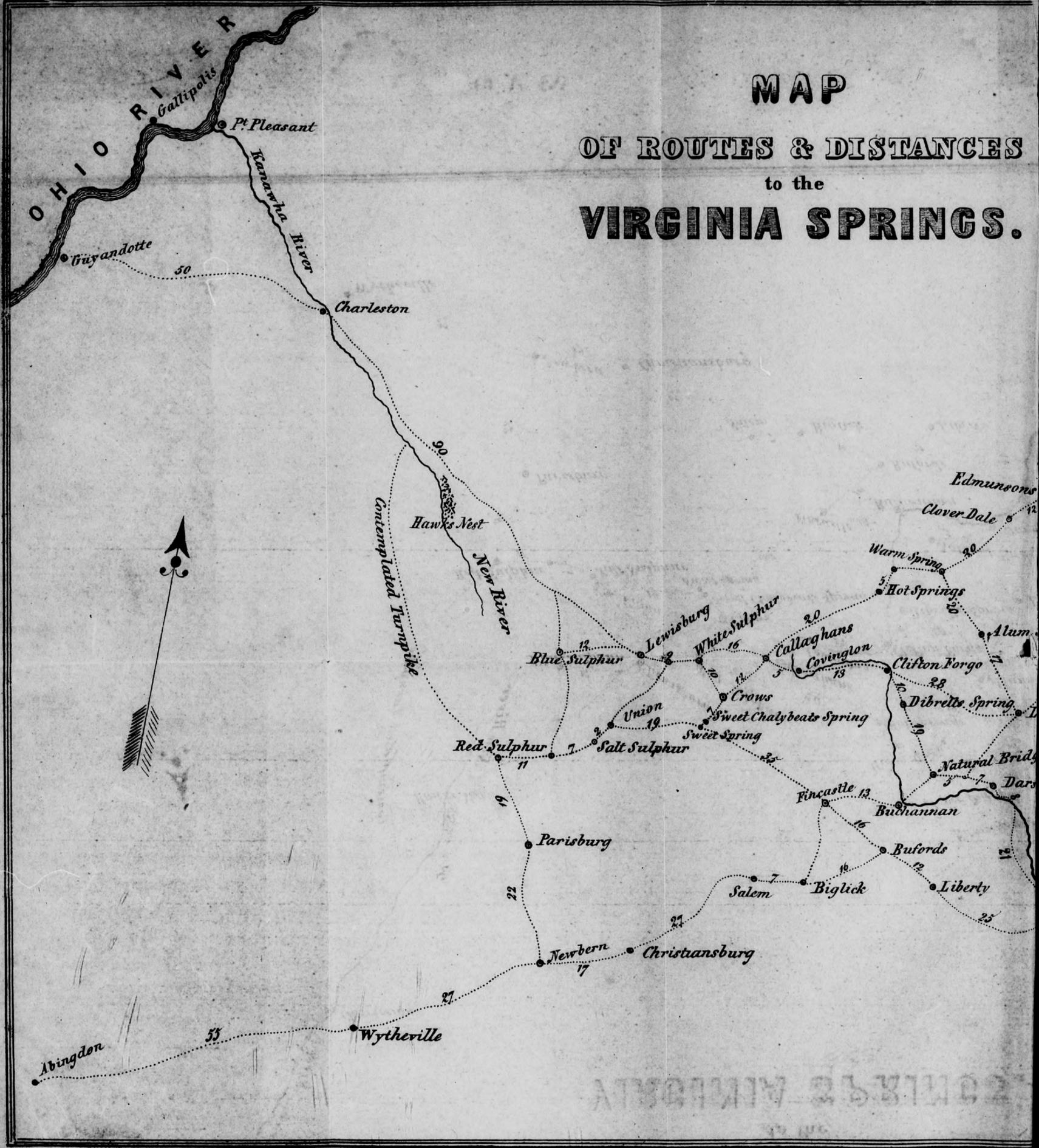
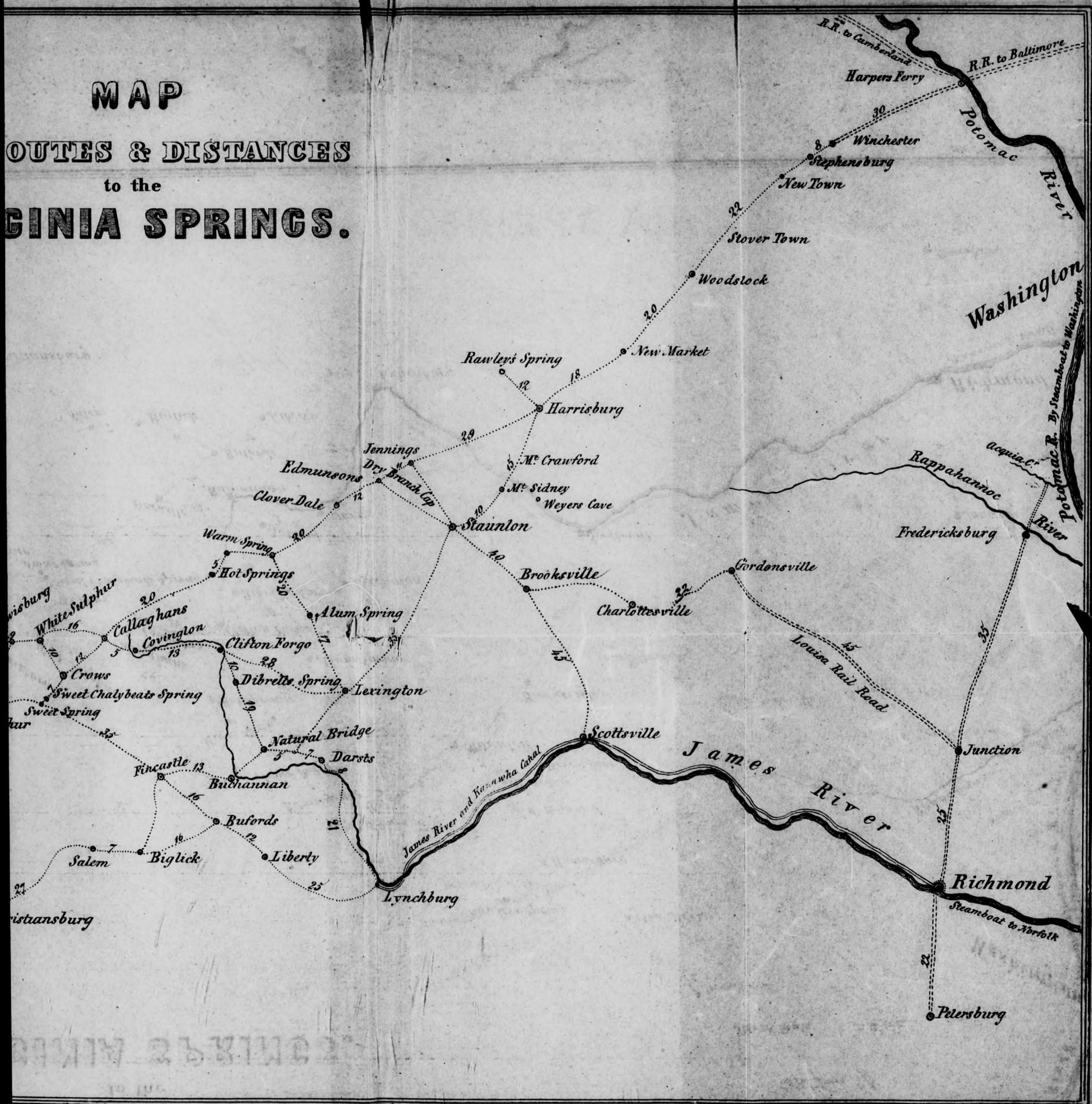


MAP OF ROUTES & DISTANCES to the VIRGINIA SPRINGS.



MAP

ROUTES & DISTANCES to the HOT SPRINGS.



11

THE
VIRGINIA SPRINGS.
WITH THEIR
ANALYSIS;
AND SOME
REMARKS ON THEIR CHARACTER,
TOGETHER WITH A
DIRECTORY
FOR THE USE OF THE
WHITE SULPHUR WATER,
AND AN
ACCOUNT OF THE DISEASES TO WHICH IT IS
APPLICABLE:
TO WHICH IS ADDED, A
REVIEW OF A PORTION OF WM. BURKE'S BOOK ON THE
MINERAL SPRINGS OF WESTERN VIRGINIA, ETC.
AND AN ACCOUNT OF THE
DIFFERENT ROUTES TO THE SPRINGS.

BY
JOHN J. MOORMANN, M. D.
RESIDENT PHYSICIAN AT THE WHITE SULPHUR SPRINGS.

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PHILADELPHIA:  
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TO THE PUBLIC.

FOR many years I have directed my especial, and almost exclusive attention, to an investigation of the nature and medical applicability of mineral waters. During the greater part of this time, I have resided at the White Sulphur Springs, where, in the capacity of resident physician of that extensive watering place, I have enjoyed ample opportunities for witnessing the various and modified effects of the water, in almost every variety of disease, and state of the system.

Although my attention, during this time has been especially directed to the investigation of the cha-

racter of the water of the White Sulphur, I have not neglected the other valuable waters of the great "spring region;" or failed to mark and appreciate their various peculiarities—and relative, and positive merits.

The main design of the present volume, is to bring the waters of the White Sulphur Springs, as a therapeutical agent, in a condensed view before the public—to state what is known of their applicability to disease,—and lay down some general rules for their administration:—And at the same time to present such an account of the neighbouring *Springs*, as to enable the public to understand something of their general character, and to appreciate their merits. They are all valuable—and have their peculiar applicability,—all rich in objects of special inquiry, and are well deserving the attention of the profession, and the public generally. To have gone into a more particular account of the springs, however, would have swelled this volume far beyond its intended limits:—Besides, while long observation has made me some-

what familiar with the nature and peculiarities of the White Sulphur Water, I know far less of the *peculiarities* of the other springs, and do not wish to *seem* to teach that which I do not myself understand.

The position of the writer, while it has enabled him to witness the virtues of the White Sulphur Water in disease,—has, at the same time enabled him to see that its good effects are not only often lost, but, that consequences highly injurious, sometimes result from its injudicious use.

Impressed with the importance of arresting the abuse of this potent agent, I published in 1839 “*A Directory for the use of the White Sulphur Waters.*” It is with reluctance I then undertook this pioneer effort in a field so entirely unexplored: for it is remarkable,—that although thousands of invalids, had for more than half a century annually resorted to these waters, that up to the period of issuing the “*Directory,*” not a line had ever been published, relative to their medical applicability and mode of administering them.

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Being satisfied, from the experience of the last seven years, that the little *effort* alluded to, has not been without its effects in guiding to a more prudent use of the waters, I have thought that a work on the same general plan, but more comprehensive in its scope, and more specific in its instruction, might be useful and acceptable to the spring going public.

So little has been written in reference to our valuable mineral waters, that it seems to be the duty of every one who may have had any experience with them, to contribute his mite. No other motives than a desire to offer to the public, the little that experience has taught me in reference to them, induces me to publish this volume. I regret that incessant engagements, claiming my entire time, have prevented me from bestowing that care in its composition and arrangement, so necessary to one who is utterly unpractised and unskilled as an author. The work, such as it is, has been composed in the fractions of time that I could snatch from professional engagements and agricul-

tural cares. With this apology for the many imperfections in style and arrangement, which will be discovered, I submit the volume to an indulgent and generous public.

JOHN J. MOORMAN.

FANCY HILL, VA.,

November, 1846.

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CHAPTER I.

MINERAL WATERS IN GENERAL.

Early Use of, &c. &c.—Mineral waters rank among the ancient remedies used for the cure of disease. The Greeks, who in knowledge of medicine were superior to the nations who had preceded them, regarded natural medicated waters as a special boon of the Deity, and piously dedicated them to Hercules, the god of strength. They used them for drinking, and for general and topical bathing. Hippocrates was acquainted with the value and uses of various mineral waters, and many other Greek physicians, we are told, employed them for numerous diseases for which they are used at this day.

With the Romans, mineral waters were a familiar remedy, not only in Italy, but in all the countries in which that nation obtained dominion. Mineral springs were eagerly sought out in the countries over

which their conquests from time to time extended, and prompted by "gratitude to the benefit which they experienced from their use, they decorated them with edifices, and each fount was placed under the protection of a tutelary deity."—(*Bell.*) Pliny, in his natural history, treats of various mineral waters and their uses; and it is a fact worthy of remark, that they were highly recommended by various Roman physicians, in the fifth century, in the same diseases for which they are at this day so much employed—particularly for nervous and rheumatic diseases, and for derangements of the liver, stomach and skin.

With the modern nations of civilized Europe, mineral waters, both as internal and external remedies, have always been held in high estimation. The national regulations that have, from time to time, been adopted to investigate their virtues, and their appropriate applicability, and to guard against their improper use, sufficiently manifest the importance that has been attached to them as remedial agents. Henry IV., we are told, "during his youth, had frequented the springs of the Pyrenees, and witnessing the abuses in the employment of so useful a remedy, sought to correct them after his ascension to the throne of France. He nominated by edicts and letters patent, in 1603, superintendents and superintendent

generals, who were charged with the entire control over the use of mineral waters, baths and fountains of the kingdom. Most of the mineral springs and bathing establishments on the Continent of Europe, are placed under a somewhat similar superintendence, and a resident physician is also appointed by the government.”—(*Bell.*)

Although mineral waters had been favourite remedial agents with the enlightened nations of the earth for many centuries, it was comparatively but recently that chemistry, by minute analysis, was able to determine with precision their constituent parts.

In 1670 the mineral waters of France were first fully analyzed by a commission appointed by the Academy of Sciences at Paris; but it was not until 1766, near a hundred years afterwards, that Bayen discovered the means of separating sulphur from sulphureous waters—nor until 1774 that the celebrated Borgamann demonstrated the existence of sulphuretted hydrogen gas. Meanwhile physicians stationed at the several watering places were active in observing and noting the various operations of the different waters on the human system, and in determining, from experience, the various cases in which they were beneficial or injurious.

Experience the only sure Guide in the Administration, &c.—After all that science can effect in determining the component parts of mineral waters, it is *experience* alone in their use, that can be fully relied upon as to their specific effects, or applicability to particular diseases. Chemical analysis is important mainly as a matter of general scientific knowledge, and may be so far practically useful to the physician, as to enable him to form correct *general views* as relates to the nature and powers of the remedy; but it is fallacious to suppose that an analysis, however perfect, can ever enable the physician, in the present state of our knowledge, and in the *absence of practical observation*, to prescribe a mineral water with confidence or safety. An accurate knowledge of the component parts of mineral waters, might do much, I admit, to prevent the incessant mistakes and mischief which medical men commit in sending their patients, "*hap hazard*," to drink mineral waters which are often unadapted to their cases; but it never can, in the absence of experimental knowledge, qualify them for giving specific and detailed directions for their use. Dr. John Bell, in his valuable work on "*Baths and Mineral Waters*," has the following sensible and judicious passage upon this subject. "I wish not," he says, "to be ranked among the chemical physi-

cians, who, having discovered the proportion of each foreign ingredient in the mineral spring, and studied its operation on the economy, pretend to determine the general effect of the compound. We may, indeed, by a knowledge of the constituent parts, predict to a certain extent, the medicinal power of the compound; but it is only by multiplied facts, that is, *experience of its use*, that we can speak positively of its virtues."

In no other country, perhaps, do mineral waters abound in greater variety than in the United States, and it is a subject of sincere regret, that their nature, applicability, and proper method of administration, should have been so little studied, both by physicians and the public at large. It is true that certain opinions generally prevail in enlightened circles, as regards the curative powers of some of our more celebrated fountains; and these opinions, so far as they go, being generally founded on experience, may, in the main, be tolerably correct. Nevertheless there is a lamentable want of information generally, and even among our more enlightened physicians, as to the *specific nature and adaptation of our mineral waters to particular diseases*—information, the want of which must always disqualify for the safe and confident recommendation of these valuable agents.

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of the peculiar minute circumstances that control the use of mineral waters in different systems, as well as the best methods of using them in certain pathological conditions of the system, must, as with all other medicines, be learned from observation. Now as physicians but rarely have an opportunity of observing the use of mineral waters for a sufficient length of time and in a sufficient variety of cases, and as but little has been written by those who have observed their effects, it ought not to be supposed that the medical public generally would be greatly enlightened on this subject.

I have said that the opinions generally prevailing in enlightened circles, relative to the curative powers of our principal mineral fountains, being founded on experience, may, in the main, be correct. I would not be understood, however, as advising a reliance upon such "popular fame." Information of this kind is sufficient to awaken attention and incite inquiry, but certainly should not be implicitly relied upon in individual cases. At best, it is generally "hearsay" opinion, made up, ordinarily, from partial and empirical sources; or, quite as likely, from the prejudiced accounts which are brought by visitors from the different watering places, and which are *sweepingly* favourable, or prejudicial, as they may chance to have been

benefited or worsted, and that without reference to the specific action of the agent, or that clear understanding of the pathology of the case, which would serve as a safe guide in its application to others. Every physician knows how prone persons are to err in the use of medicines, from the supposed resemblance of cases. Often am I pained to see persons persevering in the use of a mineral water to their evident prejudice, and for no better reason than that Mr. or Mrs. Such-a-one was cured of a disease supposed to be similar; or, by the general recommendation of some medical man who sent them to the "mountains" with a "*carte blanche*," to use "*some of the mineral waters*." Occasionally it has become my painful duty to advise patients to retrace their melancholy steps homeward, without using any of the waters, because none were adapted to their case.

Mineral waters are not a *panacea*; they act like all other medicines by producing certain *effects* upon the animal economy, and upon principles capable of being clearly defined. It follows, that there are various diseases and states of the system to which they are not only not adapted, but in which they would be eminently injurious.

Some years since, I was requested to visit a highly respectable gentleman, who had just arrived at the

White Sulphur with his family, from one of our distant cities. He was in wretched health, and sought my advice as to the applicability of the water to his case. On examination, I felt astonished that any medical man of intelligence should have recommended such a case to mineral waters for relief. I advised the gentleman to re-trace his steps homeward, and put himself under medical treatment, as he had no time to lose. Accordingly, the ensuing morning, he recommenced his journey of seven hundred miles to reach his home. Medicine did for him what mineral waters were not calculated to do, and I have since heard of his entire recovery. This gentleman informed me that he had been influenced to undertake the distant, and, to him, painful journey, by a physician who had never before prescribed for his case, and who candidly stated to him that he knew but little of the mineral waters of Virginia; but had heard of many cures from their use, and therefore advised that he should hasten to give them a trial. Influenced by this medical opinion, the unfortunate invalid had dragged himself and his family seven hundred miles, under the vain hope of finding a remedy, which the physician should, in such a case, have found in his own office. Now a little more knowledge of the nature of our mineral waters, and a more commendable

caution in advising their use, would have prevented the heavy sacrifice this gentleman incurred. Nor is this by any means an isolated instance—my case-book furnishes me with many others equally strong, that have come under my observation within the last few years.

Medical Efficacy, &c.—Mineral waters are exceedingly valuable as medicinal agents; are applicable to a large circle of cases; and will, unquestionably, cure many which the ordinary remedies of the shops will not. Nevertheless, it should always be borne in mind that they are not a *catholicon*; that they are not to be used for every disease; and that to be prescribed successfully, they must, like all other medicines, be prescribed with reference to the nature and pathology of the case. Nor is this caution ordinarily more necessary in using the various medicines of the shops than in using our more potent mineral waters.

Some there are, I know, who profess to be unbelievers in the medicinal activity of mineral waters, and who, without denying the benefit that is often derived from visiting such fountains, attribute the whole to travel, change of air, exercise, relaxation from business, &c. &c. Now I freely admit that these are often important agents in the cure of a large

class of cases ; but from long experience at a popular watering place, and the numerous cures I have seen effected from the water itself, totally disconnected with any of the adjuncts alluded to, it would be quite as easy to convince me that *bark* is not tonic, that jalap does not purge, or that mercury will not salivate, as that mineral waters may not be an active and potent means of curing disease, entirely independent of the valuable adjuvants that have been alluded to.

The advocates of the non-efficacy of mineral waters *per se*, would scarcely persist in this opinion, after seeing the large amount of active medical material, obtained by evaporation from some of our more active waters ; the *white sulphur*, for instance, which yields more than 150 grains to the gallon, and which, upon analysis, is found to consist of *iodine sulphur*, the various combinations of *soda*, *magnesia*, and other active ingredients. Would it not be absurd to believe, that so large amount of these efficient medical substances, as is usually taken into the stomach, by those who drink mineral waters in which they abound, could fail to exert a *positive influence* upon the economy ? My own experience, for many years, in the use of such waters, enables me to bear the most unequivocal testimony, as to the *direct* and positive

influence of many of them upon the human body. In the language of the celebrated Patissier, I can unhesitatingly say, that "in the general, mineral waters revive the languishing circulation; give a new direction to the vital energies, re-establish the perspiratory action of the skin, bring back to their physiological type the vitiated or suppressed secretions, provoke salutary evacuations, either by urine, or stool, or by transpiration; they bring about in the animal economy an intimate transmutation—a *profound change*; they saturate the sick body. How many sick persons, abandoned by their physicians, have found health at mineral springs? How many individuals, exhausted by violent disease, have recovered, by a journey to mineral waters, their tone, mobility and energy, to restore which, attempts in other ways might have been made with less certitude of success." And hence, most cordially do I adopt the sentiments of the distinguished Dr. Armstrong, who in speaking of the medicinal efficacy of mineral waters, says, "*I dare pledge my word, that, if they be only fully and fairly tried, they will be found amongst the most powerful agents which have ever been brought to the relief of human maladies.*"

Modus Operandi, &c.—Various attempts have been

made to account for the peculiar effects of mineral waters upon the system. They seem to act, in the first place, as a simple hygienic agent. Secondly, they act, in accordance with their constituent ingredients, specifically on the animal economy. Mineral waters exert their more important influences upon the human body upon a different principle from many of the articles of the *materia medica*; they are evidently absorbed, enter into the circulation, and change the consistence, as well as the composition of the fluids; they course through the system, and apply the medicinal materials which they hold in solution, in the most minute form of subdivision that can be conceived of, to the diseased surfaces and tissues; they reach and search the most minute ramifications of the capillaries, and remove the morbid condition of those vessels, which are so commonly the primary seats of disease. It is thus that they relieve chronic disordered action, and impart natural energy and elasticity to vessels that have been distended either by inflammation or congestion—while they communicate an energy to the muscular fibre and to the animal tissues generally, which is not witnessed from the administration of ordinary remedies.

Many of the articles of the *materia medica* seem to act by sympathy and counter-irritation, and to cure one

organ of the body by irritating another ; thus calomel, by irritating the stomach and duodenum, is made to act efficiently upon the liver, to which organ it has a strong specific tendency. Not so, however, with mineral waters ; they never cure one organ by irritating another. I can with confidence assert, that I have never seen mineral waters successfully used in any case in which they kept up a considerable irritation upon any of the organs of the body.

Both physicians and patients are quite too much in the habit of looking to the *immediate* and *sensible operations* of mineral waters, and of judging of their efficacy from such effects. In most cases, it is serviceable for such agents to open the bowels gently ; and in some, it is best for them to purge actively. Occasionally, advantage is derived from promoting an increased flow of urine or perspiration ; but, as a general rule, the greatest good is derived from the absorption of the water, resulting in that "profound change" spoken of by Patissier, or, in other words, the *alterative* action of the remedy. It should always be borne in mind that this *profound change*—this *alterative effect*—is incompatible with constant or active action of the water upon any of the emunctories. This, unquestionably, is true as relates to the *White Sul-*

phur Water, with which I am most familiar, and I believe it to be so with all alterative waters.

So well convinced am I, that the *alterative action* is the real curative action effected by *sulphur waters*, in nine cases out of ten where any serious disease exists, that, ordinarily, I am not solicitous to obtain much daily increase of evacuation from any of the emunctories. On the contrary, I often find great advantage from the administration of some appropriate means to *prevent* the too free action of the water, especially on the bowels and kidneys. As a general rule, it is far better that such waters should *lie quietly upon the system*, without manifesting much excitement upon any of the organs, and producing, at most, but a small increase in the quantity of the ordinary healthy evacuations.

The *quality* or kind of evacuations produced by mineral waters, is a matter of far more importance, and when strong sulphur waters are used, never fail to evidence the existence and the extent to which alterative action is going on in the system, and to this, persons using such waters, should always pay a careful attention.

I have said that the best effects of mineral waters, are their *alterative* or *changing* effects; and that in the administration of the White Sulphur Water, I do

not, ordinarily, desire to provoke much increase of the natural evacuations. I do not wish, however, to be understood by this general declaration, as laying down an absolute rule of practice to govern all cases. The administration of this water, like the administration of every other active remedy, should be governed in reference to the particular character and demands of each case; and in such discriminating practice, it will sometimes be found best to use it in a manner to produce active operations for a short time. I have, indeed, generally found, that those who are actively purged by mineral waters, if they have strength to bear it, will be best satisfied with the remedy *at the time*, and in fact, are apt to feel better *at the time*, than those upon whom the water is exerting but little or no purgative effect. It may be laid down as a general fact, in the use of the *White Sulphur Water*, subject to but few exceptions, that those on whose bowels it acts freely, will feel best *while at the Springs*; while those who are but little purged, will feel best after they have *left the Springs*, and will, ordinarily, enjoy the most permanent advantage. The reason of this is obvious; in the first case, the active purgation throws off the gross humours of the body, and the patient feels promptly relieved; in the other case, the remedy lies upon the system, is absorbed, and gradually produces its

changing influences—bringing the various secretory functions into a healthy condition—unloading and cleansing the machinery of the economy—silently putting its *works* to rights, and giving them their natural and healthy motion. All this requires time for its accomplishment; and hence, we often hear persons say, “I was no better while at the Springs, but I began to mend soon after I left, and have continued better since.” Declarations of this kind I hear every day by persons who have previously visited the Springs, and they verify the correctness of my proposition.

Length of Time to be used, &c.—To acute diseases, mineral waters are not adapted; for all such, they are too exciting, too prone to increase the activity of the circulation, and to stimulate the general system. It is in *chronic* diseases only that they are found so eminently serviceable. By chronic diseases I mean those slow diseases of the system, uniformly attended either with *simple excitement*, *chronic inflammation*, or *chronic congestion* of the blood-vessels. To be permanently beneficial in diseases of this description, the use of mineral waters, like the disease for which they are taken, should be “chronic;” I mean an instantaneous cure should not be expected, but that the reme-

dy should be persisted in, and the cure gradually brought about. Sulphur waters may be easily brought into disrepute by short and imperfect trials of them. To prove effectual, "they should for the most part be continued daily, in sufficient quantity, until the disease gives way, or until their inefficacy has been fairly proved by an unremitted perseverance. In some cases of ophthalmia, of rheumatism, and slight cutaneous affections, I have known them to effect a cure in two or three weeks, while in other cases, apparently similar in all respects, twice, thrice, or even four times that period has elapsed before the cure had been accomplished; and what is here affirmed of these external affections, is still more strongly applicable to internal diseases, which are seldom speedily overcome by these waters, how completely soever they may yield at last. In illustration of this point as to internal diseases, it may be mentioned that I have seen both chronic inflammation of the liver, and chronic inflammation of the rectum, where no benefit was produced for three or four weeks, and yet a *continuation* of the waters for six or eight weeks longer has effaced every vestige of the morbid indications for which they were prescribed."—(*Armstrong on Sulphur Waters.*)

There is no greater folly in the use of mineral waters, than that of laying down a *definite period of time for*

which they should be used, without reference to their effects upon the system. Like all other medicines, mineral waters should be used, discontinued, or modified in their use, with a strict regard to their operations upon the body, and to their good or bad effects upon the disease. Whenever prescribed, their operations should be watched with the same care with which we watch the effects of any other medicine; and they should be persevered in, or temporarily, or permanently discontinued, or, controlled in their action by some appropriate adjuvant, according to the indications presented in each case.

It will occur to every reflecting mind, that the expectation of being cured, or even essentially benefited, in an *obstinate chronic disease*, from a few days' use of any mineral water, is altogether unreasonable. Nevertheless, I have often seen persons at watering places despairing of the efficacy of the water, simply because it had not produced an obvious and appreciable benefit in five or six days. A sort of *stereotyped* opinion indeed prevails with numerous visitors to such places, that the water should not in any case be used longer than two weeks. I scarcely need say that this is a most erroneous opinion, and often interposes between the patient and his recovery; instances of which I almost daily see at the White Sulphur. It is

true, that some who hold the unwarrantable opinion alluded to, perseveringly endeavour to drink as much in the "two weeks," as they should do in six, but this only serves in a common way, to make them abandon it four or five days before their prescribed time, by absolutely disqualifying the system for its reception at all.

I can say, as the result of many years' observation, that the *White Sulphur*, which is one of the strongest sulphur waters in the world, rarely produces its full *alterative* effects within two weeks, under its most judicious administration, and under favourable circumstances for its use; and that three, four, five and even eight weeks often elapse before it has displayed its full remedial powers in obstinate cases.

General Remarks on the Administration, &c. &c.—Mineral waters are all *stimulants* in a greater or less degree, and some have attributed much of their virtue to this property. Such an opinion, however, is clearly erroneous. I have already remarked that such waters are rarely serviceable when they keep up any considerable irritation of an organ. I now remark that any considerable excitement of the general orgasm, is equally prejudicial: indeed I have often been embarrassed, and sometimes thwarted in the successful use of mineral waters, from the prevalence of this

quality. The amount of excitement resulting from the use of such waters, depends upon the nature of their constituent principles; upon the quantity taken, the manner of taking it, and the excitability of each individual's constitution. If it be a water abounding in sulphuretted hydrogen gas, the most essential difference exists in taking it *with or without its gas*; that is, in taking it fresh at the spring, or, after its gas has flown off. In the use of the *White Sulphur Water*, with or without its gas, the most marked difference exists in its stimulating quality. In relation to this particular water, it is greatly advantageous in many cases, particularly in very excitable persons, to have the gas expelled in part, or in whole, before using it.

Some mineral waters, by varying the method of their administration, or, by the interposition of appropriate adjuvants, are capable of extensive and valuable modified actions and effects upon the human body. The *White Sulphur* is susceptible of as many varied, different, and modified actions upon the system generally, and upon its particular organs, by varying the methods of using it as is mercury, or antimony, or any of our leading therapeutical agents. For instance, it can be so used as to *stimulate* distressingly—or, without any *appreciable stimulating effect*. It can be so given as almost invariably to *purge actively*;

or, without lessening the quantity producing such effect, but merely by changing the time and manner of taking it, it can be so given as to exert little or no cathartic operation. It may be directed to, or restrained from the *kidneys*, or skin; and what, in a general way, is far more important, it can be so used as to *lie quietly* on the system, producing no excessive action upon any of the organs, and, with a quiet but sure progress, go on breaking up the obstructions in the glandular organs and removing the impediments to the proper discharge of their functions: equalizing the circulation, removing chronic inflammations, and generally restoring the energies of the system.

Between the action of mercury and the more powerful of the sulphur waters on the organic system, the most striking similarity exists. Dr. Armstrong long since remarked the resemblance between mercury and the sulphur waters of Europe, and confidently expressed the opinion that the latter are equally as powerful as the former, in their action upon the secretory organs; and with this very important difference, but while the long-continued use of mercury in chronic disease, generally breaks up the strength, that of the sulphur waters generally renovates the whole system. Mercury has heretofore, by common consent, been regarded as the most powerful alterative we possess.

I am not prepared to dispute this high claim of the medicine, but this much I will assert, as a matter of professional experience, that sulphur water, in my hands, has proved an *alterative* quite as certain in its effects as mercury, though somewhat slower in its operations. Not only so, I believe it to be far better adapted than mercury to a large circle of cases in which glandular obstructions and chronic inflammations are to be subdued. If the claims of the two remedies for preference, were otherwise near equal, the great advantage on the score of safety from the sulphur water, would give it an immense preference over its rival. Numerous cases present themselves, however, in which they are used in conjunction to great advantage; where this becomes necessary, however, I have, as a general rule of practice, found it best not to continue the mercury longer than six or eight days; nor is it often necessary to use it continually during that period.

The effects of the *White Sulphur Water* upon the human body resemble mercury in several respects. Not to mention others, its resemblance is strikingly manifest from the fact of its producing salivation under certain peculiar circumstances. Another marked similarity may be mentioned, especially as it has a direct bearing upon the proper method of its adminis-

tration: I allude to the existence of a phlogistic diathesis in individuals with whom either remedy is used. "When the system resists the specific action of mercury, it is a certain test that the inflammatory diathesis prevails to a considerable extent, and this is the cause of the resistance; for lessen the inflammatory diathesis by proper evacuations, and the specific action of the mercury will be readily induced." The system often offers the same resistance to the successful use of this water, which is evidently occasioned by the excess of the inflammatory diathesis, inasmuch as when the inflammatory disposition is abated by the lancet, purgatives, &c., the water promptly produces its wonted good effects. In the administration of the White Sulphur it is of the utmost consequence to keep this practical fact constantly in view, and by proper treatment to keep down both general and local excitement.

"Notwithstanding mineral waters are so well adapted to the cure of chronic diseases, it should not be expected that they will be uniformly successful; for it must be remembered that such diseases are only remediable when unconnected with alterations of organic tissue, which is their ultimate and mortal product. Nor is it reasonable to expect that any plan of treatment will succeed in all cases of chronic disease

unconnected with alteration of tissue; and I have accordingly found the methods recommended, at times ineffectual, even when they were tried under circumstances which simply indicated disorder of the function, without any concomitant sign of disorganization."

Errors and Abuse of Mineral Waters, &c. &c.—I have before alluded to some of the abuses of mineral waters, by those who resort to them for relief—this subject, I conceive, may be still further pursued with profit to my readers. To one familiar with the many errors and mistakes committed in the use of mineral waters in this country, it is not wonderful that numbers return from visiting our most celebrated watering places, without having received any essential benefit; it is rather a matter of surprise that so large an amount of good is achieved. The precautions in the use of such waters, deemed indispensable in France, Germany and England, are greatly neglected here. There, the advice of a competent physician who is well acquainted with the nature and peculiarities of the water, is thought so important, that persons rarely enter upon their use without such *advice*, and at some places are actually not *permitted* to do so. If similar precautions were more commonly adopted by visitors

at our various watering places, a far larger amount of good would be achieved to the afflicted, much injury prevented, and the character of the several waters better established and preserved. It is a subject of daily and painful observation at all of our principal watering places, to witness numerous individuals using mineral waters that are not adapted to their cases; and still more common is it to see those, to whose cases they are adapted, using them so improperly as entirely to prevent the good they would accomplish under a proper administration. Professor Mutter, of Philadelphia, makes the following judicious remarks when speaking of the use and abuse of mineral waters in this country. "Like every other remedy of any efficacy, mineral waters are liable to abuse, and it is really astonishing that such glaring errors should be daily committed, not only by the patients, but often by the *physicians* who recommend their employment. It is by no means an uncommon occurrence (and those who have visited the springs of our country, will bear me out in the statement I am about to make,) for an individual to arrive, furnished with a 'carte blanche,' from a physician who has probably little or no knowledge of the active properties of the agent he recommends, to use the water as he may see fit, or with merely a charge to '*use it with caution.*'

Others are sent without any direction whatever, in the hope that the water *may suit* their condition, and come trusting in Providence alone. Others, again, arrive with written instructions, to drink so many glasses of the water *per diem*, whether it agrees with them or not. Many patients do not take the advice of a physician at all, but relying on the representations of those who have derived benefit, imagine that they, too, will be cured, although in all probability, from the nature of their disease, the water may be the most prejudicial to which they could resort. Used in this careless and dangerous manner, is it to be wondered at, that so many individuals leave the springs, either not at all benefited, or in a worse condition than when they arrived. The regulations which are thought necessary, and which are adopted in most European countries, especially France and Germany, during the use of a mineral water, are either unknown or neglected in this. There, nearly every spring is supplied with an experienced physician, one familiar with the character of the water, whose duty it is to take charge of the sick as they arrive; here, with but one or two exceptions, those who frequent our watering places have to rely on *chance* for medical aid. Is this as it should be?"

A vague impression seems to pervade the public

mind, that mineral waters, as medicinal agents, are totally unlike all other medicines, and that in their administration there is no necessity for observing any cautions or for adopting extraneous expedients to procure the best effects of the agent employed. This is an error as injurious as it is common, and ought to be corrected in the public mind. Our more potent mineral waters ought indeed to be regularly incorporated into our materia medica, their several qualities properly defined, and the medical mind thus instructed to regard them not only as valuable therapeutical agents, *per se*, but as agents capable of extensive and valuable modifications in their application to disease. A *pathological practice* should be established in relation to them, not less strict than in relation to the ordinary remedies of the shops, and the best means of influencing their sanative operations on the system understood.

The physician who desires to throw his patient under the *alterative* influence of mercury, is not so discouraged as to abandon the remedy, if it chance at first to run off by the bowels, and thus thwart his object; but either by changing the method of using his medicine, or by uniting with it some soothing astringent, he ultimately effects the important object in view. Neither should the physician be discouraged

in the use of a mineral water because it occasionally manifests a vagrant and improper effect, for facilities can be commanded to control its operations as readily as we can control the improper operations of mercury. Such facilities may generally be found, either in an *increase* or *diminution* of the quantity taken—an alteration of the *periods* at which it has been taken—or, in the manner of using it (where gases prevail,) in relation to its *gaseous* or *ungaseous* form. Occasionally, medical adjuvants are found necessary, and then I have been in the habit of using those most simple, and which least deranged the animal economy.

As a general rule, I have found mineral waters most serviceable in those cases in which the stomach and general system tolerated them readily; yet such toleration depends so much upon the proper *preparation of the system*, and the manner of using the water, that the patient should by no means infer that it is unsuited to his case, simply because it has manifested some improper operation in the commencement. For, as before intimated, it will often happen, that by changing the method of using the water, or by the administration of some appropriate adjuvant, the difficulty will all be removed, and the agent afterwards act most pleasantly and profitably upon the system.

CHAPTER II.

WHITE SULPHUR SPRINGS.

THE White Sulphur Springs are located in the county of Greenbrier, Virginia, on Howard's Creek, and on the immediate confines of the "Great Western Valley," being but six miles west of the Allegheny chain of mountains which separates the waters which flow into the Chesapeake Bay, from those which run into the Gulf of Mexico.

The waters of the spring find their way into Howard's Creek, two hundred yards from their source, which, after flowing five miles, empties into Greenbrier River.

The spring is situated on an elevated and beautifully picturesque valley, hemmed in by mountains on every side. *Kates Mountain*, celebrated as the theatre of the exploits of a chivalrous heroine in the days of Indian troubles, is in full view, and about two miles

to the south;—to the west, and distant from one to two miles, are the *Greenbrier Mountains*; while the towering *Allegheny* in all its grandeur of length and height, is found six miles to the north and east.

This spring is in the midst of the celebrated “spring region,” having the “Hot Spring” thirty-five miles to the north,—the “Sweet,” seventeen miles to the east—the “Salt” and “Red,” the one twenty-four, the other forty-one miles to the south—and the “Blue,” twenty-two miles to the west. Its latitude is about $37\frac{1}{2}^{\circ}$ north, and $3\frac{1}{2}^{\circ}$ west longitude from Washington. Its elevation above tide water is two thousand feet. It bursts with unusual boldness from rock-lined apertures, and is enclosed by marble casements five feet square and three and a half feet deep. Its *temperature* is 62° of Fahrenheit, and remains uniformly the same during the winter’s blasts and the summer’s heat; any apparent variation from this temperature will be found, I think, to have been occasioned by the difference in thermometers, as repeated trials with the same instrument prove the temperature to be uniform.

The principal spring yields about eighteen gallons per minute; and, it is a remarkable fact, that this quantity is not perceptibly increased or diminished during the longest spells of wet or dry weather; while other

bold springs of the country have failed during the long draughts of summer, this has invariably observed "the even tenor of its way." There is no discolouration of the water during long wet spells, or other evidences that it becomes blended with common water percolating through the earth. The quantity and temperature of this spring being uniform under all circumstances, gives a confidence, which experience in its use has verified, of its uniform strength and efficiency. The water is most clear and transparent, and deposits copiously, as it flows over a rough and uneven surface, a *white*, and sometimes, under peculiar circumstances, a *red* and black precipitate, composed in part of its saline ingredients. Its *taste* and *smell*, fresh at the spring, are that of all waters strongly impregnated with sulphuretted hydrogen gas. When removed from the spring, and kept in an open vessel for a sufficient length of time for this gas to escape, or, when it has been *heated* or frozen for this purpose, it becomes essentially *tasteless*, and *inodorous*, and could scarcely be distinguished either by smell or taste, from common limestone water. Its cathartic activity, however, is rather increased than diminished when thus insipid and inodorous.* It does not lose its transparency by part-

* See CHAPTER V.—On "*The relative virtues of the salina and gaseous contents of the white sulphur water.*"

ing with its gas, as many other waters do; nor does it deposit its salts in the slightest degree when quiescent—not even sufficiently to stain a glass vessel in which it may be kept.

The gas of this spring is speedily fatal to some animals, when immersed even for a very short time in its waters. Small fish thus circumstanced, survive but a few moments; first, manifesting entire derangements, with great distress, and uniformly die in less than three minutes.

There is but little in the early history of this celebrated watering place, especially worthy of preservation.

Tradition says that the charming valley in which it is situated, was once a favourite “hunting ground” of the proud *Shawanees*, who then owned and occupied this fair region, and the numerous ancient graves and rude implements of the chase, that are found in various parts of the valley, sufficiently attest the truth of this legend. That a small marsh, originally contiguous to the spring, was once a favourite deer and buffalo “lick,” is well known to the oldest white settlers in the country; and it is confidently asserted by some of that venerable class, that the spring was known to the Indians as a “*medicine water*,” and that since their migration across the Ohio, they have

occasionally been known to visit it for the relief of rheumatic affections. Whether this legend be truth or fiction, I cannot avouch; authentic history, however, abundantly testifies to the reluctance with which its ancient owners abandoned this lovely valley, to the rapacious avarice of the invading white man.

During the year of 1774, the proud, but ill fated Shawanees being overpowered by the encroaching colonists from Eastern Virginia, and having sustained, in October of that year, a signal defeat by the colonial troops, at Point Pleasant, were forced finally to abandon their country, and seek shelter and protection with the main body of their tribe, then living on the waters of the great Sciota; not, however, until by frequent battles and midnight murders, they had testified their attachment to their ancient hunting grounds and the graves of their fathers.

The property on which this spring is situated, was originally patented to — Carpenter, one of the earliest pioneers of the country, and who was subsequently killed by a band of marauding Indians, at the fort at the mouth of Dunlap's Creek, near where the town of Covington now stands. It is rather a remarkable fact, in a country like this, in which land is so prone to change owners, that this, as a whole, has never been

bought or sold, the present proprietor owning it by right of descent from the original patentee.

The precise time at which this spring, now so celebrated among mineral waters, was first used for the cure of disease, cannot be ascertained with absolute certainty. It is believed, however, that a Mrs. Anderson, the wife of one of the oldest settlers, was the first white person who tested its virtues as a medicine.

In 1778, this lady being grievously afflicted with rheumatism, was borne on a litter, from her residence, ten or fifteen miles, to the spring, where a tent was spread for her protection from the weather; and a "*bathing tub*" provided by felling, and excavating a huge tree that grew hard by. Here she remained until she had entirely recovered, drinking the water from the fountain, and bathing in the sulphur water previously heated in the trough by "hot rocks." It is reasonable to suppose that the fame of this cure spread abroad among the "settlers," and from them into Eastern Virginia, and among the few "spring going folks" who then annually visited the Sweet Springs, not many miles distant. Accordingly in 1779, and from that to 1783, there were annually a few visitors here, who spread their tents near the spring, no house having then been erected, and with the rude "trough" for a bathing tub,

and this protection from the weather, are reported to have spent their time most agreeably and profitably. Some of these primitive visitors, "who dwelt in tents," have visited the springs of late years, and with pleasurable emotions marked out the spot where their tents stood some sixty years ago, while they recounted with delight the amusements and pleasures they then enjoyed.

In 1784-5 and 6, numerous "log cabins" were erected, not where any of the present buildings stand, but immediately around the spring, not one of which, or the materials which composed them, is now remaining.

The present proprietor of this property came into possession of it in the year 1808, but did not personally undertake its improvement until the summer of 1818. Before this period, the buildings for the accommodation of visitors, although sufficient for the number that then resorted to the place, were exceedingly rude, being altogether small wooden huts. The interest and enterprize of the proprietor soon led him into a different and more appropriate system of improvement, and from small beginnings, he has gone on, progressing in the rapid ratio of demand, until from the "tent" accommodations in 1779, and the "log cabins" in 1784, the place now, both in ele-

gance and extent, exhibits the appearance of a neat and flourishing village, affording comfortable and convenient accommodations, (including the surrounding hotels,) for from twelve to fifteen hundred persons.

ANALYSIS.

In the winter of 1842, Mr. *Augustus A. Hayes*, of Massachusetts, made an analysis of the white sulphur water, at his laboratory, in Roxbury, from a few bottles of water forwarded to him from the spring the preceding fall. The following is a communication received from him on that subject:—

“This water is colourless and transparent, when agitated it sparkles from the disengagement of air bubbles. Taste, hepatic, resembling that of a solution of hydro-sulphuric acid in water. Exposed to the atmosphere, the hepatic odour is succeeded by a slight earthy odour. It blackens metals and salts of lead. Compared with pure water, free from air, its specific gravity is 1.00254.

“50.000 grains (about 7 pints) of this water contain, in solution, 3.633 water grain measures of gaseous matter, or about $\frac{1}{4}$ of its volume, consisting of—

Nitrogen gas	1.013
Oxygen gas	108
Carbonic acid	2.444
Hydro-sulphuric acid	68
	<hr/>
	3.633

“One gallon, or 237 cubic inches of the water contain $16\frac{7}{1000}$ cubic inches of gas, having the proportion of—

Nitrogen gas	4.680
Oxygen gas	498
Carbonic acid	11.290
Hydro-sulphuric acid,	271
	<hr/>
	16.739

50.000 grains of this water, contain $115\frac{7}{1000}$ grains of saline matter, consisting of—

Sulphate of lime	67.168
Sulphate of magnesia	30.364
Chloride of magnesium	859
Carbonate of lime	6.060
Organic matter (dried at 212° F.)	3.740
Carbonic acid	4.584
Silicates (silica 1.34, potash 18, soda 66, magnesia and a trace oxyd. iron)	2.960
	<hr/>
	115.735

“Unlike saline sulphuretted waters generally, this water contains a minute proportion of chlorine only, the sulphates of lime and magnesia forming nearly ten-elevenths of the saline matter.

“The alkaline basis are also in very small proportion, and seem to be united to the silicious earths, in combination with a peculiar organic matter. The organic matter, in its physical and chemical character, resembles that found in the water of the Red Sulphur Springs, and differs essentially from the organic matter of some thermal waters.

“In ascertaining its weight, it was rendered dry at the temperature of 212° F. When dry, it is a grayish-white, translucent solid. When recently separated from a fluid containing it, it appears as a thin jelly or mucilage, and gives to a large bulk of fluid a mucus-like appearance, with the property of frothing by agitation. It unites with metallic oxides and forms compounds both soluble and insoluble. In most cases an excess of base renders the compound insoluble. The compound with oxide of silver, is soluble in water; with baryta and lime it does not form a precipitate, while magnesia forms with it a hydrous white, gelatinous mass. In acids it dissolves, the oxy-acids do not change its composition, while they are diluted and cold, by boiling they produce sulphuric acid from

its constituent sulphur, and change its carbon to other forms. In contact with earthy sulphates at a moderate temperature, it produces hydro-sulphuric acid, *and to this source that acid contained in the water may be traced.* This substance does not rapidly attract oxygen from the atmosphere and from coloured compounds, as some other organic compounds do. The proportion of organic matter, like that usually contained in our waters, is in this water, very small, until forty-nine fiftieths of the bulk of a quantity is evaporated, the residual matter does not become coloured, and when the saline residue is dried, it is of a pale yellow.

“The medicinal properties of this water, are probably due to the action of this organic substance. The hydro-sulphuric acid resulting from its natural action, is one of the most active substances within the reach of physicians, *and there are chemical reasons for supposing that, after the water has reached the stomach, similar changes, accompanied by the product of hydro-sulphuric acid, takes place.**

“Substances, having characters similar to those presented by this matter, have been classed with the

* See Chapter V.—On “*The relative virtues of the saline and gaseous contents of the white sulphur water.*”

lower order of living plants. With such matters, this substance does not belong in the state in which it is found in the water, for it there forms compounds, the result of chemical affinities, wholly incompatible with vital action. In its altered state, produced by atmospheric agencies, it may nourish plants and develop the growth of seeds fitted to such a soil as its elements form.

“AUG. A. HAYES.

“*Roxbury Laboratory,*

“February 1st, 1842.”

Professor William B. Rogers of the University of Virginia, has also, in the course of his Geological Survey of the State, analyzed this water. The following is the result of his examinations:—

Solid matter procured by evaporation from 100 cubic inches of White Sulphur Water, weighed, after being dried at 212°,

65.54 grains.

Quantity of each solid ingredient in 100 cubic inches, estimated as perfectly free from water.

Sulphate of lime	-	-	-	31.680	grains.
Sulphate of magnesia	-	-	-	8.241	"
Sulphate of soda	-	-	-	4.050	"
Carbonate of lime	-	-	-	1.530	"
Carbonate of magnesia	-	-	-	0.506	"
Chloride of magnesium	-	-	-	0.071	"
Chloride of calcium	-	-	-	0.010	"
Chloride of sodium	-	-	-	0.226	"
Proto-sulphate of iron	-	-	-	0.069	"
Sulphate of alumine	-	-	-	0.012	"
Earthy phosphates	-	-	-	a trace	"
Azotized organic matter blended					
with a large proportion of sulphur, about					
	-	-	-	5	"
Iodine, combined with sodium or magnesium.					

Volume of each of the gases in a free state, contained in 100 cubic inches.*

Sulphuretted hydrogen	0.66 to 1.30	cub. inches.
Nitrogen	1.88	
Oxygen	0.19	
Carbonic acid	3.67	

* 100 cubic inches amounts to about 3½ pints.

CHAPTER III.

GENERAL DIRECTIONS FOR THE USE OF THE WHITE SULPHUR WATER.

Much that I might have said under this head, has been anticipated in the chapter on "Mineral Waters in general."

1. It is scarcely necessary to remark, after all that has heretofore been said of the necessity of using *mineral waters* with strict reference to the nature of the disease in which they are employed; and of the injurious consequences often arising from their careless or improper use; that it is not designed that the directions herein given, shall be considered sufficient to guide in the use of the white sulphur water in all cases; nor in any important case to the exclusion of the more minute and specific directions which each such case may demand. It is my intention, rather to indicate the ge-

neral rules, which, originally, must be observed in its administration, than to lay down definite directions which shall apply to all cases.

Every one who is familiar with the various types of disease; and with the peculiarities and radical difference in different constitutions and temperaments, modifying and influencing diseased action; will, at once be satisfied of the impossibility of laying down any *absolute* rule for the use of a potent medicine, that should be strictly adhered to in all cases. Each case, to a certain extent, must with this, as with all other medicinal agents, indicate the proper dose, and the proper manner of administration.

2. As has been already remarked, it is very common to attribute the beneficial effects of mineral waters, to their immediate *sensible* and *obvious* effects upon the human body. I have already shown this opinion to be erroneous:—that so far from it being true, that mineral waters uniformly manifest their beneficial effects by their *active operations*,—that such operations, frequently delay, or entirely prevent the good which they otherwise would have accomplished through the medium of their *alterative* effects.

Those who desire to obtain the *alterative* operations of the water, must, as a *general rule*, take it in

small quantities, and continue its use for such length of time, as will be sufficient, in common spring parlance, to "saturate the system." Patients thus using the water are apt, however, to become restless and dissatisfied for the first few days; so much so, that it is often difficult to reconcile them to this manner of administration; because, say they, "it is doing me no good:"—they wish to see such tokens of activity as are given by prompt and vigorous purgation. In a general way, I prefer that the water should act sufficiently on the bowels, even when given in reference to its alterative effects, to obviate the necessity of giving any other medicine for that purpose:—but it is often better to use some mild purgative from the shops, to effect this object for the first few days, than that the quantity of water should be greatly increased. This advice we know is very different from that generally given, and but too willingly pursued by those who receive it.

Comparatively but few strangers who visit the White Sulphur, are aware of the potency of its waters, and under the false impression that no harm will arise from any quantity that the stomach will bear, many are induced to use them in quantities, that not only defeat their sanative effects, but do much positive injury.

I have just remarked that it is often difficult to reconcile patients to the use of small and inoperative quantities of this water. Many such instances have come under my observation, and some, in which painful experience alone could control. A prominent instance of this kind, occurred in my practice several years since in the person of Mr. C. —. He was under treatment for a complicated stomach, and neuralgic affection, and had used the water twelve days in small doses with happy effect,—he was lodging at one of the adjoining hotels, and believing that he was doing well, I did not see him for two or three days; and then casually met with him. I was astonished to find him greatly changed for the worse. His appetite, before good, had almost entirely ceased; his system was irritable and feverish; could not sleep at night, and in every respect was sensibly worse;—had begun to despair, and proposed leaving for home, as he was “satisfied the water was not agreeing with him.” I accused him of impropriety in diet, or of other imprudencies, but he satisfied me that he had followed my directions in all “such things,”—but, that he had so far varied from my advice in the use of the water, as to take *sixteen* instead of *six* glasses daily for the last few days. I advised this gentleman, as I would all others who have committed a similar

“debauch” on cold water, to discontinue its use entirely for a time,—take some cooling opening medicines and then return to the use of it in rational doses. This plan was pursued by Mr. C. and with the happiest results.

The opinion is as common, as it is erroneous, among those who visit mineral waters, that they are to be benefitted in proportion to the quantity they drink. Persons in health, or not debilitated by disease, do sometimes indulge in enormously large and long continued potations of such waters with apparent impunity; but it by no means follows, that those whose stomachs are enervated by disease, and whose general health is much enfeebled, can indulge the habit with equal safety. In such stomachs, the effects of inordinate distension, are always painful and injurious, while the sudden diminution of the temperature, from large quantities of cold fluid suddenly thrown into the system, can scarcely fail to prove injurious.

We sometimes meet with another class of visitors, who err just as much on the opposite extreme;—they arrive at the springs, and place themselves under the government of a *recipe* for the use of the water, drawn up, most commonly, by some distant medical adviser, who has never himself had an opportunity of observing its effects, and such, we not unfrequently see

taking this *aqua medicinalis* in literally *broken doses*;— in quantities altogether insufficient to produce any sanative effect.

3. QUANTITY OF THE WATER TO BE USED.

The quantity of the water to be taken in the course of the day, depends, in a very great degree, upon the nature of the case and the peculiar condition of the system at the time of taking it. Comparatively but few invalids should use, *at first*, more than from four to eight glasses during the day;—in some instances, not more than two or three. In most cases these quantities may be gradually increased to ten or twelve glasses. In a general way, this should be considered the maximum quantity even for robust persons, though there are cases in which the amount may be still further enlarged.

4. PERIODS FOR THE USE OF THE WATER, &c.

The periods at which the water should be used is a matter of no little importance. A common practice at the springs is to drink it awhile before each meal,

morning, noon, and afternoon. In some cases this manner of using the water is to be preferred; in others, it is better that the whole that is taken in the course of the day, be divided into *two parts*, and taken, either in the morning before breakfast, and awhile before dinner; or, in the morning, and awhile before going to bed at night.

Advantage is very seldom secured from the water taken before supper, and often it is prejudicial from its proneness to run off by the kidneys. Observations lead me to believe that, as a general rule, the water taken *before breakfast*, and before *going to bed at night*, is most serviceable to a majority of invalids; though there are some who can not very well bear it at night, and attention should always be paid to this circumstance.

It should not be used immediately before or after a meal;—nor should glass after glass ordinarily be taken in *rapid succession*. By this reprehensible practice the stomach is often overtaken, and immediate unpleasant consequences result, such as *eructations*, *giddiness*, unpleasant *excitation* and a painful sense of fulness, and sometimes a permanent injury of the stomach with *atonic dyspepsia*. Such a course also disposes the water to run off hastily by the kidneys, an operation for which it has naturally a strong

tendency, and which often embarrasses in its administration.

Now and then advantage is derived from using the water at meals, and sometimes a *tolerance* is established for it in this way, which cannot be achieved by any other. In most cases, however, it is neither pleasant or profitable to the invalid to use it with his meals.

I cannot leave this branch of the subject without earnestly urging upon invalids the importance of strict attention as to the *manner* and *periods* of using the white sulphur water;—much, very much, of its curative power depends upon the use of proper quantities and upon the periods of administration. A series of comparative experiments with the water as to *times of using*,—*quantities used*, &c., &c., has fully satisfied me, that its influences on disease are as much modified by the different methods of using it as we find to be the case with mercury, or any other article in general use by the physician.

5. LENGTH OF TIME TO USE THE WATER.

The length of time the invalid should continue the use of this water, depends entirely upon the *nature of the case*,—the manner in which it has been used, and

the *susceptibilities of the system*. Most erroneous notions exist in a large portion of the public mind upon this subject. Many believe that it will exert all its good influences; or, as they say, will "saturate the system," in eight or ten days, others allow it two, three, and four weeks to effect the same object. Now the truth is, that the time, in which the ultimate good effects of the water are accomplished, always depends, as before remarked, upon circumstances;—upon the nature of the case,—the manner in which the water has been used, and upon the susceptibilities of the system. Some persons will be thrown as fully under its influence in two weeks as others will be in four; and yet it may be equally well adapted to each case. In every case of its administration, respect should rather be had to the *effects* it is producing, than to the time it has been used. It never cures disease until it has first produced certain *effects* upon the animal economy;—EFFECTS which can always be distinguished by the practiced observer during the progress of their operation, with the same certainty that we can distinguish the effects under the alterative operation of mercury.

It often happens that persons to whose cases the water is well adapted, use it assiduously for three or four weeks, without deriving a particle of permanent

benefit;—and all in consequence of so improperly using it, both in time and quantity, as to force it out of the system by the emunctories, without “touching the case,”—without being permitted to tarry long enough to produce any of those *salutary effects* which must precede a cure.

It cannot, therefore, be too earnestly urged upon those who are using the water for any obstinate disease, to have their attention fixed upon the *effects* which it is producing; or has produced; rather than upon a given number of days, in which they may have been taught to believe their systems would become changed or “saturated.”

Dr. Armstrong found that from *six to twelve weeks* were often required for Harrowgate and Dinsdale waters to produce their full curative effects; and we occasionally see similar time required for the development of the full sanative effects of this water. In some cases, however, where the system was previously well prepared, and the subsequent management judicious, the white sulphur water will produce its full *alterative* operations in about two weeks. Such cases, however, are rare, and it will generally be found, that from three to six weeks, or even longer, must elapse under its use, before those “*profound changes*” are wrought, which precede and ensure a return to health.

These remarks, as far as they relate to *time*, are applicable to all our mineral waters that cure disease in virtue of their *alterative* action, for if they be true as to the *Harrowgate*, admittedly one of the strongest sulphur waters in the world, and of the *white sulphur*, scarcely, if at all inferior in strength to that celebrated European spring, they cannot be less true of waters of the same class, but inferior in point of strength.

When sulphurous waters are prescribed, their operations should be narrowly watched, and if they produce untoward and unpleasant symptoms, such as headach, gastric distress, furred tongue, quick and irritable pulse, with costive bowels and loss of appetite, they should ordinarily be temporarily, or permanently discontinued, as circumstances may demand. The temporary discontinuance of the water under the circumstances just supposed, and the use of a brisk cathartic;—or the lancet, if the state of the blood-vessels demand it, will generally enable us to return to its use in a day or two with safety and success.

6. PREVIOUS PREPARATION FOR THE USE OF THE WATER.

Some preparation of the system preceding the use of the water, is often, though not always, necessary for its safe and advantageous administration. Most persons, after the excitement usual to the travel in visiting the springs, will be profited by taking some gentle purgative, and by the use of a light and cooling diet for a day or two before the water is freely used. Those in feeble health should always commence the use of the water with great caution, and generally in its *least stimulating form*, that is, after it has set in an open vessel until its gas has escaped. If, with these precautions, it fail to exert its desired effects, or produces unpleasant symptoms, the medical adviser, to whom it would be necessary to resort in such an emergency, would, of course, prescribe according to circumstances; nor can any general rule be given as respects the treatment that would be necessary in such a case; one patient often requiring treatment essentially different from another.

Invalids, however, ought not to despair of the use of the water, and of its adaptation to their cases, sim-

ply because it may, at first, or even in the progress of its use, display some vagrant and improper action upon the system. Errors in its action, if they may so be termed, generally arise from errors in its use, and may generally be prevented by a change in the method of administration, or, by some medical adjuvants, so that the water may be safely continued.

7. EFFECTS OF THE WATER ON THE SYSTEM.

The sensible medicinal effects of the water are prominently displayed in its action upon the *bowels, liver, kidneys, and skin*, and when drunk fresh at the fountain, by a lively *stimulant* effect upon the system in general, and upon the *brain* in particular.

Proper quantities, taken in the morning before breakfast, will rarely fail to exert some *cathartic* effect in the course of the day. The liver is, in most instances, brought under its influences, from a few days perseverance in the use of it, as will be manifest from the character of the excretions. Its action upon the *kidneys* is readily induced, and we not unfrequently see it exerting, at the same time, both a diuretic and cathartic operation. Occasionally the exhalent vessels of the skin are stimulated to increased *perspira-*

tion; but its full effects upon the surface, manifested not only by increased, but *sulphurous perspiration*, do not often occur until it has been freely used for several weeks, nor until the secretory system generally has been brought under its influence.

8. USE OF MEDICINES.

Advantage is often derived during the administration of this water, from the judicious use of appropriate medicinal adjuncts, whose tendency is to give to the water a specific direction upon the organs, or to restrain some untoward and improper action.

In most obstinate cases, in which it is desirable to procure the specific operations of the water on particular organs, much time, to say the least of it, is saved by uniting with the water for a few days, some adjunct that *specifically determines to such organs*. By such a procedure, the water may be *invited* to the organs and establish its action upon them much sooner than it would without such aid.

In diseases of the abdominal viscera, generally, the patient may often economise a week or more of the time which otherwise it would be necessary for him to use the water, by the proper introduction of some

medical adjunct to the end that has been intimated. The milder mercurials, in union with some of the vegetable purgatives, often answer exceedingly well in such cases, but generally it is not advisable to continue the use of the mercurials for many days with sulphur waters.

A most valuable aid in the use of this water, is the *tepid, warm, or hot sulphur bath*. We cannot here enter into particular directions for the use of such baths. We just observe, that they may be made a most important auxiliary in a large circle of cases, if timely and otherwise properly employed.

Hot sulphur bathing, indeed hot bathing of any kind, is a remedy potent and positive in its influences;—capable of effecting much good when judiciously employed, or corresponding evil when improperly used. Like potent mineral waters, it is often used empirically and improperly, and, hence, becomes a curse when it should have been a blessing. It is a remedy essentially revolutionary in its character,—never negative, but always producing positive results upon the economy for good or for evil.

The condition of the system indicates with sufficient clearness the time for commencing, and the temperature of the bath. In most cases, the *bathing point* is as clearly indicated under a course of sulphur waters.

as the blistering or bleeding point is in inflammations, and the value of the remedy is much dependant upon such timely employment. When the water has well opened the bowels, has found its way into the general circulation, softening the skin and calming the irritation of the arterial system, the sulphur baths may be used with great confidence in their efficacy.

Hot baths should never be taken during the existence of febrile excitement, they should be used on an empty stomach, and, as a general rule, before the decline of the day, and their temperature always carefully regulated to suit the nature of the case and the state of the system.

9. CHANGING FROM SPRING TO SPRING.

A very common error in the use of mineral waters, is the belief that the patient should often change from one water to another, and that no one should be used longer than some given number of days, and this without any reference to its effects upon the system. This absurd notion leads many persons to fly from spring to spring, performing in a few weeks or days the circuit of the whole "spring region," and without remaining long enough at any one to receive perma-

ment benefit. Now if the position heretofore laid down be correct, that "mineral waters, like all other medicines, cure disease by exerting *effects* upon the animal economy," the impropriety will be obvious to all, of rapidly hastening from one fountain to another, without tarrying long enough at any to receive those *effects* upon the body which are necessary to a cure. Such a water drinker acts like the "maid of all works," always busy, but accomplishing nothing.

What would be thought of the physician, who, having decided that his patient must undergo the influence of alterative action upon his system, and having put him upon a course of mercury to accomplish this object; should, just before this drug would have accomplished the end, discontinue its use, and put him upon iodine; and just as this was about to alterate the system, abandon it and substitute sarsaparilla;—and thus from one drug to another, remaining through the whole routine of alterative remedies, without giving one sufficient time to effect the object. This would surely be an absurd method of practice; and yet it would not be more absurd than the course we often see pursued by visitors at our springs,—who literally waste their whole time "in the mountains," and debar themselves of all permanent good, by spending their time rather *among* the springs, than at any one of them. The

state of mind which leads invalids thus improperly to act, is often induced from the random opinions, or injudicious advice of their fellow sufferers whom they meet with at the various watering places. One will tell another that they have seen, or heard of some person that was cured at once, at this, that, or the other spring. You will be assured by one, that the "White" is the place;—by another that the "Salt" is better suited to your case;—a third informs you that you would do better at the "Blue," while others will tell you there is nothing like the "Red," the "Sweet," the "Warm," the "Hot." Thus are the minds of persons frequently perplexed, until they come to the conclusion to "make the rounds" and try them all for a day or two. In this way the hapless invalid is often led to fritter away the whole time he remains in the mountains, without deriving permanent advantage from "*all the springs,*" when, very probably, the time he had fruitlessly spent at them all, would have been sufficient to have cured him at *any one of them.*

Let it be distinctly understood that these remarks are meant for the serious invalid only. Persons who visit the springs for amusement or pleasure; or those who come merely as a relaxation from business, and require only the tone which travel and mountain air can give, may, with great propriety, go from spring to

spring, and spend their time just where they are the happiest. But for the invalid *who has something for the waters to do*, it is not so;—he should first, wisely determine which of the springs is best calculated to cure his disease; and having settled this important question, should persevere in the use of that particular water; carefully watching its effects, and “not be carried about by every wind of doctrine.” If the appropriate agent for his cure be the “Blue,” the “Red,” the “Salt,” the “White,” let him use it to the exclusion of all others, either until its inapplicability has been proven, or until it produces the specific effects which he desires.

10. DRESS.

Delicate persons visiting the mountains for health, should be particularly cautious on the subject of dress. It is rather more easy to dress with the ever varying fashions, than to dress appropriately for *all the weather* that happens in our mountains during the “watering seasons.” The weather is often so variable and uncertain as to make it a good general rule for the invalid to dress without reference to any particular state of it, but always warm and comfortable, with, (in

most cases,) but little change from his dress in the spring season before he reached the mountains.

Some invalids will be benefited by constantly wearing soft flannel next the skin, not only because it keeps up a more uniform temperature than linen, but also because of the gentle excitement it occasions on the surface of the body. The best summer dress, however, which we have ever seen worn next the body;—and always a valuable accompaniment of flannel, winter and summer, is *woven silk*. We are led to believe from experience, that silk, worn next the skin, is the very best protection we can command against the influence of cold. In *rheumatism*, and *neuralgia*, a covering of woven silk is a valuable *remedy*; and for all delicate persons,—and for these peculiarly susceptible to colds, it is a most invaluable shield to the body. The superiority of silk over every other covering, is probably owing to its peculiarity as a non-conductor of electricity, but whether this be so or not, is left to the astute medical philosopher to determine; it is sufficient for us to know the fact of its superior efficacy without stopping to account for it.

11. DIET, EXERCISE, &c.

Diet and exercise during the use of mineral waters are of too much importance to be passed over without notice. It is to be regretted that so little as relates to diet, is placed within the power of the invalid at our watering places generally. Usually there is but one general system of living at all such places, and this invariably a system very illy adapted to the invalid.

Persons using the white sulphur water may, ordinarily, indulge in moderation, in that diet which they found to agree best with them at home. Imprudencies as to the kind of food, or of excess in its quantity, should be as carefully avoided by the invalid while using the water, as when under treatment by other medical means. This however is by no means commonly the case.

The use of the water generally removes acidity from the stomach and sharpens both the appetite and the digestion; hence it is often really difficult for the invalid to restrain himself at table, and we might be astonished to see the quantity and quality of food he sometimes consumes. Dyspeptics, as might be ex-

pected, suffer much from impropriety in diet: indeed we are persuaded that more than half the good this water would otherwise achieve in such cases, is prevented by impropriety in diet. But the evil of over and improper feeding, although, most manifest in dyspeptics, is by no means confined to such. Upon the subject of diet Dr. John Bell has well observed, that "slow and laborious digestion, heartburn, disordered kidneys, discolouration of the skin, and some affections of the liver, often the effects of excessive eating and drinking alone, are not to be readily cured by visiting mineral springs, and keeping up the same kind of living." If they, and the remark applies to all invalids, be sincerely desirous of gaining health, they will most successfully do so, by simplifying their regimen, and abstaining from all those appliances to force appetite and tickle the taste which they had formerly used in the shape of ardent spirits, wines, and malt liquors, fried meats, pastry, and unripe fruits. In fine, we may sum up in a few words, by repeating after the great father of medicine, that all excesses are dangerous; a maxim every one must have fully tested.

Eating much in the evening, sitting up late, prolonged and immoderate dancing, remaining too long in the cool air of the evening, are often the cause of

many unpleasant complaints, which might have been easily prevented.

The passions are to be kept in check by avoiding every exciting cause, either of the boisterous or melancholy kind: a giddy chase after pleasure and luxurious indulgence, are scarcely more reprehensible than an indolent and secluded life. The kind and amount of exercise to be indulged in by the patient, must of course be regulated by the nature of his disease and the attendant circumstances:—walking,—riding on horseback, or in a carriage, may be selected, as one or the other may be best adapted to the physical ability, and to the inclinations of the patient; but in some form or other, all whose strength will admit of it should take regular exercise in good weather.

CHAPTER IV.**DISEASES TO WHICH THE WHITE SULPHUR WATER IS
APPLICABLE.**

ALL mineral waters, as before remarked, are stimulants to a greater or less degree, and consequently are inapplicable to the treatment of acute, or highly inflammatory diseases. This remark is especially true as relates to the white sulphur, particularly when drunk fresh at the spring and abounding in its stimulating gas. It is true, as before shown, that when its exciting gas has flown off, it becomes far less stimulating, and may be used with safety and success in cases, to which in its perfectly fresh state, it would be totally unadapted. But even in its least stimulating form, it is inadmissible for excited or febrile conditions of the system; and especially to cases of inflammatory action;—at least, until the violence of such action has been subdued by other and appropriate agents.

It is to chronic affections of the organic system that the white sulphur water is peculiarly applicable.

Various diseases of the stomach, liver, spleen, kidneys, and bladder, as well as some derangements of the brain and nervous system generally, are treated successfully by this agent. To the various affections of the skin, unattended with active inflammation;—to chronic affections of the bowels,—and to gout and rheumatism it is well adapted. In hæmorrhoids;—in some of the chronic affections of the womb;—in chlorosis and other kindred female disorders, in mercurial sequæ, and especially in the secondary forms of lues, and ill-conditioned ulcers in depraved constitutions, it constitutes the most valuable agent to which the invalid can resort.

If the individual about to submit himself to the use of this water, is suffering from fullness and tension about the head, or pain with a sense of tightness in the chest or side; he should obtain relief from these symptoms before entering upon its use. If his tongue be white, or heavily coated; or if he be continuously or periodically feverish, or have that peculiar lassitude, with gastric distress, manifesting recent or acute biliary accumulations, he should avoid its use until, by proper medical treatment, his biliary organs are emulged, and his system prepared for its reception.

Much suffering, on the one hand, would be avoided, and a far larger amount of good, on the other, would be achieved, if visitors were perfectly aware of, and carefully mindful of these facts.

It is an every day occurrence during the watering season at the "White," for persons to seek medical advice, for the first time, after they have been using the water for days, perhaps, for weeks, and it is then sought because of vagrant operations, or injurious effects of the water. In most such cases, there will be found, upon examination, either the existence of some of the symptoms just mentioned, or evidences of *local inflammation* in some part of the body, sufficient to prevent the constitutional efficacy of the remedy. We are often struck with the control which an apparently inconsiderable local inflammation will exert in preventing the constitutional effects both of the mercurials and mineral waters. To remove such local determinations where they exist, or greatly to lessen their activity, is all important to secure the constitutional effects of sulphur water.

DYSPEPSIA.

In this common and annoying disease, consisting in derangement of function in the organs of digestion, the white sulphur water has long maintained a high character. In this affection, especially in its confirmed stage, we almost invariably find the biliary secretions either vitiated in quality or deficient in quantity; constituting an important, and not unfrequently, an embarrassing feature in its treatment: nor can we ordinarily succeed in effecting a cure, until the secretory functions of the liver are restored to a natural and healthy condition.

The beneficial effects of this water in *dyspepsia*, seem to result mainly from its sanative action upon the liver. To *alterate* the secretory functions of that organ, and establish a flow of healthy bile, is one of the great forts of the water, and almost an invariable result of its persevering use.

That the water benefits the stomach in many cases by a primary action,—first, as an alkali and stimulant, neutralizing its acidity, and imparting directly a tone and energy to the viscus—and, secondly, by a positive influence on its glandular structure, occasioning a

healthy flow of gastric juice, we do not doubt. Still the most decided and permanent benefits derived by dyspeptics, have always seemed to us, to be the result of full alterative impressions upon the liver. Certain it is, that without such an influence upon that organ, the dyspeptic can never be confident of the permanency of his relief. It would be well for sufferers under this distressing malady to bear this in mind, and not abandon the use of the water, as many do, until it has fully impressed the liver;—nor be discouraged at its apparent want of efficacy until it has been used sufficiently long to effect this object.

In the course of our observations, we have often alluded to the *alterative effects*, of sulphur water on the liver as affording a most important indication of this efficacy. It may be asked, how shall it be known when this alterative effect has taken place? we reply, you are to judge of this mainly by the character of the excretions,—and by all the indications by which you judge of the alterative effects of mercury upon the same organ.

Dyspeptics often grievously are in the use of the water, by mistaking its primary effects, which are generally transitory, for a permanent cure; and hence abandon it before its *permanent sanative* action has been obtained. Such patients not unfrequently, after

taking the water for a week or ten days, find that the acidity of the stomach has been relieved,—their appetite increased, and, that they are able to “eat every thing before them:”—This is all very well as far as it goes, and if their attack be recent and slight, this comfortable state of things may continue; but it will much oftener turn out to be merely the alkaline and stimulant influence of the water upon the coats of the stomach, imparting this generous tone to the viscus for a season, and which in all probability is destined to lure them into an excess of diet and other imprudencies, which will, ere long, develope to them the fact, that the monster was “scotched not killed.”

The importance of the subject urges us to repeat, that the *confirmed dyspeptic* cannot too forcibly impress upon his mind, the essential practical truth,—that the *alterative* influences of the water must be exerted upon his system before he can have assurance of permanent good from its use.

We cannot here stop to lay down particular directions for the administration of the water in dyspepsia, but premise, that as a general rule, it should be taken in *moderate* or small quantities, and with less or more of its gaseous contents, agreeably to the excitability of the system, and the amount of excitation which it may be desirable to produce.

Where the nervous system bears the fresh water with impunity, we prefer that the dyspeptic take it soon after it has been removed from the spring. With many, however, there is found too much excitability for the water perfectly fresh; such therefore should use it more or less stale as their system will bear it.

GASTRALGIA, or Nervous Dyspepsia, is a form of disease occasionally met with at our watering places, and is an affection often of difficult and uncertain management whatever be the remedies employed. When it is purely functional and disconnected with organic lesion, the white sulphur, administered in moderate quantities, and in its least stimulating form, is a safe, and sometimes an efficacious remedy. We usually prefer, however, to continue its use at first, no longer than may be necessary to bring the bowels and the secretory action of the liver under its influence, and then give the patient the advantage of the tonic influence of the waters of the Sweet, or Red Chalybeate, and their *champaigne* baths. Advantage is often derived by alternating during the season between the latter springs and the white, or some other sulphur water.

PYROSIS or Water Brash is another form of stomach

disease, in which this water is occasionally used, and sometimes with very good effects. Indeed it is rarely used in water brash without benefit. In this form of disease, the water should never be taken in large and often repeated draughts,—from such a course increased debility of the stomach with other deliterious consequences would rarely fail to follow.

When good reasons exist for supposing the stomach to be *schirrous* or *cancerous*, the patient should carefully abstain from the use of this, or any of our mineral waters. Two cases have come under our notice in which much injury was received from their use, one from the alum water, the other from this.

It is scarcely necessary to say to the intelligent reader, that dyspepsia is rarely cured whatever be the remedies used, without a careful attention to *diet*. By care in diet, we by no means wish to be understood, that the patient is to confine himself to the *stereotyped recipe* of “black tea and toast,” and other light slops: the tendency of which is rather to enervate than invigorate the stomach,—or, that in his mind’s eye, he is ever to be weighing or measuring the quantity of food he is to consummate each meal. It has rarely been our good fortune to see any one cured of confirmed dyspepsia, who had been long kept on the miserably attenuated debilitating slops, so often

recommended for such ; and especially one, who weighs, if not his appetite, at least his aptitude to eat by *avoirdu pois*. The fastidious particularity, *secundum artem*, in such cases, that is often witnessed, serves admirably to impress upon a mind disposed from the nature of the case to be distempered,—the appalling truth that mortal disease is ever threatening;—to induce low spirits and despondency, and to super-add new horrors to a disease of itself sufficiently horrible.

The diet in dyspepsia should always be appropriate to the wants and ability of the stomach. In a majority of cases, the dyspeptic will more readily digest the lighter meats than the vegetable matter, upon which they generally feed ; and in such case there is nothing more proper than light meats. Fresh eggs properly prepared may always be taken. Coarse rye bread is often the best diet of the kind. When wheat bread is used it should always be well lightened and stale. Bread of corn, popular as a diet in Virginia, is found to agree admirably with some dyspeptics. Milk as a general rule is not only harmless but useful. Vegetables whether dressed or undressed, in their simple state, or manufactured into pies, tarts, sweet-meats, &c. &c., must be repudiated. The same of soups, gravies, molten butter, &c. After all, however, there

is no one who can judge of diet of the dyspeptic like the dyspeptic himself. Let such carefully examine themselves, and especially the effects of different articles of diet upon their system, and they may without mistake settle down upon those that are most beneficial. The true and only secret upon this subject is, to eat nothing that disagrees, and any thing that does not.

2. DISEASES OF THE LIVER AND SPLEEN.

The white sulphur water acts specifically upon the secretory organs, and especially upon the liver.

We have already, in another part of this volume, shown the striking similarity of action between mercury and sulphur waters upon the animal economy. In nothing is this more manifest than in their operations on the liver.

The *modus operandi* of sulphur water upon this viscus, is dissimilar we conceive from that of mercury, and yet the effects of the two agents are strikingly analogous. The potent and controlling influences of the water over the secretory functions of the liver, must be regarded as a specific quality of the agent, and as constituting an important therapeutical feature in the value of the article for diseases of this organ. Its in-

fluence upon this gland, is gradually, but surely to unload it when engorged, and to stimulate it to a healthy exercise of its functions when torpid. The control which it may be made to exercise over the liver, in correcting and restoring its energies, is often as astonishing as it is gratifying,—establishing a copious flow of healthy bile and a consequent activity of the bowels,—imparting vigour to the whole digestive and assimilative functions, and consequently energy and strength to the body, and life and elasticity to the spirits.

Attention was directed at an early period in the history of mineral waters, to their controlling influence over diseases of the liver, and by the best informed practitioners both of Europe and this country, sulphur waters have always been favourite remedies in the treatment of that class of affections.

The celebrated Dr. Armstrong, although of cool discriminating and well balanced mind, was so much devoted to their use in chronic inflammations and congestions of the liver, that some of his cotemporaries, less practised in their use, thought him infatuated upon the subject. He preferred them, most decidedly, as an independent remedy, to mercury in all its forms; but very properly observes, that in some cases, it will be

found best to combine the operation of the two agents at the same time.

For many years we have kept a *case book* at the White Sulphur, and have carefully noted the influence of the water upon such diseases as have been submitted to our management. Among the number arise several hundred cases of chronic affections of the liver, embracing disease of *simple excitement*, chronic *inflammation*, *congestion*, *engorgement* and *obstruction* to the biliary ducts, &c., &c. These cases were all treated either with the white sulphur water alone, or aided by some other appropriate alterative remedy, and in looking at the results, we must be permitted to express a doubt whether a larger *relative amount* of amendments and cures have been effected by the usual resources to the medical shop. This we know is high eulogy of sulphur water in such diseases. It is considerably made, and is not higher than their merits deserve.

It is proper that those affected with liver disease, (and they constitute no small portion of the population, in certain districts of our south-western territory,) should know something of the confidence they may place in these waters for relief.

Volumes might be filled with details of gratifying results that have taken place in the cases of invalids,

from almost every section of the country, who visited these waters as a sort of "last resort" for liver disease. And hundreds of delighted witnesses may be found, especially in the warmer regions of the south, who bear a willing and grateful testimony to their utility in such cases.

Let us not be understood, however, as advancing the opinion, that sulphur water will cure every case of chronic liver disease. Far from it. We have already stated elsewhere, that mineral waters will sometimes fail in chronic diseases of *disordered action only*. This, it is most probable, happens in cases where the blood-vessels have been so long distended, as to have lost their power of returning to their natural state. Besides, it will happen that among the number of invalids that crowd our watering places, seeking relief from this common affection, many will be found, in whose livers organic lesions have already taken place. In such, perfect cures need not be expected either by sulphur waters or any other agents.

JAUNDICE is a form of liver disease in which the white sulphur water is used with very happy effects.

Although it is often met with at the springs, we remember but few cases that were not either radically cured or greatly benefited, from a proper perseverance

in the use of the water. In this, as in most other forms of liver disease, the salutary operations of the water will be hastened by the administration of some mild alterative medicine in connexion with it for the first few days.

CHRONIC ENLARGEMENT OF THE SPLEEN.—Disorder and enlargement of the spleen are very often met with at all our watering places. For many years we have carefully noted the operation of the white sulphur water in such cases. Unaided by other means, it has not altogether realized the high hopes which we once had of it. Satisfied of the great advantage, we might say absolute necessity in many cases, of urging a treatment more active than the water alone, we now rarely rely on it to the exclusion of other agents.

The preparations of iodine, used both internally and externally, are valuable adjuncts to the water in these cases. We have in some instances derived the happiest effects from large doses of quinine: and often find it necessary to aid the purgative operations of the water in these cases, by the use of mild cathartics.

3. CHRONIC IRRITATION OF THE BOWELS.

Our note book exhibits a variety of cases of disorders of the alimentary canal, which were treated by this water. They were generally connected with chronic irritation or inflammation, and attended with mucous or serous discharges from the bowels.

In such affections, attended with frequent or copious serous dejections, sulphur water, if admissible at all, should be used with great care, and in small portions at a time. In cases attended with much irritability of the canal, we have found the water entirely inadmissible.

Somewhat less difficulty is presented in mucous diarrhœa, and the action of the water is often favourable. We sometimes find an affection of the mucous coat of the bowels, especially in persons from the warmer regions of our country, connected with functional derangements of the stomach and liver, and, in such cases, it will usually be found, that in proportion as the tone of the former, and the healthful secretions of the latter, are restored, the morbid condition of the bowels cease. In no class of cases, however, if we except diseases of the lungs, is more prudence de-

manded in the administration of the water than in irritated conditions of the bowels. When judiciously and cautiously prescribed, the agent is not only a safe, but a valuable remedy in several diseases of this class; but when used, as it sometimes most imprudently is, in cases attended with exalted irritation, or ulceration of the coats of the bowels, the most prejudicial consequences may result.

In connexion with the water in this class of diseases, we often, and with excellent effect, use warm emollient cataplasms, with the internal administration of some mild alterative and soothing medicine.

To warm sulphur bathing in such cases, much confidence is due. To be safely and successfully employed, the bath should be carefully adapted, both as to *time* and *temperature*, to the demands of the case.

We know that it is usual to decry the use of sulphur waters in bowel complaints. We admit that those who enter at random, and without proper discrimination, upon their employment in such cases, will often have cause for regret. But we venture, nevertheless, to aver, that in many cases of *chronic irritation of the bowels*, attended with *diarrhœa*, they are, when properly administered, not only safe, but a valuable remedy.

COSTIVENESS.—Habitual constipation of the bowels is another affection for which the white sulphur water has been extensively employed.

Our success with the water in such cases has been various; and, while we must say, that it has not realized our early expectations of its potency in such cases, and especially in those of confirmed character; it has, nevertheless, been often beneficially used, even in the more obstinate forms of the disease.

PILES.—The use of mild laxatives in hæmorrhoides has been so long a favourite practice, that nothing need be said here in its favour. The beneficial effects of this water in Piles, are doubtless, in some degree, owing to its mild purgative operations, but to a still greater extent, to its alterative action. In most cases of this disorder, the liver is more or less implicated, and the relief of that viscus brings relief to the hæmorrhoidal vessels. We will only add, that both in the *common* and *blind piles*, the water is advantageously used.

4. DISEASES OF THE URINARY ORGANS.

Incipient Calculus affections are occasionally submitted to the use of this water, and for such cases it has long maintained a reputation. Cases are said to

have occurred, though none such have come under our observation, in which it is said to have displayed *lithontriptic* qualities.

The *palliative* effects of the water in calculus affections are often experienced to the great comfort of the sufferer; and it is only, we believe, in the earlier stages of such affections, that it can be regarded as better than a palliative.

Chronic Inflammation of the Kidneys, as well as similar affections of the *Bladder* and *Urethra*, are often successfully treated by this water. We deem it our duty, to allude to a very common error in the manner of using the water in these affections. We have reference to the practice of drinking it in large quantities, with the view of establishing copious discharges from the kidneys. By an imprudence of this kind, the cure of the case is not only often prevented, but lasting injury inflicted in a superadded debility of the organs.

In these cases the water should be so used as to keep up a gentle diuretic action for several weeks, carefully guarding against excessive discharges of this kind.

But few cases of genuine *Diabetes* are seen at the White Sulphur. One of great interest came under our notice some years since, in the person of Mr. S.,

a very intelligent gentleman from the State of Georgia. In this case, the water acted most efficiently for his relief. He had become greatly emaciated from the effects of the disease, but after using the water for ten days, he commenced regaining his flesh at the rate of one pound a day for a number of days. When Mr. S. left the Springs, his recovery was considered complete. Another case, last Summer, was so far relieved, as to give us confidence in its ultimate recovery.

Amenorrhœa, Dysmenorrhœa, and Atonic Leucorrhœa, are sometimes submitted to the use of the white sulphur water. For these disorders, considered specifically, we would not prefer this water. It is inferior in efficacy to many other remedies that might be employed. We often, however, find these affections connected with a peculiar state of the general system, rendering a valuable adjunct in their treatment. As a general rule, either local or general depletion, or both, as may be necessary, is required to precede the use of the water in these affections, when they are found connected with general plethora of the system, or with congestion in the uterine region. During the use of the water, the important auxiliary of warm sulphur baths should not be neglected.

Sufferers from the diseases under consideration should not lose sight of the potent influences which the baths at the *Hot Springs* are so well calculated to produce. Many who are languishing under the blighting influences of these affections, might, doubtless, find a sure and speedy relief from a few weeks' use of these valuable agents,

5. CHRONIC AFFECTIONS OF THE BRAIN.

Many interesting cases of chronic inflammation and congestion of portions of the cerebral mass, are met with at the White Sulphur.

It is only since the discovery of the successful use that may be made of the water, after being deprived of its stimulating gas, that it has been prescribed advantageously in affections of the brain. We have never, indeed, seen a case of inflammation of this organ, in which the fresh water could be borne. When it is carefully deprived of its gas, however, either by *heating* or by being *kept for a sufficient length of time in an open vessel*, it agrees well with such affections, and we have in many instances prescribed it with the most happy results. Mr. B., whose case we referred to in another part of this volume, had been for more than a year under the care of distinguished physicians for

the relief of chronic inflammation of the brain without having derived any permanent benefit, was cured by four weeks' use of the ungasous water. In this case it was carefully deprived of its gas by being heated nearly to the boiling point, and suffered to cool before using. This gentleman attempted repeatedly during the progress of his case, to use water that had stood twelve or eighteen hours from the spring, but found it too exciting, and was forced in each instance to return to the heated water.

Mr. M. arrived at the White Sulphur in June, 1839, labouring under agonizing distress in the head; attended at intervals with partial derangement, and with horrid threatenings of *confirmed mania* constantly before him. Cups were repeatedly applied to the base of the cranium, gentle cathartics were administered for a few days, and the water *perfectly deprived of its gas* was perseveringly pressed. In six days it became obvious that Mr. M. was improving, and in four weeks he left the Springs entirely restored. He has visited his "old benefactor," as he terms the White, every year since, and it is gratifying to know that his cure was in every respect complete and permanent.

Many cases might be mentioned not essentially dissimilar from the two just noticed, but we deem it

unnecessary. The efficacy of the water in chronic inflammation of the brain has been rendered as obvious to us, as its efficacy in similar inflammations of any other organ.

6. NERVOUS DISEASES.

The various nervous affections, such as *Neuralgia*, *Hypochondria*, *Hystericks*, *Chorea*, *Palsy*, &c., &c., are not unfrequently met with at the Springs: sometimes as primary or *independent* diseases, but more frequently in connexion with derangements of the digestive organs. The direct influences of the water in restoring the tone and energy of the general system, by removing obstructions and correcting the functional derangements of the organs, obviously point to it as a remedy in the latter class of cases. The invigorating effects of the salubrious and charming climate in which the Spring is situated, and, we might add, the advantages of the exercise necessary to reach it, are efficient auxiliaries in such cases.

In *simple* or *independent* affections of the nerves; (those that do not depend upon disease in other organs,) the waters of the *Sweet Spring* is a valuable remedy. Indeed, in nervous disorders generally, whatever be

their cause, the bracing influences of that water, especially of the delightful *bath* at the place, will be found serviceable after sulphur waters have corrected the digestive and assimilative organs.

For the treatment of this class of affections when perfectly unconnected with organic derangements, we would also call attention to the "*Rawley Springs.*" The Rawley water is the purest and strongest chalybeate that is found in our country, and where a strong iron tonic is demanded, it may be relied on with confidence. For several years we have occasionally caused patients to avail themselves of this water, and have generally been much pleased with its effects.

7. CHRONIC DISEASES OF THE CHEST.

Diseases of the *Chest* have become alarmingly common in our country, and especially in the north and north-western portions of it. In some of its forms, it is admittedly incurable by the remedies of the *shops*, and, hence, its victims may be found at all our watering places, eagerly seeking that relief abroad which the candid and honourable of the profession cannot promise them at home.

In prescribing sulphur waters for diseases of the

chest, much caution, with a proper knowledge both of the agent and the disease, is demanded. There is a *peculiar form* of breast disease,—by many mistaken for genuine consumption, in which this water may be used with profitable results,—whilst, for every other form of the same disease, it would be improper and probably injurious.

Those who have not made disease a matter of study and investigation, are apt to suppose that all affections, sweepingly denominated “*breast complaints*,” are genuine consumption of the lungs, and partake of all the essential characteristics of the *idiopathic* consuming disease, thus properly called.

Here let us premise, that in confirmed *Tubercular Consumption*, this water is *not* a remedy; on the contrary, its continued use in such a case would scarcely fail to prove injurious.

The *peculiar form* of breast complaint, just alluded to, and which we have said is often mistaken for genuine consumption—we shall take the liberty of calling *Sympathetic Consumption*, because this name will more clearly convey an idea of its character than any other we could give it. This form of breast affection, although not peculiar to, appears most frequently in persons of some constitutional predisposition to consumption; and is the result of morbid sympathies

extended from other parts of the body, and, more commonly, from a diseased stomach or liver. It not unfrequently happens, that the stomach, in protracted dyspepsia, throws out a morbid influence to the wind-pipe and surface of the lungs, occasioning cough, expectoration, pain in the breast, and many other usual symptoms of genuine consumption—and, so completely does this *translated* affection wear the livery of the genuine disease, that it is often mistaken for it. It is in this *sympathetic*, or translated affection alone, that the white sulphur water can be prescribed with prospects of benefit. Its beneficial operations in such cases, are not through any primary influence exerted upon the lungs *directly*—but, upon the organ originally affected,—by the relief of which, the superinduced irritation of the pulmonary organs subsides.

Sympathetic affections of this sort come under our notice during every watering season, and when we can be clearly satisfied, that the disease is not primarily in the lungs—and that no tubercles, either in an immature or a matured state, exist there, we have no hesitancy in recommending the use of the water, and have often in such cases, witnessed very pleasing results from it;—the more so, because its efficiency resolves a painful doubt in the mind of the patient as to the true character of his disease.

But whatever be the pathology of the original cause of the disease;—if, at the time, there exist fever, much emaciation, regular night sweats, expectoration of pus, spitting of blood, or diarrhœa, it would be improper to use the water.

The Red Sulphur Springs constitute a valuable remedy in the class of *translated* affections we have been considering. The water of these springs being more bland and less stimulating than our mineral waters generally, point them out as a safer agent in pulmonary irritations, than our other mineral fountains.

Bronchitis is often met with at all our watering places; sometimes as a primary affection of the bronchia, and often in connexion with other diseases.

Of late, this has become an exceedingly common disease with the clergy of our country; so much so, as eminently to demand an investigation into the peculiar causes that render this valuable class of men so subject to its influence. Such an investigation would not only be highly interesting as a curious subject of pathological inquiry—but also might be valuable by enabling the clergy to avoid the exciting and predisposing causes of the malady. It is not our purpose to enter into this investigation; it would be foreign to the objects of this work; but merely to observe, for

the benefit of those thus afflicted, that the mineral waters of this region, afford encouraging prospects of relief. We occasionally meet with cases that are relieved at this place; and similar results occur at all our watering places.

The *Red Sulphur* is well adapted to many cases of bronchitis. When a strumous diathesis prevails, the waters of the *Alum Springs* are happily adapted for relief, and in such cases, we are disposed to give them a preference over any of our springs.

We often see *Bronchitis* at the White, give way, and disappear, in the same ratio in which the water exerts its alterative power over the digestive and assimilative organs. Dr. R., of lower Virginia, was relieved of an obstinate attack in this way; an officer of our navy experienced the same good fortune.

8. CHRONIC DISEASES OF THE SKIN.

Few diseases yield with more certainty to a persevering use of sulphur waters than chronic affections of the skin. In these as well as in other diseases, however they are subject to be misapplied,—they are adapted only to cases in which the eruptions are chronic, or unattended with acute inflammation. In

such cases, and united with *warm sulphur bathing*, great reliance may be placed in them.

It is often gratifying to residents at the springs, to witness the progressive amendment, and ultimate recovery, in the course of the season, of persons who come there with unseemly affections of this kind.

We occasionally see eruptive disorders located in the beard of gentlemen, generally caught from want of care and cleanliness on the part of their barbers. This affection, although slight at first, assumes in its progress an obstinate and unpleasant character. The sulphur water, in connexion with the external application of the cream-like deposit found about the spring, will ordinarily be successful in its relief.

In *Ill Conditioned Ulcers* of the extremities, the water often displays fine effects. In these cases we ordinarily prefer that it be so taken as to make decisive impressions both upon the *bowels* and *skin*.

9. RHEUMATISM AND GOUT.

Next to diseases of the abdominal viscera, rheumatism is most frequently met with at our watering places. The ancient reputation of the White Sulphur, and that, which at an early day, directed public atten-

tion to its potency, was derived from its successful use in rheumatism. Tradition says, that the efficacy of this spring in this disease was known to the Indians whilst they dwelt in the country: and it is a matter of history that the first important cure it is known to have effected among the whites, was in a disease of this kind. The reputation thus early acquired has not been lost, but, on the contrary has, become established by the experience of more than half a century.

It must be borne in mind, however, that it is not adapted to every case of rheumatism. It is only in the chronic form of this disease, when active inflammatory action is not present, that it can be looked to for success.

We often see at our watering places, and particularly in persons from warm miasmatic regions, a form of rheumatism intimately connected with and dependant upon derangement of the internal organs. For the cure of such cases, the water is peculiarly adapted. The same discriminative and especial praise may be bestowed upon it in *mercurial* rheumatism, which we occasionally find connected with chronic inflammation and enlargement of the bones. In most cases it will be advisable to connect the use of *warm* or *hot* bathing with the drinking of the water, and in many,—

especial advantage will be derived from the local application of this adjunct in the form of a *douche*.

The united effects of these agents, operating for a sufficient length of time, rarely fail to relax the rigidity of the muscles, to give strength, ease, and elasticity to the diseased joints, and to impart vigour and tone to the whole system.

The great and deserved reputation of the *Hot Springs* in diseases of this class, is too familiar to the public mind, to require any special comment from us. The delightful and well contrived arrangements at that place for receiving baths of a variety of temperature, and from the *douche* to the general *sweating* process, gives to that place decided advantages, so far as bathing is concerned.

Gout is not unfrequently seen at this, and all our watering places. The general operative influences of sulphur waters, and the tone and energy which they impart to the digestive and assimilative functions, are often serviceable in this painful affection; and especially, when with the use of the water, the patient pursues that prudent course of regimen which in this, not less than in other diseases originating in the stomach, is absolutely necessary to a cure.

As a palliative, the water is very generally serviceable.

10. SCROFULA.

The celebrated Dr. Armstrong states that he found the internal and external use of sulphur waters far more efficacious in scrofula than the common measures; for, after all the ordinary treatment had failed, he had seen scrofulous affections cured by drinking such waters, and using them as a tepid bath.

We regret that we cannot award the same unlimited praise to sulphur waters in such cases. Our success with them has been various. In the early stages of scrofulous affections, their administration is generally attended with benefit—occasionally, with marked benefit; in the advanced stages, there is generally less cause of gratification, though even in such we have occasionally seen them serviceable, and in no instance injurious, except in a single case, which was attended with ulceration of the bowels.

The Alum Spring offers a valuable resource in scrofulous affections. In the united use of sulphur and alum waters in this disease, there is a perfect compatibility, and the employment of the former for a few weeks, often constitutes the best preparation for the use of the latter.

11. DROPSIES.

The alterative influence of sulphur waters is sometimes displayed not less upon the *absorbent* than upon the secretory system, hence, under its influence, watery accumulations sometimes disappear. It is, however, in that species of dropsy, originating in, and dependent upon, obstructions of some of the glands of the body, that sulphur waters are most commonly used successfully.

12. MERCURIAL DISEASES.

In that enfeebled and peculiar condition of the system, resulting from the long protracted or injurious use of mercury, the white sulphur water has displayed its happiest effects.

The extraordinary powers of the water in correcting the injurious *constitutional* and *local effects* of this drug upon the system, cannot be appreciated too highly by the medical profession or the public.

After a long experience with the water in this peculiar form of disease, we have no hesitation in observing;—that if called on to designate a particular

affection, or state of the system in which this agent is most beneficial, we would not hesitate to name *mercurial disease*;—because we regard the water in such cases as a specific agent; and as almost certain to bring relief where other known agents would not. This I know is strong praise, and nothing but long and successful observation could induce us to award it.

Of the many patients afflicted with disease from the abuse of mercury—and many of them in a state of great wretchedness—who annually resort to this place for relief; we have rarely seen a case in which the water was properly used for a sufficient length of time, that was not either *cured*, or so *relieved*, as to evidence the triumph of the remedy in the case. The salutary action of the water in such cases may be considerably expedited by uniting with it some of the preparations of sarsaparilla or of iodine. The warm sulphur bath also, in such cases, comes in as an important auxiliary.

The patient labouring under this anomalous affection, is required to exercise fully as much patience in the use of the water as is demanded in any other case. To make it fully successful in bad cases, from one to three months use of it will generally be required; occasionally intermitting it, for short periods, during this time.

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A BRIEF NOTICE
OF A
PORTION OF A WORK BY WILLIAM BURKE,
ENTITLED
"THE MINERAL SPRINGS OF WESTERN VIRGINIA."
WITH
PRELIMINARY REMARKS ON THE RELATIVE VIRTUES
OF THE SALINE AND GASEOUS
CONTENTS OF THE
WHITE SULPHUR WATER.

(First Published in 1843.)

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PRELIMINARY REMARKS ON THE RELATIVE VALUES

OF THE SALTS AND LIGNITE

CONTAINED IN THE

WHITE SULPHUR WATER

(By William Berry)

CHAPTER V.*

ON THE RELATIVE VIRTUES OF THE SALINE AND GASEOUS
CONTENTS OF THE WHITE SULPHUR WATER.

SPECULATION has existed as to the relative efficacy of the different component parts of the White Sulphur Water in the cure of disease, and while some have supposed that its *gaseous contents* are essential to its sanative virtues, others, and we think the best informed observers, attribute its medicinal virtues mainly to its *solid* or *saline contents*. To the latter opinion the able Professor of Natural Philosophy in

* This CHAPTER is a part of a work in manuscript, on the "*Mineral Springs of Virginia*," which has been lying by us for some time nearly ready for the press, and which would have been published before this period, but for our desire to procure accurate drawings of some of the more celebrated watering places, and to obtain more specific information in relation to the composition and medical effects of some of the mineral waters in Eastern Virginia.

the University of Virginia, who has carefully examined the water, and other distinguished chemists and physicians, decidedly incline.

It certainly is a question of no little interest to the valetudinarian, whether he should use this water fresh as it flows from the spring, and abounding in all its stimulating gas; or whether he should use it after it has *partially* or *entirely* parted with this gas. To this subject we have, for the last several years, devoted the most laborious and particular attention, having instituted, with great care, various and diversified experiments, in order to establish something like definite and positive conclusions.

Although the value of this water in what is usually termed its *non-stimulating form*, or, in other words, when deprived of its gas, has long been known to many who are familiar with its use, it was not until the last few years that it was commonly used from choice, after it had been long removed from the spring, or from any cause had parted with its gaseous contents; an opinion, the correctness of which had never been examined, prevailed in the minds of many, that in losing its gas, it lost its strength and efficacy.

Having settled at the "White," as the resident physician of the place, it became alike our duty and our interest to investigate the character and operations

of its waters under every possible form and modification in which they could be presented. In the pursuit of this duty, we resolved to take no opinion upon "trust," but carefully to examine and investigate for ourselves. A prominent question immediately presented itself for inquiry, involving the relative merits which the *solid* and *gaseous* ingredients of the water possess as remedial agents. It would be tedious, and, to many uninteresting, to detail the several steps and multiplied experiments which led us to conclusions upon the subject, satisfactory to our own mind, and upon which we have established certain practical principles in the use of the water, which have enabled us to prescribe it, especially for nervous and excitable patients, with far greater success than heretofore. It is sufficient for our purpose at present, to state, that while we freely admit that the *sulphuretted hydrogen gas*, which abounds in the water, is an active *nervine stimulant*, and therefore may be a most potent agent in some cases, we are fully impressed with the belief that either in its *direct* or *indirect* effects, we must look *mainly* to the *solid contents* of the water for its *alterative* power as well as for its activity manifested in its operations through the different emunctories of the human body.

Whether the efficacy of the solid contents of this

water be owing to the specific character of any one, or to all of the *thirteen different salts* of which it is composed, and which exist in the water in the most minute form of subdivision, and in this condition enter the circulation, and course through the whole system, applying themselves appropriately to diseased tissues; or, whether its efficacy depends upon the *evolution of sulphuretted hydrogen gas after the water has reached the stomach*, is a matter of curious and interesting inquiry.

The distinguished chemist, Mr. Augustine A. Hays, of Roeksbury, after having bestowed much pains in analysing the white sulphur water, and in studying its peculiar character, comes to the following conclusions as to the source of its medicinal power. After describing, at considerable length, a certain matter which he found to abound in the water, and which he terms "*organic matter*," in the course of which he says, it "differs essentially from the organic matter of some thermal waters," he proceeds to say, "In contact with earthy sulphates, at a moderate temperature, it produces hydro-sulphuric acid, *and to this source, that acid contained in the water may be traced.* This substance does not rapidly attract oxygen from the atmosphere, and from coloured compounds, as some other organic compounds do,—*the medicinal properties*

of this water are probably due to the action of this organic substance. The hydro-sulphuric acid resulting from its natural action, is one of the most active substances within the reach of physicians. *There are chemical reasons for supposing that, after the water has reached the stomach, similar changes, accompanied by the production of hydro-sulphuric acid, takes place.*"*

Before Mr. Hays had communicated the above opinion, growing out of his chemical examinations, we had again and again been much interested with certain phenomena which we have termed the *secondary formation* of gas in the white sulphur water. Instances had frequently been reported to us of the water having been put into bottles after it had *lost its gas entirely*, being void both of taste and smell, and yet, after these bottles were kept for some days in a warm situation, and then opened, the water appeared equally strong of the hydro-sulphuric acid, as it is found to be fresh at the fountain.

In a shipment of this water to *Calcutta*, some years since, the "transporting company" had the water bottled in Boston, from barrels that had been filled at the spring six months before. This water, although

* See Hays' Analysis, Chapter II.

tasteless and inodorous, when put into the bottles at Boston, was found, on its arrival at Calcutta, so strongly impregnated with the hydro-sulphuric acid gas as to render it necessary, under the direction of an intelligent gentleman of Boston, (who had witnessed this secondary formation of gas before, (to uncork the bottles for some time before using, that the excess of gas might escape.

We had also known that in the process of *thawing* sulphur water in a warm room, that had been previously frozen, sulphuretted hydrogen gas is evolved: for although the ice has neither the taste nor smell of sulphur, a strong smell of sulphuretted hydrogen gas is manifest as the ice is returning to water.

We had often observed that individuals who drank the water entirely *stale*, and void alike of *taste* and *smell*, were as liable to have eructations of sulphuretted hydrogen gas as those who drank the water fresh at the fountain. These, and other facts connected with the peculiar operations and effects of this water, when used in its ungasous form,—operations and effects which we cannot here with propriety refer to, but all going to prove the *secondary* formation of gas under certain circumstances,—had, in our investigations of this water, interested us exceedingly, and consequently, we were not a little pleased that Mr. Hays'

chemical examinations so fully sustained the opinions we had been led to entertain from our personal observations.

The interesting opinion of this distinguished chemist, in connexion with the numerous proofs, derived from analogy and observation, of the *secondary* formation of sulphuretted hydrogen gas in this water, would seem to be well calculated to harmonize the opinion advanced by us of the equal efficacy of the water when deprived of its gas, with the sentiment entertained by some, that the hydrogen gas is essential to its sanative operations.

The phenomena of a *secondary formation* of sulphuretted hydrogen gas in mineral waters, has not, that we are aware of, been noticed before; it certainly has not in relation to the white sulphur water, and we sincerely hope that medical gentlemen generally, who may have occasion to use the water, will direct a careful attention to this singular fact. For ourselves, we promise still further to investigate this interesting subject, and may, at some subsequent period, lay the results of such investigation before the medical public.

Our investigation of the relative virtues of the gaseous and saline contents of this water, have fully satisfied us that the physician, in making up his judgment

as to the best method of administering it in particular cases, may always properly moot the propriety of using it either *fresh* as it flows from the spring, *deprived of its gas*, or with *modified quantities*. He should bear in mind that there are cases in which it is preferable that the water should be used *stale*, and entirely free from its gas, and that by depriving it in *whole* or in *part* of its hydrogen gas, which is its stimulating principle, he can graduate that amount of stimulus to the system which it may demand, and this, in most cases, without lessening the *actively operative* or *alterative* effects of the water.

For some patients, the white sulphur water, as it flows from the spring, is too *stimulating*, and hence, before the *non-stimulating* method of using it was introduced, many such patients annually left the Spring,—either without giving the water a trial, or actually rendered worse by its stimulating influence. This class of persons can now use the water *when deprived of its gas*, not only with impunity, but often with the happiest results. Numerous cures, effected by the use of the water for the last three or four years, have been in that class of patients by whom the water, *fresh at the spring*, could not have been used without injury. The cases of Mr. Morton, of Mississippi, and of J. L. Jernagan, Esq., reported at

large in a pamphlet published in 1841, are pertinent examples of such cases.

In the case of many nervous persons, and especially those whose *brain* is prone to undue excitement, we have often found it necessary, either by *freezing* or *heating* the water, to throw off its gas completely, before it could be tolerated by the system; and some of the happiest results that we have ever witnessed from the use of the water, have been achieved by it after being thus *prepared*. The cases of Mrs. H., of Georgia, and of Mr. B., of Massachusetts, the one afflicted with disease of the stomach and chest; the other with chronic inflammation of the brain, are instances, among scores of others, that might be referred to. But this is not all. With the view of guarding effectually against any errors that might arise from a defect in our own observations, we procured the assistance of several physicians, and other intelligent gentlemen, all of whom were familiar with the operations and effects of the water when drunk fresh at the spring, and who, with the view of testing the facts we have mentioned, used it themselves, and gave it to others, after it had been long removed from the spring, and to all appearances *parted with its gas*; and with the same results that they had previously experienced in their own persons, or witnessed in

others, from like quantities of the *fresh* water, abounding in its gas.

Our object in prescribing white sulphur water has been to pursue a discriminating or *pathological* practice. We regard it as an active and potent *medicine*, and believe that, like all such medicines, it should be used with a wise reference to the nature of the case, and the state of the system. We must not be understood as advancing the opinion, that the white sulphur water is always to be preferred after the escape of its gas. We entertain no such opinion; on the contrary, for a large class of visiters to that watering place, we think it preferable that they should avail themselves of the use of the water either at, or recently removed from the fountain, and as it naturally abounds in sulphuretted hydrogen gas. There are other cases in which the exciting influence of the gas can only be borne *in a more limited degree*, and, for such, we permit its *partial escape* before using the water; while in a numerous class of cases, (and especially on first commencing the use of the water,) we esteem it indispensable to its quick and beneficial operations, that its *uncombined gas*, which gives *taste* and *smell*, should have escaped.

In recommending the white sulphur, then, to the use of the invalid, we esteem it quite as necessary to

investigate the manner of using, as relates to its *fresh* or *stale* quality, as we do in reference to its dose, or the times of administering it; and for neither would we lay down positive and absolute rules in advance; for each case must, in the nature of things, to a great extent give rules for its own government.

[Illegible text]

A BRIEF NOTICE

OF A

PORTION OF A WORK BY WILLIAM BURKE,

ENTITLED

"THE MINERAL SPRINGS OF WESTERN VIRGINIA."

DURING the past summer, and after the preceding chapter upon the relative medicinal virtues of the gaseous and saline contents of the white sulphur water had been completed, an opportunity was afforded us of examining a little volume, then recently published, by Mr. William Burke, the Proprietor of the Red Sulphur Springs, entitled, the "Mineral Springs of Western Virginia."

In this work, the author has arraigned us before the public in a manner so unjust, and at the same time so virulent, that however reluctant we may be to enter the arena of controversy, we feel that he has

left us no alternative. In the defence, however, of our character as a man, and of our views as a physician, we shall endeavour to curb those angry feelings which malignant aspersions are so well calculated to arouse; content to inflict no wound more severe than will follow the recoil of a futile effort to effect a sinister and selfish end.

That the public may be enabled more readily to appreciate the merits of the issue between Mr. Burke and ourselves, we deem it better at once to lay before them a few prominent facts—which facts, we believe, will not only afford a key to the controversy, but shed much light upon the motives by which Mr. Burke has been actuated in dragging us before the public, at the expense alike of justice and the common courtesies of life.

In the first place, he and ourselves are entire strangers to each other, and have had no intercourse which could possibly have engendered the slightest degree of personal hostility. *In the second place*, Mr. Burke is the *Proprietor* of the *Red Sulphur Springs*, the water of which, he contends, is not only destitute of stimulating properties, but even *sedative* in its effects; a peculiarity, whether real or imaginary, upon which rests solely, or in an eminent degree, its medicinal reputation. *Thirdly*; it is generally admitted

that the white sulphur water, in its natural state, and as recently taken from the spring, is decidedly *stimulant*; and further, that its stimulating effects depend upon the sulphuretted hydrogen gas contained therein. *Fourthly*; it is well known that the sulphuretted hydrogen gas, or stimulating constituent of the recent white sulphur water, escapes upon suffering that water to stand for some hours in an open vessel, or is driven off by heating it. And *Fifthly*; it follows, from what has been said relative to the stimulating effects of the gas, its escape, &c., that if the medicinal properties of this water reside mainly in its saline ingredients, by suffering its gas to escape, the water may be so modified as to adapt it to those cases wherein a stimulant is contra-indicated, and in which the aperient and alterative effects of the water would prove essentially beneficial.

If, in connexion with what has been said above, the reader will take into consideration the further fact that, in times past, many valetudinarians were in the habit of leaving the White Sulphur Springs because of its stimulating property—and for that reason alone—to seek relief at the “Red,” he will have, we believe, a clew by which he may readily be conducted to the source whence Mr. Burke's assault, upon what he is pleased to term *our theory*, has emanated. Sup-

pose, for a moment, that "our theory" be correct, and that indisputable facts can be adduced, sufficient, in number and character, to show that the water in its modified form, and divested of its stimulating property, retains not only its aperient but its alterative agency, and thus becomes adapted to those cases wherein, but for its stimulating character, it would, in its natural state, have been indicated,—what then becomes of the patronage which the "Red" once received from cases of this class? Can any one suppose that, under such circumstances, a preference would be given to the Red Sulphur? The idea, to one acquainted with the relative alterative value of the respective springs, is preposterous; and those not familiar with the subject may readily infer, from the extreme sensitiveness of the "Proprietor of the Red," that he regards the grounds of alarm as by no means trivial.

The reader of Mr. Burke's book can scarcely have failed to observe the striking incongruity existing between the title page and the general character of the work; and whilst he observes, no doubt will, with ourselves, admire the shrewd sagacity which the parent has manifested in introducing his offspring to the world. A good name not unfrequently gains a reception, when the true character of its possessor could not have obtained an audience; and no doubt

the author has found a work, *purporting* to be a treatise upon the mineral springs of Virginia, a much more saleable article than he would have found the same work had he endorsed thereon, as he appropriately might, "*An elaborate puff of a second-rate Mineral Spring, by the Proprietor thereof; with brief, and sometimes disparaging notices of other watering places.*"

After having carefully examined the work of Mr. Burke, and maturely reflected upon its general character, we are forced to the conclusion that the attack which he has made upon ourselves should be regarded in no other light than as incidental to the general scheme—as a mere tributary towards the accomplishment of the end for which his book was written. What was that end? To elevate in public estimation the medicinal virtues of the Red Sulphur Springs. Our humble self and our "theory" stood in his way, and must be removed. The obstacle thus opposed may have been trivial, yet its suppression was deemed necessary. How was it to be accomplished? To charge our "theory" with injuring his Spring would not answer,—his motives might then have been suspected; he assumes a virtue not his own; he hearkens to the dictates of "duty," and impelled by the irresistible spirit of philanthropy, steps forward to the

rescue. Over the deluded victims of our "theory" he stretches the broad ægis of his protection, dispels the darkness that envelopes them, and rejoices in the hope that they will yet quaff the waters of *his* health-giving fountain.

We have heretofore alluded only in general terms to the attack made upon us by Mr. Burke; but preferring that he should speak for himself, we quote from his work, pages 107-8: "Feeling deeply the great value of this water (*the white sulphur*) to the public, and solicitous that its fame may not be even temporarily affected, we feel it a duty we owe to the worthy proprietors of the fountain, as well as to the community at large, to notice a theory which has been lately sought to be established respecting it, and which, if true, renders it liable to be successfully imitated by any one who can mix with common water the different portions of saline matter discovered by its analysis. We allude to a theory set forth in a pamphlet by Dr. J. J. Moorman, resident physician at the Spring. We disclaim any intention of affecting the interest of Dr. Moorman. He is personally unknown to us. But since we have undertaken to present our views on these mineral waters, we feel morally bound not to sanction, by our silence, a theory fraught, we believe, with injury to the reputa-

tion of this justly popular water, and with cruel injustice to poor invalids who seek benefit from its use. In the discussion of this subject, we will not impugn Dr. M.'s motives in propagating this doctrine. With these we have nothing to do."

And again, pages 112-13: "We understand the theory in question originated in the following manner: Dr. M., some years ago, entered into an arrangement with Mr. Calwell for transporting the water. It was attempted in bottles, but that was found too expensive, and the *idea* of barrelling was adopted. But here was a difficulty—the gas would escape. What was to be done? Why it must be shown that the gas was of no use; nay, that it was a detriment, and, like 'toddy or wine,' an active nervine stimulant. It became necessary to prove that the water was better without gas than with it; and accordingly Dr. M. recommends to his patients to let it stand in an open vessel twelve or eighteen hours before use. Dr. M. tells you that it is a common practice to pursue this plan at the Spring; but we regret to perceive he has not the candour to acknowledge that *he* introduced the practice; and that no such practice was known from the days of Adam until the days of Dr. M."

From these two quotations, it will be perceived,

that while Mr. Burke, on page 108, disclaims all intention of impugning our motives in propagating the doctrine to which he objects,—yet upon pages 112 and 113, while giving what he “understands” to be the origin of the theory in question, he does the very thing which he had disclaimed all intention of doing, and that in a manner but little creditable to his frankness and ingenuousness. Fortunately, we have it in our power to show, that the “idea of barrelling” was not an after thought;—that it was not only contemplated, but specified in the original and only contract ever entered into between Mr. Calwell and ourselves relative to the transportation of the white sulphur water, and consequently that what Mr. B. “understands” to be so and so—IS NOT so; and that inasmuch as his *facts* are overthrown, his deductions must fall to the ground. We would call the attention of our readers to the following letter from Wm. B. Calwell, Esq., a gentleman whose statement we presume Mr. Burke will hardly gainsay.

WHITE SULPHUR SPRINGS, Aug. 10, 1842.

Dear Sir,—I have read the note you handed me a few days ago. I have no objection to the publication of the *original* and *only* contract between us, for the transportation of the white

sulphur water; or to state in so many words *that it does provide in the first instance*, for transporting and vending the same both in *barrels* and bottles.

I am, respectfully, your obedient servant,

WM. B. CALWELL.

To DR. MOORMAN,

Present.

Having thus, we conceive, removed the basis of Mr. B.'s most direct assault upon the probity of our motives, we will proceed to examine the various objections which he urges to what he terms *our* "theory," and hope to be able to satisfy the public that our practice, and the views promulgated by us, have not only an honest origin, but are sanctioned by experience, and are entirely consonant to well established pathological and therapeutical principles.

But, before we proceed farther with this part of our subject, we would respectfully call the attention of the public to the respective positions occupied by Mr. B. and ourselves, relative to the White Sulphur Springs. He is the *proprietor* of a would-be rival watering place; we, the Resident Physician at the White Sulphur. Which, under the circumstances, we would ask, is likely to feel the deepest interest in the reputation of that water? Again, which is the most likely to understand the character and peculiarities of

the white sulphur water? Mr. B., we believe, visited that watering place once, some nineteen or twenty years since, and probably remained a few days; with ourselves, the *modus operandi* of the water, both in its natural and modified form, at the spring and abroad, and its applicability to disease, in its almost innumerable forms, has been for years a subject of continued investigation and study. Under these circumstances, will the public regard us as guilty of presumption in supposing ourselves to be better acquainted with the therapeutic agency of the water, whether in its natural or modified forms, than Mr. Burke?

With regard to the origin of what Mr. B. terms *our* "theory," we must be permitted to say, that the practice of using the white sulphur water after the escape of its gas, whatever may be the merits or demerits of that practice, did not originate with us, as Mr. B. asserts. Gentlemen of the highest respectability, residing in the vicinity of the White Sulphur, had been in the habit of using in their families the *barrelled* water for many years before we became, in any way, connected with that watering place. Of this fact Mr. Burke must have been aware, as the letters of Dr. Thomas Creigh, Dr. Hugh Wilson, Henry Erskine, Esq., John Mays, Esq., James Frazer, Esq., The Hon. Ballard Smith, and others, *were before him*

in the pamphlet from which he quotes, at the time he penned his offensive charge. These gentlemen all bear testimony, not only that the *ungaseous* water had been long used from the barrel, but also to its *equal efficacy* when thus used.

Dr. Creigh states, that he has "been in the habit of advising persons to use the white sulphur water that had been *long kept in barrels*; and having carefully observed its effects upon such, can safely state, that its medicinal properties are not deteriorated by being thus kept. On the contrary, those salutary *alterative* impressions, for which the water has been so long distinguished, are most happily displayed from the use of the barrelled water."

Dr. *Wilson* states, that he has known it to be used "after being *kept in barrels* for twelve months, and after it appeared to have parted with all or most of its volatile properties, and that *it acted as promptly and efficiently* as when used at the spring."

Henry Erskine, Esq., has used the barrelled water regularly in his family for "many years," and says: "*We have found the water in every respect as efficacious* when thus used, as when taken fresh from the fountain itself."

John Mays, Esq., has used it from the barrel "for *upwards of thirty years*," and states, that the water

thus used, "in all its *sensible operations* and *permanent effects upon the system*, is quite as active and efficient as when drunk fresh at the fountain."

James Frazer, Esq., says: "I resided at the White Sulphur Springs from the year 1810 to the fall of 1819; during that time the water was used by myself and family fresh from the fountain. Since that time we have been in the habit of using it in *barrels*, and we find *no difference in its medicinal qualities or effects.*"

The Hon. *Ballard Smith* has used the *barrelled* water in his family, and his "experience authorizes the expression of the opinion, that its efficacy is *not lessened* by being confined in the barrel, but *rather increased*, as he generally found it took a *less quantity*, *after having remained in the barrel* for two or three weeks, to produce the cathartic effect, than when used at the fountain."

Such is the character of the testimony *that was before Mr. Burke* when he penned the assertion, that we "introduced the practice" of using the ungasous white sulphur water. Notwithstanding the conclusive refutation of such an assertion, which was *then in his own hands*, he had the hardihood to make an assault upon our "candour" for not having acknowledged that we originated the "practice."

We could wish, indeed, we were entitled to the merit of originating a practice which has benefitted the afflicted in the same ratio that it has extended the applicability of a valuable mineral water; but although we are not entitled to the merit of originating the practice, we enjoy the pleasure of believing that we have done the public some service, by our efforts to systematize and to promulgate its advantages to the world.

We have now concluded what we designed to say in reference to Mr. Burke's personal assault upon us, and exhibited *testimony* deemed sufficient to disprove the correctness of his charges, and proceed, with as much brevity as possible, to examine the *arguments* urged by him for the overthrow of *our* "theory." Before we do this, however, we wish to say a few words in reference to the *medical reasons* which influence us to vary our prescriptions in the use of white sulphur water. We shall do this more briefly, and perhaps more distinctly, by *supposing cases*, adapted to the use of the water in its different forms.

Such explanation of our opinions is rendered the more necessary by the injustice which Mr. B. has perpetrated towards us; in endeavouring to induce the belief that *we* entirely deny and repudiate the efficacy of the sulphuretted hydrogen gas as a therapeutic agent,

and by asserting, as he virtually does, that we attempt to "prove that the water is better without its gas than with it."

Such opinions have never been either held or expressed by us, except with a qualification having reference to particular cases.

The great value of the white sulphur water as a therapeutical agent to a large class of persons who visit that celebrated fountain, is a fact alike unquestioned and unquestionable. That in its natural condition, as it flows from the bosom of the earth, it is happily adapted to numerous cases of disease, is a truth established by upwards of sixty years' experience, as well as fully sustained by the numerous cures that are constantly occurring. The great value of the water, then, fresh as it flows from the fountain, and abounding in its gas, is a truth, so far as we know, that is unassailed, and which, *we* believe, is unassailable. Nevertheless, that there are many cases in which the gas is not beneficial in the amount in which it exists in the fresh water, is a fact which our experience enables us to assert with the utmost confidence. That the water in such cases, therefore, is "better without its gas than with it," follows as effect follows cause. But we never have contended that the water, *per se*, and without reference to cases, should always

be preferred without its gas. We have not based our practice upon any such exclusive views; nor have we ever denied the value of the agency of the gas in appropriate cases. Our opinion of the relative importance of the saline and gaseous contents of the water has been often expressed, and always with this qualification: that the "medicinal properties of the white sulphur water reside *mainly* in its solid contents." We never contended, or attempted to "prove," that its medicinal virtues reside *exclusively* in its solid contents; and it is scarcely candid in Mr. B. to form a theory for us, that he may have the pleasure of combating it. The public, we are sure, will accord to us the right to *define our own positions*, and we now briefly recapitulate them.

We, then, regard the *solid contents* of the white sulphur water, either in its direct or indirect influences, as the *main* agency in the medicinal efficacy of the water. Whether the efficacy of the salts of the water be owing to their absorption into the system as such, or whether it depends upon the *secondary formation* of hydrosulphuric acid gas in the stomach, or whether it ought to be ascribed to the combination of these different agencies, we leave for others more fond of speculation to decide. We have heretofore been satisfied with the *knowledge* of the efficacy of the solid

contents, without much theorizing to explain the *why* and *wherefore*.

But, it may be asked, If the gas does good in the state of a *secondary formation* in the stomach, would not a larger quantity, taken with the fresh water, do more good? We reply, that this by no means follows in that class of cases for which we specially advise the ungaseous water; for our only objection to the fresh water in such cases is, that it has *too much gas*. Admitting, then, as we do, that the gas may exert an influence, we allege that in nervous and excitable cases, the quantity is not only better adapted to the system, but that any given quantity, under a secondary formation, excites the system less, from its gradual formation in the stomach, than if suddenly received in volume into that viscus.

Do we, because we recommend the ungaseous water in *particular cases*, repudiate and disallow all medicinal agency of the gas as a general principle? Not at all. We simply contend that for the treatment of certain cases, there is more of the stimulating gas in the fresh water than such cases can bear with advantage or impunity; and that its excessive excitation in such cases would be prejudicial instead of beneficial.

But do we find it necessary thus to guard the amount of gas for every water drinker? or do we

erect a bed of *Procrustes*, and oblige every man to conform to its length? By no means. A. arrives at the springs, not much debilitated by disease, and with a firm, nervous, and muscular system; there is no excessive excitability in his case, and neither his cerebral, nervous, or vascular system is particularly prone to be affected by stimulants or exciting medicines. We advise him to use the water *as it flows from the fountain*, and if he should, contrary to expectations, find that it stimulates him unpleasantly, to set it by for awhile before using.

B. calls for advice as to the manner of using the water;—his *temperament*, and the state of his cerebral, nervous, and vascular system is the opposite of A's,—his physical energies have been prostrated by disease; his nerves are *unstrung*, and, like his brain, prone to be painfully affected by stimulants or exciting medicines. We advise him to use the water after it has, either *partially* or *entirely*, parted with its gas, that is, after it has been set by for twelve or eighteen hours, as the delicacy and excitability of his system demand.

The following extract of a letter from Charles Keen, Esq., so happily represents the different effects we daily witness, from the use of the water in its ungas-

ous state, that we insert it in elucidation of our own views.

“DEAR SIR,—When I first came to the springs I commenced using the water *fresh at the fountain*, but was compelled to discontinue it, in consequence of its *stimulating effects upon my system*; producing at the same time, *headach, dryness and burning in the skin, with constipation of the bowels*. I then had recourse to it, brought to my room in an open vessel, and let it remain until its gas had partly escaped, before I drank it. The use of it in this way *produced the most desirable results*, and in a reasonable time did much to restore me to health, having been previously afflicted with disease of the liver and stomach, with a symptomatic affection of the lungs.

CHARLES KEEN.

In cases of inflammation of the *parenchyma* of the brain, and in other highly excitable conditions of the cerebral or nervous system, we have the water more carefully prepared, either by heating or freezing it. We have a case at this time under treatment, in the person of Mrs. F., in which there is such an extreme susceptibility of the brain, that absolute derangement for several hours was the consequence, in several instances, of taking two glasses of the water fresh from the spring; although she bears with impunity, and is improving rapidly, under *prepared* water.

In graduating the amount of stimulus, or if the gase-

ous theorist please, the amount of medical material to the wants of the system—in other words, varying our prescription, to suit the case, are we departing from a scientific and approved system of practice? What would be thought of the science of a medical man, who invariably used, either the same medicine, or, the same dose of any medicine, without regard to the peculiarities or constitution of his patients? Just what ought to be thought of us, or any one else, who would direct so potent an agent as white sulphur water to be used alike in every variety of constitution and disease.

A popular error, in relation to mineral waters, is that they exert a sort of mysterious influence on the system;—and that, as nature has elaborated them in the bowels of the earth, they are, therefore, formed in the best possible manner for the cure of disease. This opinion is not more reasonable than it would be to suppose that nature has formed *antimony* in the best possible form, for the cure of disease, although we know, that in this form, under the administration of the celebrated Basil Valentine, it slew all the *monks* in his cloister.

Like all other remedial agents, potent mineral waters produce certain *effects* upon the animal economy, and these effects will be beneficial or injurious, as the

remedy is properly or improperly employed. For instance, C., who is nervous, delicate, and excitable,—and is affected with functional derangement of the organs, requires to receive, for a certain time, the influence of a mineral water,—which while it acts as an aperient upon his bowels, enters his circulation,—courses through his system and *alters* his deranged organs; being at the same time so bland and unstimulating in its general effects, as not to arouse any one, or a series of organs into undue excitement and rebellion against the common good. Such a remedy is found in the *stale* and *ungaseous* white sulphur water.

D. requires the very same effects to be exerted upon his diseased organs,—but he is of very different temperament and constitution. His brain and nerves are prone to no unnatural excitement, and he is unaffected with the thousand physical sensibilities to which C. is subject. D. may take the white sulphur water with impunity and advantage, in any manner most agreeable to him. In his case its exciting gas constitutes no objection to its use. The good effects of the water, so differently used by C. and D. will be the same, *because the difference in their cases makes the difference in the use of the remedy.*

Having, as we trust, made our “theory” and the principles of our practice, as relates to the white sul-

phur water, intelligible to every reader, we recur to the arguments of Mr. Burke designed to overthrow our opinions: and if we do not succeed in showing the absurdity of his several positions, then will we have fallen far short of the opportunity which he presents for doing so.

(Mr. Burke, page 113.) "We have already shown that, in mere saline matter, the white sulphur is immeasurably below Saratoga; and hence the conclusion is inevitable, according to Dr. M., that Saratoga is immeasurably superior to the white sulphur. Nay, it is known to Dr. M. that the white is below the salt sulphur in saline matter; and does he therefore imply that the former is superior to the latter? Would he directly concede this? No: yet it is plainly deducible from his theory. But the absurdity of the proposition is self-evident, when the reader reflects that, if true, the great white sulphur water is no better than may be made by any apothecary's apprentice behind his counter."

Now we ask any individual who has read even the *horn book* of medicine: nay, we appeal to the common sense of every individual to say, how the fact that the Saratoga is immeasurably superior to the white sulphur in the amount of its saline matter, can prove that it is immeasurably superior as a medicinal agent;

when not only the different saline matters of the two waters are totally dissimilar, but relative proportions of such as they hold in common are totally and entirely different. Yet Mr. B. assures his readers that such a conclusion is plainly deducible from our "theory." Our author must pardon us, for really such a proposition, embodied in a book that purports to be *semi-medical* at least, is too futile for sober criticism. He had quite as well tell us that an ounce of table salt must be immeasurably superior to ten grains of calomel, because it contains a great deal more solid matter, forgetting that there is no similarity whatever in the solid matter of the two.

The same reasoning that proves the futility of his proposition, as relates to the Saratoga, is applicable to the salt sulphur, because the salts in the two waters are not the same, nor are their relative proportions or combinations the same.

"But," says Mr. B. "the absurdity of the proposition is self-evident, when the reader reflects that, if true, the great white sulphur is no better than may be made by any apothecary's apprentice behind his counter." We have certainly no disposition to have a discussion with Mr. B. on *logic*, yet for the life of us we cannot see how the fact, (admitting it to be so,) that white sulphur water could conveniently be

manufactured, would render the absurdity of our theory "self-evident." We will presently show how self-evident it is, upon Mr. Burke's own premises, that his *gaseous* theory is absurd; and how exceedingly precarious is the value of his Red Sulphur Springs under such theory.

But first: Is it true, admitting the correctness of our theory, (even as improperly represented by Mr. B.) that "every apothecary's apprentice" may make white sulphur water? This idea is a favourite with our author. At page 107 he says, if our "theory" be true, it renders the white sulphur water "liable to be successfully imitated by any one who can mix, with common water, the different portions of saline matter discovered by its analysis." And in a letter to us of the 26th July, 1841, he says: "If your theory be correct, as soon as the relative quantities of the different saline ingredients are discovered, every soda shop in the United States can successfully rival the great white sulphur." Now, in justice to Mr. Burke's intelligence, of which we make a respectable estimate, we are unwilling to suppose that he is so uninformed in the history of chemical manipulations, as not to know that the utmost perfection to which that science has progressed, has hitherto been insufficient to enable chemists to *analyse and recombine* mineral waters.

Does he not know that the ablest chemists have again and again attempted, but in vain, "successfully to imitate" the mineral waters of Europe? If he be familiar with these facts—and he speaks of chemistry as a very familiar thing—it is marvellous enough that he should assert, without qualification, that an apothecary's apprentice could do that which a Lavoisier and a Sir Humphrey Davy never could have accomplished.

But if Mr. B's. "apothecary's apprentice" could overcome this difficulty in chemistry, and actually succeed in combining all the *known* salts of the white sulphur water, what would he do with that very material substance, abundantly found in the water called by the chemists "*organic matter*"—a substance peculiar to the water itself, and not even having a name in chemical nomenclature? Here is surely a difficulty which neither the "apprentice" nor he of the "soda shop" could surmount.

It is plainly deducible, from all that Mr. B. has written on the subject, that *he* attributes the efficacy of sulphur waters *mainly*, if not *entirely*, to their sulphuretted hydrogen gas.

In his letter to us, before noticed, he says, *the Red Sulphur* "is ALTOGETHER a gaseous water, containing scarcely an appreciable quantity of saline matter."

Now, as sulphuretted hydrogen gas can very conveniently be made, even by the "apothecary's apprentice behind his counter," it follows, as an inevitable conclusion, from his own premises as applied to us, that *his* theory is "self-evidently absurd." Not only so; "every soda shop in the United States can successfully rival" the Red Sulphur Springs. Will Mr. Burke admit this? We presume not; and yet the conclusion is inevitable from his premises.

To show the unprofessional reader, how easy it is to *manufacture sulphuretted hydrogen gas*, and consequently, how easy it would be, agreeably to Mr. B.'s theory, and his express declaration as to the "**ALTOGETHER gaseous character**" of his own water, to have a red sulphur fountain in every neighbourhood in which there might be a case to demand its use, we annex the following receipt for making sulphuretted hydrogen gas, which we copy from a standard work on chemistry:

"To obtain *sulphuretted hydrogen gas*, melt together, in a crucible, three parts, by weight, of iron filings and one of sulphur; reduce the mass to powder, and put it with a little water into a glass vessel with two mouths; lute one end of a crooked glass tube into one of these mouths, and let the extremity of the tube pass under a glass in a pneumatic trough,

the jar being inverted and full of water. Then pour diluted muriatic acid through the other mouth of the vessel, which must immediately be closed up. *Sulphuretted hydrogen gas* will now be disengaged in abundance, and flow into the glass jar, displacing the water."

"Recently boiled water," says Turner in his Chemistry, "absorbs its own volume of sulphuretted hydrogen, and *acquires* the peculiar *taste* and *odour* of sulphurous springs."

Will Mr. B. favour the public with a *recipe* equally simple, and equally in the power of the keeper of the "soda shop," and of the "apothecary's apprentice," for combining the *saline ingredients* that abound in the white sulphur water?

Our readers will now see from whose theory, Mr. Burke's or our's, sulphur springs are in the greater danger of being "successfully imitated."

Mr. Burke proceeds, page 114: "But we will prove to a demonstration, that the positions taken by Dr. M. are in direct opposition to all experience, and to the discoveries of science. Dr. M. says it is generally admitted that the 'medicinal properties of the white sulphur water reside mainly in its solid contents.'" Now, we assert that no such thing is admitted; but just the contrary.

After an annunciation like the above, every reader of Mr. B.'s book would expect to meet with some stern, well ascertained, and generally admitted facts, so directly opposed to our "theory" as to demolish it in toto; or, at least, with some clear, close, and appropriate reasoning, so convincing to the understanding, as to amount to a *probable demonstration*. But what must be his surprise, on reading further, to find that Mr. B.'s "demonstration" has no direct reference to the subject under discussion;—and would not approximate to a demonstration if it had. His "demonstration" is this, and nothing more;—that Professor Hare, in speaking of sulphuretted hydrogen, said, that the "celebrated sulphur springs of Virginia, are indebted for their *odour* and *mainly* for their efficacy, to this compound;" which he informs us is composed of "one atom of hydrogen and one atom of sulphur." Now, let it be borne in mind that Professor Hare was not speaking of the White Sulphur Springs, especially, when he made this declaration. We know, indeed, that that distinguished gentleman has never chemically examined that water; if he had, we would entertain great confidence in the results of his chemical investigations;—but still he would be bound to prefer the *experience* of the physician to the *theoretical opinion* of the chemist. It is the business

of the latter to ascertain the chemical qualities of a substance,—and of the former to ascertain its medical powers and applicability.

Professor *Wm. B. Rodgers*, of the University of Virginia, who has devoted much time to the investigation of this, and other mineral waters, in the State, and who must be admitted to be the best chemical authority upon the subject, says, in a letter addressed to us in 1838, “Though I am disposed to ascribe some of the efficacy of the water to the sulphuretted hydrogen, I believe that the *saline ingredients* have a *large share* in the production of its remedial effects.” Again, in a letter to *Wm. B. Calwell, Esq.*, in 1839, which is now before us, Professor *Rodgers* makes the following remarks:

“I have found, by an examination of the water, after having been kept in a closely sealed bottle for three years, that no alteration had occurred in its saline ingredients, and but a small portion of its gaseous matter had escaped;—and further, it is my impression, that by bottling and transportation, its medicinal value will not be impaired. *I am not inclined to ascribe much power to the* GASES IN ANY OF OUR SPRINGS.

Now, we do not claim that the declaration of Professor *Rodgers*, that he is “not inclined to ascribe

much power to the gases in any of our mineral springs," amounts to a "demonstration" of the correctness of our theory; but it surely does amount to high testimony in proof of its correctness, and effectually neutralizes Mr. B.'s "demonstration," so called.

But we have not yet done with this subject. Let us for a moment look into the reasonableness of our ascribing medicinal efficiency to the saline matter of mineral waters, and inquire what the most distinguished physicians have thought on this subject.

Why should it be thought "unscientific," or unreasonable to believe that the medicinal virtues of the white sulphur water reside *mainly* in its saline contents? or, that these contents should be actively *alterative*? The analysis of the water shows it to be composed of several of the more active alteratives of the *Materia Medica*; and this alone would seem to settle the question of its alterative power. To what medicine, next to mercury, do we look as the most certain alterative? In the mineral kingdom, to *iodine* certainly;—this we have in the white sulphur water. Sulphur too, is a powerful alterative. This we have in the form of *precipitated* sulphur. We have also its combinations in the active forms of sulphate of lime, sulph. magnesia, sulph. soda, and sulph. hyd.

sodium. We, also, there find various carbonates and chlorides, all more or less alterative in their character. These alterative salts exist in the water in the most minute form of subdivision that can be conceived, or, in other words, in solution;—they are absorbed into the mass of the circulation, course through the whole system, applying themselves as appropriate agents to diseased organs and tissues.

Professor *Mütter*, of Philadelphia, when speaking of the different ingredients of mineral waters, says, “It is generally admitted, I believe, that when absorbed and conveyed through the economy, they have the property of changing the consistence as well as the composition of our fluids, thereby accomplishing what is called an *alterative action*.”

Dr. *John Bell*, confessedly the standard authority in the United States, on such subjects, in his admirable work on “Baths and Mineral Waters,” bears the following emphatic testimony to the virtues of the saline ingredients in mineral waters. “When taken into the stomach or intestines (mineral waters) have a double operation, the one common, and generally uniform, depending on their basis, or their pure watery vehicle; the other proper and peculiar, *being the effect of their saline or mineral substances held in solution*.” The same author continues to remark,

“that the small proportion of foreign ingredients in mineral waters, compared with the quantity of the same substances prescribed in medical practice, has created surprise in the minds of some, and incredulity in others, at the alleged efficacy of the former, when the latter, in so much larger doses, has been attended with comparatively trifling results. In reply to this it is only necessary to remind my readers of a few tolerably familiar principles in physiology and therapeutics. First, we know that the action of many remedial agents, chiefly of the stimulant and narcotic tribes, is primarily and almost exclusively exerted on the stomach, and by sympathy on the rest of the system. Solids, vegetable and metallic, in small bulk, and taken without much dilution, are nearly equally local, in their first effects, with the additional application to the surface of the intestines, but in either case their action is diffused by the same law of sympathy. In the second place, as the whole mucous surface of the stomach and intestines has this great sensibility to the impression of ingesta of every kind, especially those of a remedial nature, it is very obvious that the sensations produced by these means will be active, and their diffusion through the system by nervous agency or sympathy prompt and general, in proportion to the extent of the surface acted on. Now,

mineral waters taken usually in considerable quantity, so as to fill the stomach, and pass promptly into the intestines, are so applied to these parts, as to enable their *saline* and *metallic* ingredients to act on almost the entire surface of the digestive tube, and of course to produce all the effects which we could desire from such ingredients; effects not to be expected from them, even though in larger quantities, when applied but to a few points, or limited extent of surface. Finally, the experiments of late years have most satisfactorily established the fact of the *absorption* of various substances, nutritious and medicinal, and above all, fluids, by the veins of the stomach and intestines, as well as by the lacteals, without, in many cases, those substances losing their distinctive character:—nay, further, that the peculiar and specific action and effects of the various agents, are as operative when injected into the veins as when taken into the stomach.

It is then hardly necessary, after such preliminaries, to draw the inference in which most readers will have anticipated me; namely, that the absorption of the mineral water, drunk in large quantities, must be prompt and abundant,—and consequently that the *different ingredients of which the fluid was the menstruum, being thus thrown into the circulation, will produce varied and decisive results, such as could*

not be expected from any other mode of administration."

Dr. Bell, after laying down the positions we have just quoted, makes this additional reflection upon the subject, which we most heartily commend to such as form hasty theories and opinions, as to the virtues of mineral waters; and we will add, as to the virtues of the *different ingredients* of mineral waters, "*that it is only by multiplied facts, that is, by experience of its use, that we can speak positively of its virtues.*"

Had the "Proprietor of the Red Sulphur" such experience in the use of the white sulphur water? Had he any experience at all in its use, when he boldly stepped forward to assert positions which, as we have now abundantly shown, are clearly and triumphantly refuted by the standard authorities upon the subject?

But if any should think proper to dissent from the distinguished gentlemen just quoted, and to regard the saline ingredients as inefficient, while all power is ascribed to the gas; we would respectfully ask such, how we are to account for the efficacy of the numerous *saline* and other waters which contain no sulphuretted hydrogen gas, and many of them no gas at all different from common water? How, upon this exclusive gaseous theory, are we to account for the

celebrity of the Seidlitz, in Bohemia, or Cheltenham, Tumberge, Brighton, or Bath, in England, or Harrodsburg or Saratoga in the United States?

To contend that the saline ingredients of a mineral water may not be *alterative*, especially a water so rich in alterative salts as the white sulphur, is to close the eyes against the most obvious truths, and to disallow and repudiate well established principles in medical philosophy. Hence, it will be seen that it is Mr. Burke's theory, not our's, that is in "direct opposition to all experience and the discoveries of science."

But Mr. B. denies that it has been generally admitted, that the "medicinal properties of the white sulphur water reside *mainly* in its solid contents." We re-affirm the proposition, and deny that it can be shown from facts, and not by mere assertion, that "just the contrary" is admitted. We certainly have never seen any thing written on the relative virtues of the gaseous and saline contents of this water, until the appearance of Mr. Burke's book, that did not, either directly or by inference, concede the controlling influence to its solid contents; and if Mr. B. had examined the testimony on this subject contained in our pamphlet, which was in his hands, he would scarcely have hazarded so direct a negative to our assertion.

(Mr. Burke continues, page 115,) "But Dr. M.

asserts that sulphuretted hydrogen is a *nervine stimulant*. We beg leave to quote Dr. Armstrong on this subject."

Mr. B.'s readers will feel surprised on perusing his quotation from Dr. Armstrong, which immediately follows the above annunciation, and occupies four pages of his book, not to find a single sentiment or syllable in reference to sulphuretted hydrogen as a nervine stimulant. Why, therefore, Mr. B. stated the question, and referred to Dr. Armstrong in connexion with it, we are at a loss to know.

But does Mr. B. mean to assert that sulphuretted hydrogen gas is not a stimulant? Such is evidently his intention, but he does not venture upon the proof. We assert that it is a stimulant, and an *active nervine stimulant*, and the fact that it is so is well known to every individual of nervous susceptibility, who has used sulphur water abounding in this gas. Who, thus circumstanced, has not experienced from its use, headach and general nervous excitement, followed often by drowsiness, such as we witness from an opiate?

Turner, in his Chemistry, now the text-book in some of our medical schools, makes the following remarks upon the qualities of sulphuretted hydrogen gas: (page 244.) "Sulphuretted hydrogen is very in-

jurious to animal life. According to the experiments of Dupuytren and Thenard, the presence of 1.1500th of sulphuretted hydrogen in air, is instantly fatal to a small bird; 1.800th killed a middle sized dog, and a horse died in an atmosphere which contained 1,150th of its volume." The sulphuretted hydrogen in the White Sulphur Spring is speedily fatal to all animals when immersed in the water, even for a short time; frogs survive but a few moments after being put in the spring; fish, in two minutes after their immersion in the water, manifest entire derangement, with great distress, and uniformly die in less than three minutes. These fatal effects of this article are the results, we are aware, of inhaling it into the lungs, and not of its reception into the stomach; but must there not be an *active* and, consequently, a *stimulating* effect in the operation of an agent so potent in its influences? We consider sulphuretted hydrogen gas as unquestionably a nervine stimulant as opium: but we know, that like opium, it sometimes produces secondary effects upon the economy which are relatively sedative. But because opium produces those secondary effects, do we come to the conclusion that opium is not a stimulant? We could do so with the same propriety that we can urge that sulphuretted hydrogen gas is not a stimulant.

(Mr. Burke continues, page 118,) "Whilst he (Dr. M.) asserts that the water is as good, nay, better, without its gas, he tells us that it is the gas alone which imparts to the white sulphur water its sulphuric smell and taste. He (Dr. M.) recognizes the presence of sulphur in no other form in the water—he acknowledges that the gas escapes wholly by exposure to the air, and yet he recommends as sulphur water, that which is no more the same article it once was, than any plain well water that may be obtained in the same geological district."

Here is a tissue, so broadly and so palpably misrepresenting our opinions, and so obviously calculated to mislead in relation thereto, that we cannot pass it over without correction. Now we never have asserted, as a *general principle*, that the white sulphur water is "better" without its gas. We believe it better only in such cases as we have heretofore designated in this review. We do assert that it is the "*gas alone*" which imparts to the water its *sulphuric smell and taste*. Does Mr. B. mean to deny this? With the slightest acquaintance with the subject, we are persuaded he will not do so. But, says Mr. B., we recognize "the presence of sulphur in no other form in the water." Now is this really true, that we "*do not recognize the presence of sulphur in any other*

form in the water," but in that of its gas? Let our recorded sentiments speak on this subject. In our pamphlet, from which Mr. B. quotes our opinions upon other subjects, is to be seen, standing out in bold relief, the following *analysis* of the white sulphur water by Professor Rodgers, and which we publish in that pamphlet as the authority upon which we rely.

(Pamphlet, page 10.) "The solid matter procured by evaporation of 100 cubic inches of the white sulphur water, when dried at 212°, weighs 63.35 grains. This consists of

<i>Sulphate of Lime,</i>	Chloride of Calcium,
<i>Sulphate of Magnesia,</i>	Per Oxyde of Iron,
<i>Sulphate of Soda,</i>	Phosphate of Lime,
Carbonate of Lime,	Sulph. Hydrate of Sodium,
Carbonate of Magnesia,	Organic Matter,
Chloride of Magnesium,	PRECIPITATED SULPHUR,
Chloride of Sodium,	Iodine.

The gaseous matter consist of
 Sulphuretted Hydrogen, Nitrogen,
 Carbonic Acid, Oxygen.

Here it will be perceived, that in addition to the

sulphuretted gas, three different sulphates, and PRECIPITATED sulphur itself is "recognized."

If the above exhibit of testimony, so direct and conclusive, convicts Mr. B. of misrepresenting our opinions upon this important subject, than his *classic* allusion to the "half loaf" which immediately follows, must fall to the ground, and his candour as an annotator fall with it.

Requiescat in pace.

Mr. Burke concludes his review of our opinions by noticing in the following most extraordinary manner, the *testimony* which we exhibited in proof of the correctness of *our* "theory." The necessity of getting clear of the force of that testimony before he could shake the firmness of our positions, was clearly perceived by him: and as he could not assail the respectability of the gentlemen testifying, he very modestly attempts to do away their testimony by asserting that they did not understand the subject on which they were testifying: that they did not know the difference between two plain English words: that forsooth they had mistaken *aperient* for alterative. Hear him!

(Mr. Burke, page 119.) "Before we quit this subject, we desire to say a word respecting the certifi-

cates given by gentlemen, many of whom we know and respect, to Dr. Moorman. They no doubt believed what they stated to be correct. They meant to state that the *aperient* quality of the water was not impaired by the loss of its gas, but probably increased, in which we perfectly agree with them: but those of them who have used the word *alterative*, have probably used it as synonymous with mildly purgative, and have therefore said more than they intended."

Intelligent, literary gentlemen, several of them physicians of high character, "meant to state" the opposite of what they did state! Can our author be in sober earnest in making such a declaration in relation to such gentlemen? And does he for a moment suppose that the public will accord to him a better understanding of what these gentlemen "meant to state," than they possessed themselves? But it is passing strange that any doubts should have lingered in the mind of our author as to what was "meant to be stated," after reading the following paragraph which occurs in Dr. Johnston's* letter, which constitutes a portion of the testimony which he had under review:—"Its course of action, says Dr. Johnston, at the Springs each summer was as follows:—A few glasses before breakfast

* See Dr. Johnston's letter published entire in pamphlet, p. 6.

always acted freely on the BOWELS; before dinner, and at night, when I always drank it freely, its action was that of a diuretic,—a tonic and ALTERATIVE action were *plainly* and *sensibly felt*, although of course not so sensibly exhibited. *When I resumed the use of the water in November, precisely the same results obtained, following the same order.*”

Here, it will be perceived, this intelligent physician draws a clear line of distinction between the action of the water upon the *bowels* and its *alterative* action, leaving not even a loop upon which to hang a doubt as relates to what he “meant to state.”

Mr. B., in the paragraph just quoted from his book, *fully admits the fact*, that the *APERIENT* quality of the white sulphur water is *increased* by the loss of its gas. This is an important admission on the part of the “Proprietor of the Red.” For many years *we* have contended for the increase of the *aperient* quality of this water after its gas has escaped: this opinion, with us, is the result of long and careful observation: the public are now convinced of its correctness, and Mr. B. is only keeping pace with public sentiment by his admissions on the subject. In making this admission, however, he virtually makes another, which we suppose he did not design to do, namely, that the practice of using the *ungaseous* water must, now and then

at least, be correct, because the *purgative* quality of the water is thereby increased.

Upon this admission of Mr. B. a very natural and interesting question arises: why is the water more *aperient* after it has parted with its gas? We allege that this arises chiefly from the fact that the gas in question is a *nervine stimulant*, and to some extent a soporific; and that, in virtue of these influences, it delays the purgative action of the water.

If a better explanation can be given of this interesting fact, so fully admitted by our author, we will be pleased to receive it, as we earnestly desire in investigating the character of the water, to arrive at correct conclusions from correct premises.

We have thus concluded all that we have thought necessary to say in relation to Mr. Burke's attack upon us as a man and a physician;—an attack as unprovoked as it was illiberal and unjust.

Our regret at being compelled to enter the arena of controversy has been lessened, from the fact that it has afforded us an opportunity of spreading before the public our reasons for a pathological or discriminating use of a valuable medicinal agent.

In performing a duty that was made incumbent upon us, we have confined ourselves strictly to the limits of defence; and we are now content to submit

to an intelligent and impartial public the merits of this controversy.

From a sense of delicacy growing out of our connexion with the White Sulphur Springs, and not feeling that we are the peculiar guardian of mineral waters, or of those who visit them, as Mr. B. seems to believe he is, we have been restrained from controverting his peculiar notions of the *modus operandi* and specific effects of the *red sulphur water*. What *he* has said upon these subjects is now the common property of the public; and of its merits or demerits we leave the public to form their own opinion. For ourselves, we have done with the whole subject, perhaps for ever, for we have as little fondness, as we have leisure or talent, for controversial writing.

The preceding reviews of a portion of a work by William Burke, on the "Mineral Springs of Western Virginia," was published in the spring of 1843.

In the summer of 1846, three years thereafter, a second edition of Mr. Burke's book was issued by his publishers—in which he adds a long article *purporting* to be a review of our notice of his book.

In the first edition of this work, Mr. B. sets forth, and attempts to maintain a number of propositions *chemical* and *practical* in reference to the White Sulphur Water. These propositions were designed to

overthrow opinions previously advanced by us in our writings upon the same subjects:—at the same time he also took occasion to ascribe to us opinions which we never held, and motives by which we were never actuated.

In the preceding review of Mr. Burke's attack upon us and our "theory;" the reader will perceive that we joined issue with him, upon the entire matter of his attack—upon each and every part of it;—and that with the view of doing him over handed justice, and of enabling the readers of our review, to understand the opinions of our opponent, and the arguments by which he offered to sustain these opinions, we quoted largely and fairly from his publication, and in such connected manner, as to give him the full advantage of all that he urged. We then met each of his *propositions* in the order in which they were set forth—and by *facts* and arguments attempted to prove:—and we humbly conceive, *did prove*, that he was in error in all the positions he took in reference to the nature and effects of the White Sulphur Water, and,—that he had perpetrated injustice towards us in his assault upon our motives.

These *propositions* of Mr. B's. were deemed so important to the public, as to induce him to give these a prominent place in the body of his work:—and so much importance does he still attach to the subject to which

they refer, that he has caused it to occupy thirty additional pages in his second edition.—But strange to say, in not *one* line of these thirty pages, has he attempted either by facts or sober argument to rescue his *propositions* from the unfortunate attitude in which they were placed by our review.

He devotes the thirty pages of his notice of our pamphlet,—first, long, though garbled quotations from a CHAPTER “*On the relative virtues of the saline and gaseous contents of the White Sulphur Water,*” which was written with no reference whatever to his notice of our “theory,” but was introduced, appropriately as we conceive, as a *preliminary chapter* to our review of his opinions.

From this “preliminary chapter,” Mr. Burke quotes just so much as—*separated from its context*, seems to him to authorize the ascription of an opinion to us which we never held or expressed, and which the *context* to his quotations *most positively* shows. The remainder of the thirty pages is devoted to an attempt to show himself clever at satirical composition,—and in lieu of facts or arguments to sustain his propositions so confidently urged in his *first edition*, he resorts to “bagatelle,” and not unaptly winds up by the introduction of a FARCE, as an appropriate

afterpiece, we suppose, to the TRAGEDY of the death of *his own favourite propositions*.

Although Mr. B's. notice of our "preliminary chapter" is unfair, and unwarranted in many respects, we will notice but a single instance, and this only because the public may possibly have some concern in it. We allude to his constant and persevering effort to fix upon the mind of his readers, that we, in the administration of the White Sulphur Water, prefer "*stale water to fresh*;" such an opinion we have never either entertained or expressed as an independent proposition; nor without a qualification as to the peculiar state of the system in which it has a preference. This is a *stale* and favourite charge of Mr. B. against us, and made without the slightest foundation in fact:—nay in opposition to the clearest proof of its incorrectness. We ask the public to judge of this matter not by the *assertion* of a man whose prejudices render him incapable of doing us justice; but, by what we have uniformly written on the subject,—and especially by the authority—the "preliminary chapter" alluded to, from which Mr. B. purports to derive our opinions.

We have not "*chuckled*" as Mr. B. asserts, because he had not, or could not answer our review of his propositions:—nor do we now *chuckle* at his admitted

inability to do so. So far as chemical or professional truth is thus given to the ascendancy over error, we have a legitimate cause of gratification; and to this feeling we are not insensible.

By abandoning, even an attempt to sustain his propositions heretofore in controversy between us—and by his manifest effort to divest public attention from them by a resort to personal vituperation and sarcasm, Mr. Burke has virtually yielded all for which we have contended—and all for which we are disposed to contend with him.

We would be acting in violation of our own sense of self respect; and as we believe, of the public respect, to turn aside from sober professional pursuits, in which the public may possibly have some interest,—to engage in a mere personal sarcastic warfare and “bandying epithets” with any man. Our judgment,—as well as the instincts of our taste forbids such a course in any case—and especially in the present: when to do so, would be to play directly into the hand of our opponent, who desired nothing so much as to withdraw public attention entirely from the actual issues between us, by merging the whole matter into a mere personal melee of coarse crimination and recrimination.

In this new field of contest now proposed, and oc-

cupied by our opponent, we leave him "solitary and alone" to claim, and to reap all the laurels which such a field can afford. He, having virtually yielded the only matters in controversy between us in which the public can feel the slightest interest:—we, in return, most willingly yield to him an undisputed occupancy of the new theatre of his selection;—unmatched,

To play the part his taste assigns him.

REMARKS.

WE have thought that it would be interesting to many of our readers to have a condensed view of all the different mineral springs, situated in the "Spring Region" of Virginia, with the analysis of each, so far as it can be furnished. We regret that the limits which we had prescribed for this little volume, will not permit us to enter a more extended account, at least, of the peculiar characteristics and virtues of each of these springs:—they are all rich in objects of special inquiry, and as therapeutical agents, eminently worthy the attention of the medical profession, and of the public generally.

The first part of the document
 discusses the general principles
 of the system and the
 various methods of
 application. It is
 intended to provide a
 comprehensive overview
 of the subject matter
 and to serve as a
 guide for the reader.

The second part of the document
 contains a detailed description
 of the various methods of
 application. It is intended
 to provide a comprehensive
 overview of the subject matter
 and to serve as a guide for
 the reader. The methods
 described are intended to be
 applied in a systematic
 and organized manner.

The third part of the document
 contains a list of references
 and a bibliography. It is
 intended to provide a
 comprehensive overview of
 the subject matter and to
 serve as a guide for the
 reader. The references are
 intended to be applied in a
 systematic and organized
 manner.

BLUE SULPHUR SPRING.

THIS spring is situated in a narrow, but beautifully picturesque valley, twenty-two miles west from the White Sulphur, on Muddy Creek, a small tributary of Greenbriar River. The place is pleasantly and tastefully improved,—having comfortable accommodations for about three hundred visitors. It is now much resorted to during the watering season, and has already acquired a high character, not only for the medicinal virtues of its waters,—but also for its neat and comfortable accommodations. The property belongs to a joint stock company, and was first opened under their auspices in the summer of 1834.

The analysis of this water, by Professor Rodgers, shows it to be composed of the following ingredients:—

Solid Ingredients.

Sulphate of lime,

Sulphate of magnesia,

Sulphate of soda,
Carbonate of lime,
Carbonate of magnesia,
Chloride of magnesium,
Chloride of sodium,
Chloride of calcium,
Hydro-sulphate of sodium and magnesium,
Oxide of iron, existing as proto-sulphate,
Iodine,
Sulphur,
Organic matters.

Gaseous Ingredients.

Sulphuretted hydrogen,
Carbonic acid,
Oxygen,
Nitrogen.

The Blue Sulphur is successfully used for the various diseases for which other sulphur waters are administered,—and is believed to be superior to many others in certain forms of female afflictions connected with obstructions.

The spring is a very bold one, yielding about 15

gallons of water to a minute. It abounds in purple, black, and white deposits from the water.

Considered as a remedial agent,—or as a comfortable and pleasant summer retreat, this watering place offers very high inducements to the seekers of health and the votaries of pleasure.

SALT SULPHUR SPRINGS.

THESE springs, three in number, are about twenty-four miles south from the White Sulphur, in the county of Monroe, and near Union, the seat of justice for that county. They are encircled by mountains on every side,—having Peters' Mountain to the south and east,—the Allegheny to the north, and Swopes' Mountain to the west, near the base of which are the three springs alluded to.

This watering place has been a popular and profitable resort for invalids for the last forty years;—having always heretofore, as now, enjoyed a high reputation alike for the virtue of its waters and the excellence of its accommodations. It is owned by Messrs. Erskine & Caruthers,—worthy and enterprising proprietors, under whose personal management the establishment has been for many years, and who made the principal improvements at the place— which are both comfortable and extensive; being suffi-

cient for the accommodation of three hundred and fifty persons.

The "*Salt Sulphur*" proper, was discovered by Erwin Benson, Esq., in 1805, when boring for salt water, which he was induced to believe might be found there, from the fact, that, in *old times*, the spot had been a favourite "Lick" for deer and buffalo. This spring is neatly enclosed in a marble reservoir, two feet square, and about two feet ten inches deep,—and is protected from the weather by a neat and comfortable edifice.

The following is the *analysis* of this water as furnished by Professor Rodgers:—

Temperature variable from 49° to 56°.

Solid matter procured, by evaporation, from 100 cubic inches, weighed, after being dried at 212°, 81.41 grains.

Quantity of each solid ingredient in 100 cubic inches, estimated as perfectly free from water:—

1. Sulphate of lime,	. . .	36.755 grains.
2. Sulphate of magnesia,	. . .	7.883 "
3. Sulphate of soda,	. . .	9.682 "
4. Carbonate of lime,	. . .	4.445 "
5. Carbonate of magnesia,	. . .	1.434 "

6. Chloride of magnesium,	0.116 grains.
7. Chloride of sodium,	0.683 “
8. Chloride of calcium,	0.025 “
9. Peroxide of iron, from proto- sulphate,	0.042 “
10. An azotized organic matter, blended with sulphur, about,	4 “
11. Earthy phosphates,	a trace.
12. Iodine.	

Volume of each of the gases contained in a free state in 100 cubic inches:—

Sulphuretted hydrogen, 1.10 to 1.50 cubic inches.	
Nitrogen,	2.05 “
Oxygen,	0.27 “
Carbonic acid,	5.75 “

The above analysis applies to the Iodine, or New Spring, as well as to the Upper, or Old Spring, as the following extract of a letter, from Professor Rodgers to the Proprietors, will show:—

“I enclose you a list of the ingredients in the salt sulphur water, which applies to the New as well as to the Old Spring, the former having rather a smaller

amount of saline matter in general, though in some ingredients surpassing the other. It has been very minutely analyzed, and is the first of all the waters in which I was enabled to detect traces of iodine, which it contains in larger amount than the Old Spring, and, indeed, most of the other waters in which I have been so fortunate as to discover this material."

The *Iodine*, or *New Spring*, was accidentally discovered by the proprietors in 1838, while engaged in opening a drain for the water of the "Salt,"—and was immediately deepened and enclosed in a marble reservoir, and covered by an appropriate building. Owing to a large deposit of sulphur in combination with some peculiar organic matter, which floats as a pellicle upon the surface of the spring, this water is less limpid than that of the "Salt." Under an intense heat of the sun, it occasionally deposits a beautiful pink sediment upon the bottom and sides of the reservoir. In taste and smell, it much resembles the water of the other springs, but being *ten degrees* warmer, is less palatable to some persons. Its temperature varies from 62° to 68° Fah.

The presence of a larger quantity of iodine in this spring, *points* it out as a superior agent in many affections for which iodine is successfully employed, par-

ticularly in scrofula, goitre, and some diseases of the skin.

The Upper, or *Old Spring*, was discovered in 1803, by Alexander Hutcherson, Esq., who was searching for salt water on Indian Creek. It soon came into high reputation as a mineral water, and was the annual resort of a large company. The house now occupied as a hotel, and several of the old cabins, were erected at that early day. The water of this spring is now almost exclusively used for the baths: the opening of the *Salt Sulphur* proper, whose waters are more strongly marked, having in a great degree superseded it as a drink.

We are indebted to Dr. Mütter's pamphlet on the Salt Sulphur for many of our facts in relation to this establishment: and shall still further avail ourself of it, in noticing the various diseases to which these waters are applicable.

Professor Mütter judiciously remarks that the Salt Sulphur being a stimulant, should not be employed in acute or highly inflammatory affections; nor in those in which there exists much active determination of blood to the head—at least until such determination has been lessened by previous diet, purgation, and if necessary, blood-letting. But in chronic affections of the brain, in neuralgia and nervous diseases gene-

rally:—in some affections of the chest, particularly such as are brought on from the retrocession of some habitual discharge:—in chronic affections of the kidneys and bladder; in rheumatism and gout, and in many diseases of the skin, it is among the most valuable of our remedial agents. The same may be said of its value in *mercurial sequelæ*,—in hæmorrhoidal affections, and in some of the chronic diseases of the womb.

In the various and multiform diseases affecting the abdominal viscera,—such as hepatitis, jaundice, gastritis, pyrosis, dyspepsia and some forms of diarrhœa, the Salt Sulphur is one of the most valuable of our remedial agents.

The result of our own observations for many years, leads us to entertain a very high opinion of the salt sulphur water in dyspepsia,—and particularly in cases connected with obstinate costiveness.

RED SULPHUR SPRINGS.

THE Red Sulphur Springs are in the Southern part of the county of Monroe, forty-two miles south from the White Sulphur. They are distant seventeen miles from the Salt, thirty-two miles from the Sweet, and thirty-nine miles from the Blue Sulphur.

This spring has been known and distinguished as a watering place, for upwards of forty years. The improvements at the place are extensive and well designed, combining elegance with comfort:—having been greatly enlarged and beautified within the last fifteen years, by the former proprietor, Mr. Burke. The establishment now affords comfortable accommodations for 350 persons.

The water of the spring is clear and cool:—its temperature being 54° Fahrenheit.

The following is Professor Rodger's analysis of the water of this spring:

“Gaseous contents in an imperial gallon:—

Sulphuretted hydrogen,	4.54	cubic inches.
Carbonic acid,	8.75	“
Nitrogen,	4.25	“

“Solid contents of 32 cubic inches of water, gr. 1.25, consisting of sulphate of soda, lime and magnesia, carbonate of lime and muriate of soda.

“Besides these ingredients, the water contains, in considerable quantity, a peculiar organic substance, which, mingled with sulphur, is deposited on the sides of the spring, and seems to increase by a species of organic growth.”

The Red Sulphur is the least stimulating of our sulphur waters,—and by some is even regarded as a sedative. It is employed with good effect in many cases for which our other sulphur waters are prescribed,—and being less exciting than any other, may be successfully used in some cases in which other waters would be contra-indicated.

The peculiar and distinguishing reputation of this water, however, as a medicinal agent, is for diseases of the thoracic viscera,—and by many it is considered remedial in confirmed consumption. Without affirming or controverting this high claim of the Red Sulphur as a remedy in *confirmed consumption*, our ob-

servations enable us to accord to it decided efficacy in some cases of irritation of the pulmonary organs. In sympathetic, or translated affections of the lungs, whether that state be occasioned from disease of the digestive or chyleopatic viscera, or be dependent upon the retrocession of some habitual discharge, this water deserves to be regarded as a valuable remedy.

SWEET SPRINGS.

THE Sweet Springs are situated in a wide and beautiful valley in the eastern extremity of Monroe county. They are seventeen miles south-east from the White Sulphur, and twenty-two from the Salt Sulphur.

These springs were discovered in 1764, before any of the other mineral waters in this section of the State were known. In 1774, they were analyzed by Bishop Madison, then President of William and Mary College.

These springs are justly celebrated for the tonic power of their waters, used either internally or externally.

“The water of the spring (Bell,) rises into a large cylindrical reservoir, from opposite sides of which it flows out by small pipes: one conveying water to the bath for the men, the other to that for the ladies. The men’s bath is of a quadrangular form, surrounded

by a wall, and open at the top. It is of tolerable extent and clear—the bottom being of gravel, and the water constantly flowing in and as constantly passing out, after it reaches a certain height.

“The temperature of the Sweet Spring is 73° Fah., the same as that which, in England, by a strange blunder, is called Bristol Hot Well. There is considerable resemblance between the two in other respects, as well in the evolution of carbonic acid, as in the earthy and saline matters held in solution. In the Virginia Spring, however, iron has been detected, whereas the Bristol Hot Well has none in its composition.

“By the analysis of Rowelle, one quart of the Sweet Spring water contains:—

Saline substances in general, 12 to 15 grains.

Earthy substances, . . . 18 to 24 “

Iron, $\frac{1}{2}$ to 1 grain.

“The saline substances are, sulphate of magnesia, muriate of soda, and muriate of lime, with a little sulphate of lime. The earthy matters consist of sulphate of lime, a small portion of carbonate of magnesia and lime, with a small portion of silicious earth.”

Few mineral waters have acquired such fashion-

able and well merited celebrity as the Sweet Springs. The name is calculated to convey erroneous impressions of their taste, which is like a solution of a small quantity of a calcareous or magnesian carbonate. The excess of carbonic acid gives, however, the water a briskness, productive of a very different effect on the palate from what an imperfect mixture of the earths would produce.

The first effects of this water, due to its temperature and gaseous contents, when drunk, are a feeling of warmth at the stomach, with a sensation of fullness of the head, and some giddiness. Taken at stated intervals in moderate quantity, it will produce a moisture on the skin, and increase the flow of urine. If the stomach be in a good state, it gives additional appetite, and imparts fresh vigour to the system. Its operations on the bowels vary at first, but after a more protracted use, it will generally be found to increase a costive habit.

The sweet spring water is serviceable in the varieties of dyspepsia accompanied by gastrodynia or spasm, with pains occurring at irregular intervals, and heart burn—where the extremities are cold and the skin torpid. In secondary debility of the digestive canal, from the exhausting heats of summer, or in chronic diarrhœa and dysentery without fever, or not

sustained by hepatic inflammation, much good will be produced by the internal use of these waters.

If much gastric irritation, or evident phogosis of the liver be present, with a parched skin and other phenomena of fever; it will be better to premise one or two small bleedings, followed by the use of a blue pill at night, and a tumbler-ful or two of the water, to which has been added a tea-spoonful of Epsom salts, or twice the quantity of calcined magnesia, early in the morning.

The harassing cough to which young persons are occasionally subject, and which often has its origin in an enfeebled state of the stomach, or in scrofulous habits from the enlargement of the bronchial glands—as also the *tussis humoralis* of old people, will all be materially benefitted by the use of these waters. The relief afforded in such cases as these, has usually given Bristol Hot Well its reputation in the cure of pulmonary consumption.

As we should have inferred from the excess of carbonic acid, and the presence of earthy carbonates in the water; it is useful in calculous and nephritic complaints.

The use of the bath at the Sweet Springs, is adapted to a large number of cases. The first sensation on immersion in the water is a slight shock, after which

the feeling of cooling is refreshing and rather agreeable.

The freedom and advantage with which the bath at the Sweet Springs, has been used by aged persons is evidence of its general safety. The chief points to be attended to are, that the skin should not be moist or cold with perspiration, nor that there shall be general chill, nor the languor that follows excessive muscular action:—the stomach also should be nearly empty, or, at least, not actively engaged in its work of digestion.” The duration of the bath is usually too long, from two to fifteen minutes will embrace periods adapted to every condition, and only the most robust should remain in the last mentioned time. It is often found advantageous to use the bath twice or thrice during the day.

SWEET CHALYBEATE SPRING.

THE *Sweet Chalybeate*, or Red Spring, is situated in the county of Allegheny, one mile west from the "Sweet Springs." The improvements at this place are spacious and comfortable, and are sufficient for the accommodation of 150 persons. The proprietor of the property, is proceeding with spirit still further to beautify and adorn a position to which nature has been unusually liberal in her gifts. There are two springs at this establishment, the one near the Hotel essentially the same, both in temperature and quality, with the Sweet Springs:—the other in many respects like it, but containing a larger quantity of iron, which being abundantly deposited about the spring in the form of a red precipitate, has given it the name of Red Spring.

According to Rowelle, one quart of the Red Spring water contains:—

Carbonate of lime, . . .	4 grains.
Carbonate of magnesia, . .	3 "
Carbonate of iron, . . .	2 "
Silex,	1 "
Sulphate of magnesia, . .	1 "
Muriate of soda,	$\frac{1}{2}$ "
Iron combined,	1 "
Carbonic acid,	

The following is the result of an analysis by Professor Rogers of this water:

1st. Solid matter procured by evaporation from 100 cubic inches, weighed after being greatly dried at 112° 40.76.

A portion of this is combined water.

2d. Quantity of each solid ingredient estimated as perfectly free from water. In 100 cubic inches:—

Sulphate of lime,	14.233
Sulphate of magnesia, . .	3.107
Sulphate of soda,	1.400
Carbonate of lime,	1.166
Chloride of sodium	0.037
Chloride of magnesium, . .	0.680
Chloride of calcium, . . .	0.010
Susquioxide of iron, . . .	0.320

Organic matter in small quantities.

Iodine, a mere trace.

The iron is no doubt dissolved in the water as a carbonate.

3d. Volume of each of the gases contained in a free state, in 100 cubic inches of the water.

Carbonic acid,	. . .	46.10	cubic inches.
Nitrogen,	. . .	2.57	"
Oxygen,	. . .	20	"
Sulphuretted hydrogen, a trace,			
too small to be measured.			

4th. Composition of 100 cubic inches of the mixed gases rising in bubbles in the spring:—

Nitrogen,	62.5
Carbonic acid,	37.5

The temperature of the red spring water as it issues from three different heads, is from 77° to 80° Fah. The water is conveyed into a comfortable and commodious plunge bath at a short distance from its source.

The waters of the Sweet Chalybeate are used for the same diseases for which the waters of the Sweet

Springs are prescribed. They are a delightful and efficient tonic, and are now deservedly attracting a large share of public attention. The writer has great cause to speak favourably of this water. In the summer of 1842, he spent several weeks here, availing himself of the use of the sweet chalybeate internally and externally, for a sciatic *neuralgia*, under the painful effects of which he had been prostrated for several months. To describe the great relief which he derived, would demand the language of enthusiasm. The effects were as remarkable as they were prompt and happy. In a word, he found in this water an effectual remedy for this protein and painful disease, after all other remedies had failed.

HOT SPRINGS.

THIS celebrated bathing establishment is situated in the county of Bath, thirty-five miles north-east from the White Sulphur, and immediately on the great thoroughfare from the capital of the State to the Ohio river. It is owned by Dr. Goode, who resides on the premises, and personally directs in its management. Comfortable bathing houses have been erected for the accommodation both of male and female patients. In each of these houses suitable arrangements are made for taking the *Sweet* or *Plunge* bath, as may be desired;—or, for receiving the *Douche* when it may be required.

“There are six baths at this place, (Dr. Goode,) each supplied with water from a separate spring; they range in temperature from 98° to 106° of heat. The effects of these waters in disease prove that they are highly medicated, though they are considered by many as simple hot water. They are known to con-

tain sulphate and carbonate of lime, sulphate of soda and magnesia, a minute portion of muriate of iron, carbonic acid gas, nitrogen gas, and a trace of sulphuretted hydrogen gas; and when used internally, the consequences are such as we might expect from our knowledge of some of their constituent parts.

“But the chemical composition of a mineral water can lead to no safe conclusions as to its medical powers. Its most potent part may be incapable of analysis, or destroyed by the process; and its mere properties cannot be developed by analysis; our only sure test is experience of the actual result when applied to the *diseased* human system. I have been at the Hot Springs for six entire seasons, and have watched their effects on several thousand invalids with all the interest which ownership could excite; and the result of my experience is as follows:—These waters taken internally, are anti-acid, mildly aperient, and freely diuretic and diaphoretic. But when used as a general bath, their effects are great and excel all expectation. They equalize an unbalanced circulation, and thereby restore the different important parts of the system when torpid—that natural and peculiar sensibility, upon the existence of which their capacity to perform their several functions, and the beneficial action of all remedies depend; they relax contracted

tendons, excite the action of the absorbent system, promote glandular secretion, exert a marked and salutary influence over the whole biliary system, and often relieve, in a short time, excruciating pain caused by palpable and long standing disease of some vital organ."

The Hot Springs constitute a popular and very valuable remedy, in a large circle of interesting and important cases—many in which they have been successfully employed, are detailed in a small pamphlet published by Dr. Goode, by reference to which much information upon the subject may be obtained.

These waters have been analysed by Professor Rogers; but we have only been able to obtain a mere *list* of their ingredients, viz :

Carbonate of lime,
Sulphate of lime,
Sulphate of soda,
Sulphate of magnesia,
Carbonate of magnesia,
Carbonate of iron.

The free gas is Nitrogen—the combined gases are Oxygen and Carbonic acid.

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WARM SPRINGS.

TRAVELLING five miles East from the Hot Springs, you reach the Warm Springs. They are at the seat of justice for the county of Bath.

The Warm Springs are among the most ancient of our watering places. The temperature of the water is 98° Fahrenheit—perfectly transparent and as buoyant as the sea. There are well arranged and commodious houses for bathing, both for males and females.

“ Many tales are related by the older inhabitants of this part of the country, of the discovery and use made of these waters by the Indians, which are probably, in part, fabulous, but it is well ascertained that soon after the discovery of them by civilized man, they became celebrated for their curative qualities, in various diseases, as well as for the luxury of bathing; that they were frequented at much labour and fatigue by great multitudes, before any other, than the Sweet

Springs, of the valuable watering places in Western Virginia, was known."

For the *general* effects of the warm bath on numerous cases of disease, we may refer to the work of Dr. Bell, "on Baths and Mineral Waters." He enumerates the following diseases in which the warm bath from 95° to 98°, will exert a curative agency, viz. "acute pain, with irregular and convulsive action of the muscles; convulsions of children and hysterical affections of females; mania and mental derangement generally; bilious cholera; infantile cholera and cholera morbus; chronic diarrhœa; croup; catarrh; bronchitis, in chronic form; asthma; organic affections of the heart; chronic affections of the liver; nephritic disorders; amenorrhœa; affections of the skin in various forms; violent cases of gout; chronic rheumatism; suppression of perspiration and pains in the muscles and joints; pains in the limbs following a mercurial course; paralytic affections," &c.—In all these cases the warm bath acts as a powerful auxiliary, to the appropriate remedies prescribed by the physician.

In *dyspepsia* of long standing, there have been some remarkable instances of permanent cure from a daily bath, and half a dozen glasses of water drunk at the fountain, when persisted in for six or seven weeks.

In *chronic rheumatism* and *paralytic* affections, similar effects have been produced by the same course.

Temperature of these medicinal waters affords a gentle stimulus to the surface, and causes it to cast off its impurities, while it disposes the skin to absorb a certain portion of the fluid with the substances held in solution by it. This in itself, is a great benefit to the invalid, while to a person in health, the pleasurable and soothing sensations are excited, particularly when friction is employed on coming out of the bath."

The large bath (Professor Rogers,) is an octagon, 38 feet in diameter; its arena is 1163.77 feet. The ordinary depth being five feet, (it can be increased to six,) the cubic capacity is 5818.86 feet, or 43,533.32 gallons; notwithstanding the *leaks*, this quantity of water will flow into the reservoir in one hour. The average temperature of the bath is 98° Fah. The gas which rises in the bath consists of nitrogen; with minute quantities of sulphuretted hydrogen and carbonic acid.

Besides this gas, each gallon of water contains 4.5 cubic inches of gas, consisting of—

Nitrogen, . . .	3.25	cubic inches.
Sulphuretted hydrogen,	0.25	“
Carbonic acid, . . .	1.00	“

The saline contents of one gallon of the water are as follows:—

Muriate of lime,	3.968
Sulphate of magnesia (Epsom salts),	9.984
Carbonate of lime,	4.288
Sulphate of lime,	5.466
And a trace of soda,	0.000
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	23.706

The Warm Springs are owned by Dr. Brockenborough. Ample and excellent accommodations exist here for a large company,—and the sojourner in our mountains will find it an agreeable as well as useful place to spend a portion of his time.

DIBRELL'S SPRING.

DIBRELL'S SPRING is in the county of Botetourt, and immediately on the stage road from the Natural Bridge to the White Sulphur, nineteen miles from the former and forty-four from the latter place.

The accommodations here are sufficiently extensive for from 150 to 200 persons—and are exceedingly neat and comfortable. The following analysis of this water has been rendered by Professor Rogers:—

Solid Ingredients.

Carbonate of soda,
Sulphate of soda,
Chloride of sodium,
Carbonate of magnesia,
Peroxide of iron,
Silicia dissolved.

Organic matter, containing chloride of potassium, nitrogen, carbonate of lime, and carbonate of ammonia.

Gaseous Ingredients.

Carbonic acid,
Oxygen,
Sulphuretted hydrogen,
Nitrogen.

The water of Dibrell's Spring partakes of all the general characteristics of our other *sulphur waters*: and may be used with good effects, in all cases to which such waters are adapted. In certain dyspeptic depravities especially, it deserves a high rank among our mineral waters.

The property is owned by Messrs. Watkins & Hatcher, and is under the immediate control and management of the latter gentleman.

ALUM SPRINGS.

THESE springs are situated in the county of Rock-bridge, on the main road from Lexington to the Warm Springs, seventeen miles from the former, and twenty from the latter.

It has been but a few years since the public attention was called to the value of these waters: and the very high estimation in which they are now held, is strong evidence of their value. They possess unequivocal medical powers, and are destined to advance still further in the public confidence.

They are well adapted to many diseases of the skin, and glandular system,—and in scrofulous affections particularly, they offer new hopes to the afflicted.

The amount of observation and experience with them in different diseases, is too limited as yet, to enable us to decide either as to their positive value, or relative superiority, in a large class of cases in which sulphur waters are profitably employed. Each of

these remedies doubtless has its appropriate sphere. But enough is known of the salutary operations of the Alum Water, to point it out as an exceedingly valuable agent.

Desiring to acquire particular information in reference to the therapeutical character of these waters which I could not command by my own observation, I requested my friend, Dr. McPheeters of Natchez, than whom, there is none more competent, to furnish the result of his observations and experience with them. The following letter from this eminent physician, will not fail to be interesting and useful to the public.

ALUM SPRINGS VA., SEPT. 26th, 1844.

Dear Sir:—It is with considerable reluctance that I comply with your request, that I should give you a *written* account of my experience, of the medical virtues of the waters of this place. First, because my opportunities of observation have been very limited. Secondly, on account of a great natural disinclination to have to appear before the public. On the other hand, so very little has been published of the very important therapeutical qualities of the Virginia Springs, that it is perhaps the duty of every observer to contribute his mite, however small.

In order that you, and the public may know what degree of importance to attach to my remarks, I will observe that I have been here but two seasons. I spent about three weeks here in September, 1840, and about five weeks in August and September of this year. As I have had no opportunity of ascertaining their chemical composition, I will confine my remarks to their therapeutical effects, as manifested under my own observation. In their general effects on the system, they are a febrifuge tonic. In their effects on the pulse and skin, they more closely resemble the action of the sulphate of quinine, than any other article of the *materia medica*, that I have met with; producing a full slow pulse, and warm moist skin. By their astringent and tonic qualities, they diminish internal congestions, and give a centrifugal tendency to the fluids, thereby filling the superficial veins and capillaries. They are more uniformly and powerfully diuretic than any waters I have met with. They act as moderately purgative in one half, or perhaps two-thirds of the visitors. In what may be termed neuralgic dyspepsia, they change the action of the mucous membrane—relieve it of the sub-acute inflammation under which it labours, and powerfully promotes the appetite and the powers of digestion—and at the same time relieves these intermittent pains, and distressing

nervous sensations, that so generally accompany that form of dyspepsia.

They very promptly relieve uterine hemorrhage of the passive description. They speedily cure leucorrhœa even when it has been a complaint of years' standing. They relieve some cases of hæmorrhoides very promptly. They cause the absorption of scrofulous tumours, and promote the healing of indolent ulcers. The powders prepared by evaporating the water given in 3 or 4 grains three times a day, in half a drachm of the aromatic syrup of rhubarb, promptly relieves the summer complaint of children (produced by hot weather and teething) when unattended by fever. In doses from 5 to 15 grains, three times a day, they relieve weak digestion and strengthen the system in children and adults.

The common opinion (which I believe is correct) is, that the upper spring is most purgative and alterative—the middle one most astringent, and the lower one most tonic—and that the strength of all of them is materially increased by wet weather.

With these hasty remarks,

I remain, very respectfully,

Your obedient servant,

H. M·PHEETERS, M.D.

To J. J. MOORMAN, M.D.

The water of these springs was analyzed by Professor Rogers in the course of his Geological Survey of the State, but has never been made public.

Since the foregoing was written, and in the month of December, 1846, the whole of the buildings for the accommodation of company at the Alum Springs were burnt by the accidental catching of fire in one of the rooms of the family residence. In addition to the heavy loss which this misfortune brings upon the worthy proprietors of the property, it may be regarded as a public calamity. Energetic efforts will doubtless be made for the speedy erection of other buildings suitable for the accommodation of those who may wish to visit the place; and it is to be hoped that it will very soon be crowded, as it has heretofore been, with the seekers of health and pleasure, who annually resort to the mountains of Virginia.

RAWLEY'S SPRING.

RAWLEY'S SPRING is situated on the southern slope of the north mountain, in the county of Rockingham, twelve miles north-west from Harrisonburg, and about one hundred and twenty miles north-east from the White Sulphur.

The Rawley water is a strong and pure *chalybeate*, and well adapted to cases requiring such a tonic.

The writer has had some personal experience in the use of this water; and for many years has been in the habit of occasionally directing its use in cases to which it is applicable. As a pure iron tonic, it deserves to stand at the very head of that class of remedies.

In that class of female affections, dependent upon debility, or want of tone in the uterine system, this water is an exceedingly valuable remedy. Its salutary effects in cases of this description are often as remarkable as they are gratifying;—restoring the func-

tions of the debilitated organ, and imparting vigour and health to the whole system.

No analysis of this water has been made public.

The accommodations at Rawley's are not extensive; perhaps sufficient for one hundred and fifty persons.

THE
VARIOUS ROUTES
TO THE
VIRGINIA SPRINGS.

THE various routes to the spring region of Virginia, have all been greatly improved within the last few years. Either by private or public conveyance, persons can now reach our mountains with far greater ease, safety and expedition than they could have done some years ago.

Taking Baltimore *as a starting point*; the Virginia springs may be reached by a variety of routes. One of the most pleasant, and as expeditious as any other, is by *rail-road* to Harper's Ferry, thence to Winchester by a similar conveyance, and from thence by stage-coach, on a good McAdamized road to Staunton.

From Staunton the traveller may proceed directly across the *North* and *Warm Spring* Mountains to the Warm and Hot Springs;—or, he may proceed up the valley by the way of Lexington—the Natural Bridge and Dibrell's Springs to the White Sulphur.

By this Valley route, the traveller has the advantage of seeing Harper's Ferry, and the romantic meeting of the waters of the Potomac and Shanandoah: to see which, Mr. Jefferson said was "worth a voyage across the Atlantic;" he travels almost the whole length of the Shanandóah valley; in agricultural points of view, decidedly the most fertile and interesting portion of Virginia. He passes within seven miles of the famous *Wier's Cave*, and may conveniently visit it by losing one day in his travel; and last, though not least, he may pass over the celebrated *Natural Bridge*, with an allowance of time, if he be in a public conveyance, to take a glimpse at its magnificent structure.

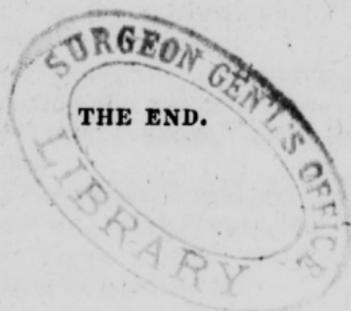
Another route from Baltimore, is to proceed by the way of Washington and Fredericksburg to Richmond—or, from Baltimore you may reach Richmond by steamboat, down the Chesapeake Bay, by the way of Norfolk and up James' River. From Richmond to the springs, you have choice of two routes:—either to take a canal-boat one hundred and fifty miles to Lynchburg, and from thence by stages to the springs;

or, to take the Rail-road to Gordon'sville eighty-five miles, and thence by way of Charlottesville and Waynesborough to Staunton. When the traveller is at Lynchburg, he has again the choice of routes,—he may proceed by stage, by the way of Liberty, Fincastle and Sweet Springs, to the White Sulphur: or by a similar conveyance he may go by way of the Natural Bridge and Debrill's Springs to the White Sulphur. The distance from Lynchburg to the White Sulphur, is the same on both these routes, being just one hundred miles.

The several routes making Richmond a point, gives to the traveller an opportunity of seeing the metropolis of the State, and the University of Virginia, situated near the flourishing village of Charlottesville. In common with the "Valley Route," it extends to the traveller an opportunity of seeing the Natural Bridge without delaying his journey.

The western and south-western traveller to the Virginia Springs, has but little choice of routes. The usual way of reaching them from those quarters, is to disembark from a steamboat at Guyandotte, and proceed by stage coaches into the Spring Region. The Blue Sulphur is reached in one hundred and thirty-eight miles from Guyandotte, the White Sulphur in

one hundred and sixty. Travellers sometimes take the Kanhawa boats at Louisville or Cincinnati, and proceed up the Kanhawa river to Charleston, where they take the stage; the former route, however, commands a general preference.



The history of the United States is a story of growth and expansion. From a small collection of colonies on the eastern coast, it grew into a vast nation that stretched across the continent. The early years were marked by struggle and conflict, as the colonies fought for their independence from British rule. The American Revolution was a turning point in the nation's history, leading to the birth of a new republic.

The United States has a long and rich history, with many important events and figures. The nation's growth was fueled by westward expansion, as settlers moved into new territories and states. The American Civil War was a defining moment in the nation's history, as it fought to preserve the Union and end slavery. The Civil War led to the Reconstruction era, which sought to rebuild the South and integrate African Americans into the nation.

The United States has also been a leader in the world, playing a key role in the development of the modern world. The nation's economic power and military strength have made it a superpower. The United States has been instrumental in the creation of the United Nations and other international organizations. The nation's values of freedom, democracy, and equality have inspired people around the world.

The history of the United States is a story of resilience and achievement. Despite many challenges and setbacks, the nation has persevered and grown into a great power. The United States continues to play a leading role in the world, and its history will continue to be studied and admired for generations to come.

ERRATA.

- In Address to the Public, page v, line 15, for "it is with reluctance," read, it *was* with reluctance, &c.
- Page 37, line 22, for "*but* while," read, *that* while, &c.
- 59, 1, for "rules which originally," read, rules which *ordinarily*, &c.
- 74, 18, for "remaining," read *running*, &c.
- 74, 19, for "giving one," read giving *any* one, &c.
- 77, 15, for "and for these," read, and for *those*, &c.
- 79, 1, for "suffer much," read, suffer *most*, &c.
- 85, 16, for "this efficiency," read, *its* efficiency, &c.
- 85, 22, for "greivously are," read greivously *err*, &c.
- 88, 23, for "consummate," read *consume*, &c.
- 90, 1, for "diet of the dyspeptic," read, diet *for* the dyspeptic, &c.
- 92, 6, for "among the number arise," read, among the number *are*, &c.
- 92, 16, for "to the medical shop," read, *of* the medical shop, &c.
- 99, 18, for "rendering a valuable," read, rendering *it* a valuable, &c.
- 113, 6, for "this I know," read, this *we* know, &c.
- 171, 16, for "reviews," read, *review*, &c.
- 171, 23, for "this work," read, *his* work, &c.
- 172, 10, for "over handed justice," read, *even handed* justice, &c.
- 172, 24, for "give these," read, give *them*, &c.
- 173, 8, for "first long," read, first *to* long, &c.
- 175, 2, for "given to the ascendancy," read, given the ascendancy, &c.
- 175, 7, for "divest public attention," read *divert* public attention.
- 175, 21, for "who desired," read, who *desires*, &c.
- 177, 7, for "enter a more extended," read, enter *into* a more extended, &c.

The above errors occurred in consequence of the absence of the Author preventing his reading the proofs.