ward off rheumatism and gout, or to cure them when present. Their medical attendants will tell them, that to take ammonia enough to cure gout or rheumatism of long standing, or, even to subdue the disposition would be to destroy the mucuous membrane of the stomach and intestines. Many powerful medicines may be applied in considerable quantity to the skin, and, through the medium of the pores affect the system not only with safety, but with benefit, but require to be administered by the mouth with the greatest caution: such are laudanum, iodine, preparations of lead and of mercury. Ammonia, taken without judgment, would exert a direct and injurious action on the stomach and bowels;

but, given judiciously, may partially check the rheumatic and gouty disposition, but, to hold that disposition in subjection, and to cure effectually these diseases when confirmed and obstinate, the system must be under the influence of a large quantity, and there is no way of doing this but by the frequent and persevering use of the Buxton baths.

CHAPTER VII.

ON THE PROPER WAY OF USING THE BATHS.

In the practice of physic there ought to be a great deal of science and some common sense. The practitioner will supply the former, and, generally, the patient can supply the latter. I say, generally, because, sometimes the very first thing an invalid does, on his arrival at Buxton, is to do that which common sense tells him he ought not to do. He asks the advice of some other invalid, how often he should bathe, and how long he ought to remain in the bath, &c., as if his own case, and all the others, were exactly alike. Ladies will seek information from the bath women, who, as well as invalids, are always ready to give it. It is surprising what a propensity some men and many women have to recommend some medicine as a specific in certain cases. They always seem to have a great pleasure in knowing and telling something which they imagine few people, besides themselves, know or can tell. The greatest minds have been subject to this weakness. The late Lord Erskine was always more pleased and flattered by being told he was a good physician, than that he was a great lawyer. If any of his friends were sick, he was impatient to pay a visit that he might have an opportunity of prescribing. His patients had always the

courtesy to take the prescription, but were too wise to take the physic. The invalid should consult some medical practitioner in Buxton, and it matters not whom he consults, for there is no one who can advise him better than another. If his case be not one suited for the Buxton baths, I am quite sure that every practitioner in the place will recommend him to return home. Well, we will suppose, that the invalid has common sense enough to consult a practitioner immediately; this latter will ascertain, by enquiries and examination, whether there be any disease of the heart, the lungs, the liver, the spleen, the stomach, the intestines, the kidneys, or any other of the viscera; if the patient be subject to determination of blood to the head. If none of these be present, he will then direct him when to bathe, what bath he should use, how long he should remain in it, and how often he should repeat it.

To shew the invalid the necessity of obeying implicitly the injunctions of his medical adviser, I must here explain to him the principle upon which medicines are ordered in sickness, why they are divided into doses, and why a certain interval should take place before the dose is repeated. The state of health is produced by the due and correct performance of all the functions of the human body,—the circulation, the respiration, the digestion, and all the secretions; and we hear, and see, and smell, and taste, and feel, and think, by the due and correct performance of the functions of the brain. When all these functions are performed correctly, we say, in medical phraseology

that there is a healthy action in the system, and when any of them is not correctly performed, we say that there is a wrong action, and it is this wrong action that constitutes disease. Now, a medicine is given to combat this wrong or diseased action by creating a different action, an action which gradually lessens the force of the other, and at length subdues it. If we cannot create a new action, or an action more powerful than the other, we make no impression upon the diseased action. Sometimes we excite a diseased action in order to combat another diseased action, as, when we give mercury in siphilis to the point of salivation we excite a diseased action because the action which we excite, although diseased, is not so dangerous to the system as the one which it is intended to displace. This is the principle upon which we administer a medicine. If, in the treatment of disease, our first intention be to produce a new action, our second is to continue or keep up that action, and, in order to do this, the medicine is repeated in a given time, before the action which we have produced expires, because, if the interval be too long and the action have expired, instead of progressing, we are only again beginning. This is the principle upon which a medicine is divided into doses and given at certain intervals. If the action which we create become inordinate, or too violent, we suspend the use of the medicine, or lessen the dose, or prolong the interval. Now, what is the Buxton bath but a medicine? It is used with the same intention as a medicine, and its administration ought to be upon the same principle. All this the practitioner's

science teaches, and a patient's common sense could never teach it. What I have said being well understood, the first thing to decide is, what sort of bath the patient ought first to have. It is a common practice here to direct two or three warm baths to be taken before the natural Buxton bath is used. In many instances this is good advice, but there are cases where the patient ought never to have a warm bath completely, and where it is only allowable to have a semi-cupium, or half a bath—I mean a bath up to his hips. A person will be subject to occasional difficulty in breathing, he thinks he is asthmatic. There is no actual disease of the lungs, and the cause of the difficulty is purely conjectural both to the patient and the practitioner. In another person the action of the heart is heard distinctly on the right side; there is no disease of the heart, and the patient experiences no inconvenience except he run, or mount a staircase hastily. Such persons ought never to go completely into a warm bath. It produces perturbation in the circulation, and the patient is soon after seized with difficulty of breathing, which lasts for several hours. I cite such cases to show that it is not always proper to take a complete warm bath in the first instance. There are patients who ought never to go into the natural bath. In some of these cases there is no apparent reason why they should not, except the reason that the natural bath never agrees with them. They are disordered for the rest of the day; and there are cases in which the natural bath is entirely forbidden; as, for example, when a patient is subject to serious determinations

of blood to the head, marked by dizziness, drowsiness, pain in the head, most frequently at the back of it, and flushing of the face for the time being. If there be any affection of the heart, or of the lungs; if there be disease, or even congestion of the liver, the spleen, or the kidneys. If the stomach, intestines, or peritoneum have been very lately acutely inflamed; if there be chronic inflammation of the bladder; if there be gall-stones in the gall bladder, or in the duct that leads from it to the intestines; if there be calculi in the kidney, or in the ureter,—in all these cases the natural bath would be harmful; yet, in all of them, except in extreme cases, the rheumatic or gouty patient may derive more than partial benefit by a very careful and judicious use of a bath at 90° . In the case of the medical practitioner from Manchester, to which I alluded before, and in which the rheumatism had seized the heart, the natural bath, at first, was out of the question. The heart, after having been inflamed, is very prone to re-assume the inflammatory disposition upon the occurrence, or rather application, of any occasional cause. The natural bath, from its stimulating properties, would have been a decidedly occasional cause,—the heart would have re-assumed the inflammatory action, and, although it had recovered itself once, it could not have done so again, because, in its then debilitated state, it would not have had the power. A warm bath at 98° , or even at 96° , would have produced such perturbation and acceleration of the heart's action, that the result would have been the same. A bath at 90° , appeared to me to

be the safe and judicious medium. There was not one untoward sign during the time he remained in it (fifteen minutes), and it was repeated several times, and gradually lowered, until he could, with safety, go into the natural one. It will be gratifying to the invalided visitor to be told, that this patient returned to his home perfectly well in three weeks, from his first arrival in Buxton. If none of the causes mentioned above prohibit the natural bath, the patient may be at once put under its influence, and, by so doing, he gains time, because, a bath of even 90° , is not, truly, the Buxton bath,—and in the administration of this bath (the natural one) the practitioner must be guided by the same principles as in the exhibition of a medicine; for, as I have said before, the Buxton bath is nothing less than a medicine. Hence it is, that he ought to see the patient the day after, to mark the effect which the bath has produced, to see if that effect continue, or, if it have expired. To say that a patient, in all cases, should bathe two days together, and omit one, is to act in direct opposition to that therapeutic principle which I have, with some difficulty, endeavoured to render intelligible to the invalid. Many patients can bathe every day with safety and advantage for ten or fifteen days, and others can only bathe every other day; and this is not surprising, when we consider the difference of constitution, of strength, and of habits; but, especially, when we recollect the stimulating properties of the substance which I believe to be absorbed, namely, ammonia, than which there are few more powerful in nature. When the action or effect pro-

duced by the bath becomes inordinate, the use of it should be suspended as in the case of a medicine, or a longer interval allowed to elapse before it be repeated. Inordinate action is known by langour, quick pulse, thirst, pain in the head; in short, by febrile action. These effects may be most generally prevented by remaining in the bath only five or six minutes. A patient should not prolong the time suddenly, he should do it gradually, and in no case should it exceed ten minutes. If it be the practitioner's science that tells the patient all this, there is another thing which the patient's common sense will tell him without the aid of the practitioner: it is that, instead of going home and trying to keep awake, he ought, if his limbs and the weather permit, to take moderate exercise by walking about. I am, of course, supposing that he has just taken a natural bath, for, after a warm bath, that same sort of sense will tell him to do exactly the contrary; that is, to go home and to remain quiet. The patient should also take care not to go into the natural bath whilst feeling cold. Cold has the power to contract the pores of the skin, and thereby to render them unfavourable to absorption, and, hence, it is, that he feels chilly for several hours after having taken the natural bath; besides, the substances which should be absorbed, not having been absorbed, no influence is obtained over the malady. To procure the sensation of heat, he should, if he can, walk about before entering the bath; and if he be taken in a chair, he should be clothed and wrapped sufficiently to procure it. If he be going into a warm bath, this precaution is not necessary. Many

people have an idea that going leisurely into a bath is attended with risk. There is some truth in this as respects a cold bath. The sudden application of cold to the lower extremities will contract the arteries and veins of those extremities; less blood can flow into their arteries, and, consequently, more remains in the trunk and brain; and, if a man be subject to determination of blood to the head, walking slowly into a cold bath may be attended with risk; but, going slowly into a bath at 82° , like that of Buxton, cannot be attended with danger; however, as it is always better to be upon the safe side, the bather may dash some of the water with his hand upon his head, face, and neck. If a patient have strength and courage to jump at once into the bath, he may do so. The time when a person should or can take a bath does not always depend upon himself or the practitioner. He may not always be able to get one before dinner, and, I need not warn him, whether he be in health or not, against the danger of going into a bath, warm or cold, immediately after a full meal, and with some people, even after a moderate meal. The most dire consequences have arisen from it, not only in Buxton, but all over the world. The process of digestion should be completed, and this requires a period of from three to four hours in people of tolerable health; and in those suffering from dyspepsia, or who have a weak stomach, it is not completed until the expiry of five or six. If he cannot get a bath at a suitable time, he must dine either very early or very late. If a patient be taking the warm baths, he should drink his tea after-

wards rather cool, because warm tea always throws him into a perspiration, and after having taken three or four warm baths, he is so weakened that he is obliged to suspend the use of them for some days. Some patients can take a natural bath as early as six o'clock in the morning. They are people who have all the marks of muscular vigour; but a lady or gentleman of delicate frame and irritable fibre cannot do this without being disordered for the rest of the day. This disorder is not caused entirely by the bathing, but also by the early rising. No saying is so trite as that early rising is conducive to health, and that use is second nature. It is a vulgar error which, like all vulgar errors, has its origin in ignorance. It originates in ignorance, because early rising is not, in some constitutions conducive to health; and use is not nature, and the expression second nature is an absurdity. The only piece of truth in it, or to speak more correctly, the only true meaning in it is, that a man may do that, from habit, which occasions to him no inconvenience, and yet what he does may be quite contrary to nature. Before I conclude my observations on bathing, I must say something with respect to the exhibition of medicines during the time the patient is under the influence of the bath. There is little to be said. Constipation can always be prevented by drinking a tumbler of the water at St. Ann's well, and if the urine be turbid and have a thick sediment, this water has a surprising power in clearing it in three or four days. Although the direction to drink it slowly in order to watch its effect has been given by all writers, it is proper that I

should repeat it here. It occasionally causes dizziness, so that the patient can scarcely stand. If it produce that effect to a great degree, it must not be repeated. In accordance with my theory, I am in the habit of prescribing ammonia, with the view of aiding the bath, and of combating the gouty and rheumatic diathesis. A great deal of it cannot be taken internally from the causes mentioned before. As the sesquicarbonate of ammonia would be too stimulating even in small doses, if continued, I am obliged to exhibit it in the form of an acetate, and this is easily done by adding an exact proportion of acetum destillatum to it. The distilled vinegar combines with the ammonia and dissolves it, and the carbonic acid of this latter is disengaged. It can be rendered very palatable by the addition of simple syrup; and if it occasion a slight diarrhœa, which it is very apt to do, a small quantity of the syrupus papaveris, or of syrup of ginger may be added. In those cases where a patient cannot take the syrup of poppy on account of its giving headache, or syrup of ginger from its stimulating property, I have added a quantity of the infusion of humulus. This corrects the tendency of the mixture to act too powerfully on the bowels, it is not stimulating, and it does not affect the head. It must not be supposed by the invalid that I am writing a code of instructions by which he may be able to manage his own case. I have spoken but generally of the treatment, of gout and rheumatism. No two cases in the whole range of diseases are exactly alike, and hence it is impossible to write such a code, and the patient, who expects it, expects too much. He expects us

to teach him to do immediately what has taken us many years to learn. Besides the thing is impossible, for no patient who is not a practitioner can treat himself. To treat a case of disease requires that a great deal shall be understood from what has been previously learned. This is the science, and if the patient had all the common sense of his father and his grandfather added to his own it would not be enough to teach him this science. There are two sorts of people who sometimes commit an egregious folly, a patient and a suitor. The former will determine to treat his own case, and thereby does himself irreparable harm, and the latter determines to plead his own cause, and thereby runs a risk of losing it. Some women have more fancy for this dabbling in physic than men. They have some slight ailment, and read nothing but medical books; they are soon really ill. It is a difficult and painful task to attend these ladies. They are always obtruding their own opinions and instructing us. It would be much better if they would read romances and novels, for if these do no good, they do not make women ill.

CHAPTER VIII.

A FEW WORDS ON CLOTHING.

I am not unfrequently surprised on being first consulted by a rheumatic or gouty gentleman to learn that he has never worn worsted stockings or flannel drawers, or even flannel waistcoats. A rheumatic or gouty person should wear lambswool stockings and flannel drawers all the year round, and should throw off the waistcoat only during the months of June, July and August. May is often too cold, and September is too uncertain. He ought always to wear an overcoat when he goes out from the beginning of November until the end of March, and he ought during these months to sleep between the blankets, but he ought, on no account, to sleep in his stockings. Any other regulation with respect to clothing, the patient must decide for himself, and this he can do better than any body can tell him.

CHAPTER IX.

ON DIET.

If there be any part of the practice of medicine in which a patient's common sense will avail him more than in another it is in the article of diet. MR. ABERNETHY used to remark that all that a practitioner could say to a patient about eating and drinking could be said in ten minutes, and I once heard DR. BAILLIE say something very similar. Of all the sensible things which those great men uttered, there was none more sensible than that. In all acute maladies a very few injunctions are necessary, and these can scarcely be said to be so, because every wife, and mother, and nurse are acquainted with them. They all know that in such distempers every thing that is stimulating is prohibited, and that nothing but the most simple nourishment and the most simple drink are allowable. In chronic diseases, when an invalid has suffered long, and when he has arrived at a certain age, he knows what he ought to eat and drink better than any physician can tell him, and he knows this from experience. If he be young, he will not have this knowledge, and merely because he has not bent his attention to it. To such an invalid I should say that he may eat whatever kind of meat he wishes, provided it be not highly seasoned, and thereby too stimu-

lating; with this reservation, that he finds it agrees with him. It is the same with vegetables. He may eat whatever kinds he likes; always with the same reservation. Nothing is so common as to prohibit certain sorts of vegetables, from the supposition that they produce acidities in the stomach, and that acidities engender gout. The term acidities is a vague phrase. We can attach no definite idea to it. We do not know how they are produced, and what is more, we do not know, in many cases, whether they are produced or not. It is one of those expressions in the practice of medicine of which we are very fond. There is a little of mystery in it, and it is a piece of that old leaven of which we spoke before. Very often, what we call acidities is nothing but flatulence, and this would have been prevented if an acid like vinegar had been taken with the vegetable which caused it. I have known gouty and rheumatic people advised not to eat green peas, asparagus, and fruits, and even to drink their tea and coffee without sugar. I recommend them to eat all these things, and never to drink coffee or tea without sugar. What a gouty or rheumatic invalid drinks requires more consideration. All fermented liquors taken too largely aggravate the disease. If a person have been in the habit of drinking scarcely anything but water, it is as well that he continue to do so; yet, I have known among such people that taking a glass of porter, or two or three glasses of wine, or a little spirit and water after dinner, or at night, has seemed to check the rheumatic and gouty disposition. If he have been in the habit of taking these things freely, it

would be imprudent to leave them off entirely. He would be obnoxious to the disease upon the application of any occasional cause, and upon the first occurrence that he found himself compelled to take them, even in moderate quantity, he would most likely have a severe attack. Some people will say that a man can never be obliged to take them even in moderation. This is talking foolishly. There are occasions when courtesy or good fellowship, or the artificial rules of society compel him, and there are few members of society who are exempt from these laws. It is like a man prating about philosophy, and firmness, and self-denial. It is an easy thing for an educated man to talk well and sensibly about philosophy, yet he finds it as difficult to practice it as a man who cannot talk about it at all. There is a constant warfare carried on between the stomach and the brain—I mean between the appetite and the understanding,—and the stomach generally comes off the conqueror. It is the practice here with many invalids to be very abstemious during their stay. This is a very bad practice. A patient's common sense, which, as I have said before, is the best sense of all, ought to tell him that, whilst his system is under the influence of the baths, it ought also to be under the influence of the same mode of living as he knows he will be obliged to resume when he returns home. If it be not, the habitual mode being resumed, will act as an occasional cause, and there will be either a development of the disease, or the disposition to development will be reproduced. Of course, the reader will understand that I am not speaking of

gluttons and drunkards, but of men who eat and drink with moderation; and as many invalids ask me what moderation is, I should say that moderation is a relative term, for that which would be moderate in one person would be immoderate in another. If a man's position be such as to forbid him to drink wine, and he have been in the habit of taking one or two glasses of beer at dinner, and one glass of spirits and water in the evening, he may continue to do so, and that would be moderation; but if the same man were to take, whilst here, three or four glasses of beer in the day, and two or three glasses of spirits and water in the evening, he would be doing what was beyond moderation. A gentleman may have been in the habit of taking a glass of beer and a pint of wine at dinner, and this would be moderation in him; but if the same gentleman were to double this quantity of beer and wine, he could not be said to be moderate. It must be observed that both these invalids may be directed by the practitioner to take much less, because he perceives that it is too much. Madeira and pale sherry are better than brown sherry, and why pale sherry is better than brown, I cannot tell; I only know that it is so. Port wine seldom agrees with a gouty or rheumatic subject; and with respect to spirits, I may say that gin is the least injurious; after that whiskey. Rum and brandy do not generally agree with these diseases; I mean when the invalid suffers only gouty and rheumatic pains, and has not any derangement of the functions of the stomach, when, very frequently, weak brandy and water agrees with him best.

The different effect which different rums will produce on gouty and rheumatic subjects is surprising. Jamaica rum, when not new, may be drunk with safety, if drunk in moderation; whereas, if a gouty or rheumatic person drink the same quantity of Demerara rum, he would most likely have an attack of sub-acute rheumatism or gout. Yet there are exceptions to these rules. I have attended two ladies in the same house, and at the same time. One could drink a glass of bitter ale at dinner without inconvenience, but if she took, instead of the beer, a glass of weak brandy and water, her pains were greatly aggravated; whereas the other lady could take the brandy and water with safety, but if she took the beer instead, her pains were in like manner aggravated, and the two cases presented no appreciable difference.

It was the custom thirty years ago, and it may be so yet, for the practitioner to say to his gouty patient, "avoid malt liquor as much as possible. You may drink Madeira, or sherry, but do not drink port or spirits; above all, avoid punch! The lemon juice and the sugar will always give you an attack." It is only six or seven years since a physician of eminence in London wrote a pamphlet to show the curative effects of lemon juice in rheumatism, and if it will cure rheumatism, it will cure gout, if these diseases be, as I believe, the same in their development. I know some gouty gentlemen who cannot drink two or three strong glasses of spirit and water without having an attack of the disease, whereas they can drink the same quantity of punch with impunity. A person will be

seized suddenly with violent rheumatic pain in the shoulder, extending down one side of the back: the pain is so excruciating that he flies to any thing to give him relief. He takes immediately hot spirits and water of some sort, and he finds relief after three or four hours; whereas the pain would have ceased before the expiry of an hour if he had taken with the spirits a sufficient quantity of lemon juice. I am not directing gouty and rheumatic people to drink punch. I make these remarks to prove the truth of what I have stated, that an invalid must learn himself what he can drink as well as what he can eat.

Many gouty and rheumatic people, like many other people, use tobacco in one of its forms. There are three ways in which tobacco is used—smoking, snuff taking, and chewing. The two latter habits are considered to be more nauseous than smoking, and it has been observed, with truth, that the more nauseous a habit is, the greater is the difficulty to conquer it; thus, the chewer finds it more difficult to conquer his habit than the snuff taker, and this latter more than the smoker. Smoking much produces constipation, and habitual constipation is frequently the remote cause of piles. It tends to produce this disease in another way, because a man who smokes much must sit much, and we know that a sedentary life tends to their production both in men and women. Much smoking occasions determination of blood to the head, and thereby confuses the memory. It is true that whilst smoking, he has not this confusion, but he experiences it when not under the influence of his pipe or cigar.

I believe that intense smoking will engender rheumatism in a system where the disposition did not previously exist, and if a patient be just recovering from a severe attack of gout or rheumatism, and still feel great pain in the ankle or instep when he walks, it will be weeks before he gets rid of it if he continue to smoke as much as usual. The gouty and rheumatic subject will therefore attend to these remarks as much as he pleases.

The practice of taking snuff is very ancient. Hippocrates, the father of physic, has left us some receipts for sternutatories. They were not generally used as an indulgence, but as a medicine in certain affections of the head, as deafness, dimness of sight, when they were supposed to stimulate the auditory and optic nerves. They were also used upon the principle of revulsion in discharges from the ears and eyes. I doubt much whether they were of the slightest use in any of these cases. Hellebore was a principal ingredient in these snuffs or sternutatories, and tobacco, of course, did not enter into their composition, as that plant was then unknown in that part of the world. There is a greater variety of snuffs in England than in any other country. The black snuffs seem to act chiefly upon the nervous system, and the pungent brown snuffs as Lundy-foot's, Wilson's, and Scotch, upon the circulatory. I suppose that the black snuffs contain more of the tobacco leaf than the brown, and that these last owe their pungency to other ingredients. A snuff taker cannot take snuff when he is ill, and especially if his illness be accompanied with any febrile action. He has, for the time, as great a disin-

clination for it as he had when a boy, and it is a certain sign of the cessation of febrile action when he feels a desire to take it. To a person who only occasionally takes snuff the black snuffs cause a nervous feeling, whereas the brown pungent snuffs create rather a feeling of excitement, because they quicken the circulation. If a person be recovering from an attack of gout or rheumatism, and have still some pain in any of the joints, a pinch of pungent snuff will aggravate the pain, and the quickness of the pulse will be instantaneously increased from fifteen to twenty beats more in the minute. Hence he ought not to take a grain of snuff until he be perfectly well. Snuff taken largely occasions constipation like intense smoking; nevertheless, in the morning when there is constipation one pinch of snuff or half a cigar will very frequently act as a mild aperient. The gouty and rheumatic subject will attend to these remarks on snuff as much as he pleases, I repeat as much as he pleases, because I know that he will please himself, notwithstanding all that may be said to him.

Hitherto I have spoken of diet only as it regards gouty and rheumatic subjects, supposing that there is no functional derangement of the stomach or other of the abdominal viscera. When there is a deranged state of the functions of the stomach, liver, and intestines, more caution is necessary, and the patient generally observes it. It is especially in these cases that the patient knows the best what will agree with him, and he knows it from repeated trials. When a patient is comparatively young, and has not had sufficient time to learn what an older

patient has learned, a general direction may be given to him: for example, we may tell him to avoid spirits entirely, to drink very little beer, and very little wine, and this last only when it is old and pure, for new fiery wine is worse than spirits: to smoke little, and, if he can to avoid snuff entirely. In eating, we may tell him to avoid veal, the lean of bacon, hard ham, or any kind of meat that is tough, fried fish and fried meat, the hard waxy potato, old carrots and old turnips, pastry, puddings made with flour, either baked or boiled, buns, crumpets, and muffins, new bread, or very stale bread. All these things we know will not agree with him, and as to anything else, we don't know whether they will or not. He must learn that himself, and if he find that he requires an aperient, which he generally will, he must not take any purgative except rhubarb, and occasionally small doses of colocynth combined with blue-pill, and these two latter only when they are absolutely indicated. Salts and senna and jalap and gamboge and aloes and calomel always do harm.

Many people suffer grievously when the functions of the stomach and liver are gravely deranged. They are continually complaining, and so is the practitioner who attends them, that, notwithstanding all they try, nothing seems to better the condition of these organs. One thing, in many cases, has escaped the observation of both practitioner and patient—the source of the malady. The fact is, that it is not in the stomach, or in the liver, or in the intestines, that originate all this disorder and consequent discomfort. The remote cause is in the mind. It is the

anxiety produced by the cares, and perplexities, and difficulties of life, and I may add, the fears, for difficulties cause fear. This anxiety sooner or later affects the stomach, and the invalid will remember the close sympathy that exists between the stomach and the brain. It refuses the usual quantity of food, and what it receives is not completely digested. It passes into the duodenum, the first of the intestines, in an imperfectly concocted state. This condition of the stomach cannot last long without the liver becoming affected, because the healthy action of the liver depends upon the healthy action of the stomach. The bile secreted in the liver becomes vitiated, or too small in quantity, or too large. This state of the liver cannot last long without the intestines becoming affected, because the healthy action of the intestines depends upon the healthy action of the liver. These three viscera being so deranged, the whole system is affected from head to foot, because these viscera are the spring and fountain of health and of disease. Some men in such a state avoid what they know from experience will disagree with them, but others betake themselves to deceptive means. They smoke immoderately to lull care, and take snuff immoderately to produce a certain hilarity, and a certain abstraction of mind, and they take spirits to produce both. This is adding fuel to fire. The stomach is more and more excited, and this over excitement produces a consequent debility, and irritability of an organ is always a consequence of debility. The brain now sympathises with the stomach. What was at first only anxiety, is now morose-

ness and irritability. Ere long the heart, that grand machine, becomes affected, for the blood is now vitiated, and how can it be otherwise, when the chime, the chyle, the bile are vitiated. The vitiated blood supplies and nourishes the heart. This obeys no longer the stimulus of healthy blood which was natural to it, but of vitiated blood which is strange to it. Were it not for this vitiated condition of the blood, the heart itself would not become affected. It would perform its actions undisturbed, propelling the blood through the round of the circulation, regardless of the existing havoc in the corporeal system. The irritability of its muscular fibres increases, and its actions are accelerated. It communicates this acceleration to all the arteries. Debility, in proportion to its irritability, ensues, and the circulation becomes irregular. Too much blood is sent to some of the abdominal viscera, and too little to others. Organic disease takes place in them, and now, from organic disease and debility, the secretory vessels secrete too much, or the absorbents absorb too little. The feet and legs swell, then the thighs, and very soon there is evidence of water in the abdominal or thoracic cavity. When the collection of water is in the abdomen, and but small in quantity, or when there is no evidence of any being there, the patient sinks gradually, and life becomes extinct without much suffering; but when it is in large quantity, the suffering is greater: the water pushes up the diaphragm, and the respiration thereby becomes impeded, and in this case life is extinct sooner than in the other. It is when water collects in the

chest that the sufferings of the patient are more aggravated ; for the water compresses the lungs, the air-cells cannot receive enough of atmospheric air ; hence the blood is not sufficiently oxygenized in passing through the lungs, and when it arrives at the left cavities of the heart, it has not enough of oxygen, the very essence of life, and retains too much of carbon, the very essence of death. The secretion of water continues, and the compression of the lungs becomes greater and greater. The air received is less, and the blood is consequently more carbonized. Now, the lungs themselves compress the heart, and impede its actions. Its movements become laborious because it combats not only with the compression, but because there is not enough of oxygen in the blood that the heart may be obedient to its stimulus. It does not send enough of blood to the circumference, not because it wants the power, but because it is prevented from using it, and what it does send is not the blood of life ; it is the blood of death ; and it is at this moment that the circumference begins to die. But the heart has not begun to die ; it would resume its wonted activity, were the impediments to that activity removed, and were its natural stimulus restored. But death is approaching and encircling it on every side, until all around it is dead ; but yet it lives, and yet it struggles with death, and the rapidity of its action shows the violence of the struggle : but the struggle lasts not long. Its action becomes slower and more feeble ; at length it ceases : but the effort is renewed ; again it ceases ; once more a feeble movement is felt—and the wondrous engine

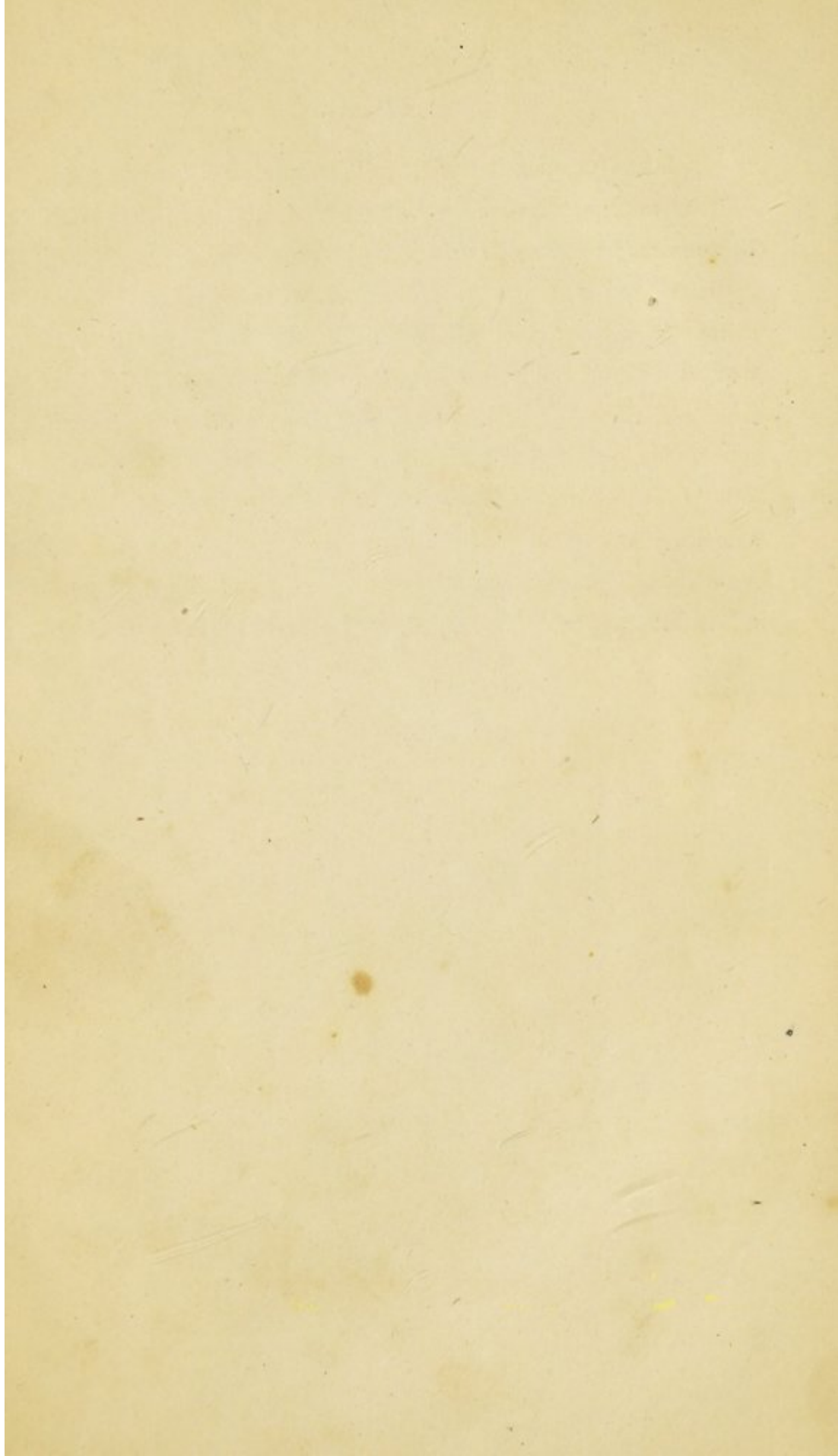
stops for ever. This is death from the circumference, but there is death from the centre. In the former the circumference is the first to die, and the heart is the last to live. In the latter the circumference is the last to live, and the heart is the first to die.* In both cases the spectacle is the same; a body that is lifeless, and which one hour before possessed vitality and intellectuality, having relation with the world and with all around it, and having now no more relation with mankind than if it had lived and died before the deluge.

Long before this consummation, long before there was organic disease, when there was only derangement of the stomach and liver, an intelligent patient might be supposed to say to his medical adviser, does your noble art, which has ceased to be conjectural, and which has now become a science, suggest no remedy for my discomfort? Does the sum of the experience of so many ages with which so many of you are acquainted, supply no aid from the mineral, the animal, and the vegetable kingdoms? can medicine do no more? This question, in somewhat similar words, was put to me twenty-five years ago. I was not able to give so good an answer then as I am now. I should now say, yes, there is a remedy, and a sovereign remedy too. It is not medicine, although I shall not banish medicine from my aid. It is temperance and sobriety, and in eating and drinking nothing that will keep up the irritation of the stomach, and thereby of the mind. If you can confine

* The practitioner who is acquainted with the admirable work of BICHAT, "Sur la vie et la mort," will perceive that I am not purloining from him, but that my description differs somewhat from his.

yourself to water, so much the better, and, if you cannot, resolve never to take more than one glass of ale to dinner or supper: drink wine but seldom, and drink no more than two or three glasses, and never taste it if it be bad wine. Abstain entirely from spirits, and if at times you think you cannot do without them, drink negus instead. Check the use of tobacco, and never take snuff before dinner, nor after dinner, until digestion be completed, for snuff produces excitement, and if excitement be continued it produces febrile action, and digestion is always impeded by febrile action. A strict observance of these rules produces that equanimity of mind which bears a near relation to tranquility. It imparts that self possession which disarms disquietude, and neutralizes anxiety; thereby enabling a man to rouse his energies so as to exert his genius and his talent; whereas, in the absence of this equable feeling these qualities are paralyzed in many minds. It happens that, at the moment when a man most needs all the resources of ingenuity and of energy, he is bereft of them by the very fact of his urgent need of them. After living in this cautious way for two or three months, after abstaining from everything which his experience and common sense tell him to abstain from, he finds that his stomach requires more food, that it can digest it better, for he has not the usual discomfort after eating. This improved state of the stomach cannot last long without the liver partaking of the benefit: the bile it secretes is better in quality, and more regular in quantity. Before, it was bad, and too little or too much. This improved state of the

liver cannot last long without the intestines partaking of the benefit, for the bile not being so acrimonious as formerly, the mucous membrane and the muscular coat of the intestines are not so irritated, and being in due quantity, the intestinal canal performs its functions with more regularity. He is now restored to health, and it is now that he ought to see that it is the only reality in life, and that all other things are dreams: but he does not see it, now that he has it. He saw it only when he had it not, when he was suffering pain and discomfort, and ere long he again considers dreams as realities, and continues to do so until he awakes from his last dream just before he is going to sleep for ever.



Faint, illegible text, possibly bleed-through from the reverse side of the page. The text is arranged in several lines and appears to be a formal document or letter.