OBSERVATIONS

MADE DURING A VISIT TO THE

CLARENDON SPRINGS, VT.,

IN RELATION TO THEIR

CHARACTER AND PROPERTIES,

IN A PART OF

JULY AND AUGUST, 1839.

WITH AN

ANALYSIS OF THE WATERS.

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CLARENDON SPRINGS.

As these Springs have never been a subject of history, a little notice of the descriptive kind may not be amiss. They are situated in the north-western part of the town of Clarendon, seven miles south-west from the court-house in Rutland (the shire town of Rutland County); ten miles south-easterly from the village of Castleton, in the same County; twenty-three miles east from Whitehall, N. Y., and sixty miles north-east from Saratoga Springs;—and from all these towns the place is accessible, during the watering season, by a daily stage. It is surrounded by some of the richest, most picturesque and beautiful scenery of the Green Mountains of Vermont. The waters issue from the west side of a hill, of about two hundred feet elevation, at points varying from five to fifteen feet above the ordinary level of a beautiful stream, (into which they fall), designated, on the map of Vermont, as "Little West River," which runs northerly, along the base of the hill, about two rods west of the Springs, and discharges itself, a few miles below, into Otter Creek. The scenery in the vicinage of the Springs might be called picturesque and delightful, rather than romantic and sublime.

The buildings are situated on the west side of the rivulet, on a dry soil, but moderately elevated above the stream. The "Clarendon House," built by the proprietors for the accommodation of visiters, has a beautiful and commanding location, with its outbuildings. It was finished the last season, and is conducted by Col. M'Laughlin and Lady, with much decorum and propriety, and

would not suffer by a comparison with almost any establishment of the kind in the northern States. About one hundred visiters may be accommodated at this House, and it is contemplated to enlarge the establishment by another season, so as to accommodate one hundred and fifty. The daily entries now on the house journal average seventeen visiters.—There are two or three other convenient and respectable houses of accommodation near by, and one or two are to go into operation another season. It has been estimated that between four and five hundred visiters may find easy accommodations in the neighborhood of the Springs.

A few rods north of the Springs stands the Bathing-House, for cold and warm bathing ; the spring waters being heated by steam. For the convenience of exercise, there is a swing and bowling-alley.

The springs in use at present are three, the largest of which is the high spring. The proprietors have erected an abasement of stone around this spring, of about twelve feet by eighteen, with an elevation on the lower side, of four feet. In nearly the centre of this, is a reservoir of four feet by six, protected by dark marble slabs on every side, so that the crystal water is about two feet deep. The bottom is covered with pebbles, between the interstices of which continually arise from the bottom to the surface of the water, a succession of gas bubbles. They arise in a silent manner, varying in size from half to an eighth of an inch in diameter. From thirty to fifty of these bubbles may be seen rising at the same time. It is asserted that these springs are scarcely affected by a drought, or by excessive rains. The water flowing from this high spring might require a tube of about one and three-fourths of an inch in diameter to transmit it off without much pressure.

One of the lower springs issues in a conduit at about ten feet from the south corner of the abasement,—being a comparatively small spring,—and the water is taken for use by a spout, into a pitcher.

The north lower spring issues at about the same distance from the abasement, and is of about the same size.

There is considerable deposit of calcareous substance around the springs, denominated tufa.

On the 4th of August, we ascertained the temperature of the waters to be, with Fahrenheit's thermometer, as follows :—

High Spring, at the depth of two feet,	48 deg.
Both lower Springs,	54 "

making a difference of six degrees. This is supposed to arise from these springs running some little distance nearer the surface of the earth. The difference may vary at other seasons. Mr. Hayes inferred from his analysis, that they originated from one source.

Some time past, several bottles of these waters, and also of the gases, were taken by Mr. Edgerton, the principal proprietor of the establishment, well sealed, and transmitted to Roxbury, Mass., for analysis, by Mr. Hayes, an accurate chemist residing there. The following are the results of his investigations :

EXTRACT OF A LETTER FROM MR. AUGUSTUS A. HAYES, OF ROXBURY, MASS., GIVING THE RESULTS OF THE ANALYSIS OF THE WATERS OF THE CLARENDON SPRINGS.

"I am now enabled to state the accurate results of chemical analysis made of the waters of the Clarendon Springs. Although unexpected delay has occasioned impatience on my part, it was thought better to lose in time, rather than arrive at false conclusions respecting so important a matter. The unusual purity of the water proves an obstacle in the way of analysis. The waters of the low and high springs are derived from the same source, as their saline constituents shew ;—slight differences, due to different exposures, may be observed in their actions on the human system, while chemically they are the same. When submitted to the refined operations of modern analysis, they yield precisely $\frac{1}{10,000}$ of saline matter, being in fact more pure than river waters. Their curative powers are derived from their aerial constituents, which are remarkable. One gallon (standard of 1770) contains, of the gas called carbonic acid, 46.16 cubic inches, and of the gas called nitrogen, or azote, 9.63 cubic inches, besides variable proportions of atmospheric air. The analysis of mineral waters from limestone countries, have generally given a much larger proportion of carbonic acid, and little or no nitrogen. These waters must of

course be classed with the acidulous, and they approach, in composition and character, most closely to the German Spa water, which has been highly celebrated for cutaneous affections. In relation to the qualities of these waters for medical purposes, it is not possible to decide from chemical investigations. Abundant evidence of another kind in favor of them, you have already received in the statements of those who have been cured; and the chemist can only say, that the presence of the two gases above named, in a state of solution in the waters, renders them remarkable for composition, and that they offer, as interesting subjects for medical observation, many characters of unusual occurrence. The physicians in Boston who are best acquainted with mineral waters, cannot express an opinion decidedly in regard to the action of such waters on the system, for the reason that they differ somewhat, in composition, from any heretofore known.

"Expressed in the usual form, the composition of these waters is as follows:—

One United States gallon, being 235 cubic inches, of these waters, contains of nitrogen gas, or azote, 9.63 cub. inches.

Carbonic acid gas,		46.16 " "
Besides atmospheric air.		
Saline matter,		5.76 grs. consisting of
Carbonate of lime,	3.02	
Muriate of lime, sulphate of soda, and sulphate of magnesia,	2.74	

The gas which is evolved from these waters was analyzed—it contains in 100 cubic inches,

Carbonic acid gas,	0.50
Oxygen gas,	1.05
Nitrogen gas,	98.45
	100

"The tufa, which is deposited by the waters, consists almost entirely of carbonate of lime—some pieces give traces of oxide of iron and carbonate of magnesia."

Mr. Hayes having ascertained from his analysis that these waters yield only "$\frac{1}{10,000}$ part of saline matter; being in fact more pure than river waters," it seemed desirable to ascertain their relative weight, compared with certain other waters. Accordingly, on the 30th of July, the following trial was carefully made, in the presence of several persons. The different waters had stood four hours in the same room, in order to acquire nearly the same temperature; that of the atmosphere being about 90° Fahrenheit. A thin flint phial was procured, which held a fraction over nine ounces, and carefully balanced, and then filled, a cork being fitted and inserted to a given point in every trial, so that its lower end just pressed on the water. We considered this made the measure of the water exact. The results of the several gravities, by an accurate beam, were as follows:

Clarendon lower spring water,	9 oz.	11 grs.
Clear rain water,	9	15
River water, from Little West River,	9	16
Saratoga Congress water, after standing 16 days, in a bottle well corked, still sparkling,	9	20

The Clarendon waters never, in a visible manner, part with their gases after being taken from the springs, but seem to hold their due proportions in combination, for some time, at least, or, according to modern chemists, in solution. How long these gases may be so retained, I believe has never been shown;—whilst it is evident the Saratoga waters are prone to part with their carbonic acid gas and become vapid, and by many thought to become nearly useless. Not having an analysis of these waters at hand, we cannot say how much gas they may hold in permanent solution. It is supposed the less gas held in solution, with a like proportion of saline substances, will increase their relative gravities, when tried by measure.

Mr. Hayes well considers the Clarendon waters as "remarkable for composition;"—and also, that "they differ somewhat in composition from any heretofore known." We may perhaps, then, infer that their sanative powers may also be *remarkable.*—

Many instances of their extraordinary influence in altering and removing certain conditions of disease, go far to support such an inference. Their sanative properties most probably consist in the gases they contain, with their peculiar proportions and combinations ;—for the mineral substances held in solution are seemingly too inconsiderable to become efficient on the human system, being only one ten-thousandth part. The waters can scarcely be said to be directly tonic : yet, by removing the obstacles to health in the circulations, they promote digestion and prove invigorating in their effects.

Whilst the sanative powers of most other springs have been esteemed as essentially depending on the mineral saline substances they contain, we now possess very good evidence to show that the same habits of disease have been cured by these waters almost destitute of such mineral substances, and effected more quickly and more safely. The testimony is clear and decided, that the Clarendon waters never have done injury, unless by their coldness in some particular habits, and when used too freely.

These waters may be taken in large quantities with impunity ; yet large quantities are not necessary, and generally ought not to be practiced. In ordinary instances, from five to twenty half-pint tumblers may be used during the twenty-four hours, and without proving cathartic, or even laxative; and, indeed, they rather incline to induce a costive habit, which is readily removed by ordinary laxatives. It is asserted by an eye-witness, that one man took in one day 120 tumblers, and another, the same day, 125, without injury.

These being light, gaseous waters, they quickly pass into the circulation by the intestinal mucous tissue, by a process called imbibition, by others, endosmose,—and thence prove to be the most certainly diuretic of any substance yet known, or specified in any Materia Medica. Their operation is, for the most part, silent, yet rapid, and produces extraordinary changes in the functions of minute tissues of the system, both externally and internally, in a few days, when in a diseased state. They sometimes prove diuretic in six hours. Their common effects are, after being taken a day or two, to excite warmth and slight itching on the surface, sometimes attended

with a slight nausea. Their diuretic effects soon appear, and these sensations vanish. Still, however, many feel no such disturbance.

A series of experiments are about being instituted, to ascertain whether these waters suffer deterioration by long keeping in different conditions, and even on exposure to the atmosphere; or, whether certain definite proportions of the two gases they contain act not only as supporting agents to each other, increasing their attachment by affinity to the water, and also, preventing decomposition taking place in their composition. It is asserted by good authority that Dr. Shaw, the elder, kept a barrel of the water a year, in his cellar, without deterioration.

It appears that the waters retain a definite proportion of the carbonic acid gas, and a very small surplusage is suddenly thrown off, when exposed to the atmosphere; whilst another definite proportion of nitrogen gas is retained, and an *immense* surplusage is suddenly dissipated as soon as exposed in like manner. We are induced to infer that the sanative powers of the water depend on the peculiar proportions and combinations of the retained gases. They are, therefore, gaseous waters, and styled acidulous. However, notwithstanding the highly improved state of modern chemistry, there may be present, in gaseous waters especially, certain fugitive affinities and fragile combinations, which are destroyed at the first manipulations, and not liable to be detected. Hence it is, that no medicinal waters have ever been reinstated to their primitive condition by any synthetic processes.

UTILITY OF THE WATERS.

As they contain no sensible properties over those of other simple, pleasant waters, their unobtrusive character seems to have been a great obstacle in their obtaining a reputation of medicinal utility. Incredulity and scepticism have always stood opposed to evidence not well arranged nor properly impressed; and those cures which have been asserted as extraordinary by some, have still been esteemed by many as visionary, or merely accidental occurrences.

It is, moreover, not a little extraordinary, that no vestige of a manuscript, or memoranda of their use, can be found at the present time, as made by either priest, people, or physician. Tradition says, that some fifty years past, a man was cured of bad legs, by accidentally wetting them in the water whilst doing some work on the spot; and, also, that a boy was cured of scald-head, who accidentally got his head wet by the water. It appears that for forty years the people of the immediate vicinity of the springs made frequent and salutary use of the water in salt-rheum, old sores, poisoning by ivy, &c. At length, some thirty years since, Dr. Jonathan Shaw, a physician of well esteemed reputation, settled, and for many years practiced, in the immediate neighborhood of the springs. He early obtained a belief of their utility in many of the maladies incident to human nature, and did much, in an oral manner, to urge their use. The writer well recollects that, sixteen years past, he heard him converse and make high encomiums on their utility in very many diseases. Still, no efficient means were taken to arrest the attention of the public generally. However, public attention had at length become excited by a slow repetition of evidence, which has enforced a conviction of their utility.

The evidence now offered, of the utility of the waters, has suddenly been collected on the spot, and in the course of a few days. This is not inconsiderable: yet only a part of it will be given at the present time. It is partly founded on the declarations of credible persons, and partly from direct observation at this time.

Dr. Shaw, the younger, is now here. Although resident at Mobile, he has occasionally visited the springs for his own benefit. He has seen much in favor of the waters, in a variety of complaints. He says they were esteemed by his father as a sovereign remedy in many affections, especially cutaneous diseases of every appearance; also, that he thought favorably of them in consumption, or the phthisis pulmonalis, in its early stages—and this from many trials. He had found them of great service in scrofula, dropsy, gonorrhæa, dyspepsia, inveterate sore eyes, &c. That the waters act directly and very surely as a diuretic, and are of a harmless nature.

Dr. Harlow has been a resident physician in the vicinity of the springs for three years. He has seen their effects in a great variety of complaints incident to New England, and has witnessed their beneficial effects, more or less, almost uniformly. He has known a few cases in which their beneficial effects have been lost for the present, and some injury incurred, in very weak people, by taking the water too cold, and too freely for their particular conditions. Especially useful in cutaneous and urinary complaints. He has seen their utility in opthalmia, scrofula, rheumatism, gout, dyspepsia, affections of the liver, &c.

Mr. J. W. Edson, now here, aged twenty years, came to the springs three years since; had been diseased six years previous, and affected almost uniformly over his body with a troublesome eruption, appearing in branny scales, chiefly in cold weather. Both his legs largely swollen, skin cracked, issuing an acrid fluid, &c.,—probably the furfuraceous herpes. He bathed but little, but drank freely of the waters; they proved greatly diuretic: he was cured in three weeks. The disease made considerable appearance the next winter; he repeated the remedy, and has since been free from the affection.

Mrs. Hodgman, the hostess of the Union Hall, kept in this place, states the efficacy of the waters used by the boarders in numerous instances, from five years experience. She mentions some instances of lung complaints being benefitted, and particularly a Miss Cutter, who had a bad cough, with expectoration, much emaciation and weakness, &c. The affection was generally called consumption. By a diligent use of the waters, this young woman was restored to apparent sound health, and has remained so.

Mr. D———, from Hardwick, Vt., aged nineteen years, had been at the springs a few days before I arrived. He had been afflicted from childhood with a dry, inflamed skin, liable to crack and afford a serous discharge; chiefly confined to the hands, legs, and some on the region of the stomach. Had some constitutional symptoms, head-ache, &c. His fingers were so swollen when he came, that they could not touch the palms of his hands, nor could he hold a pen. He used the tepid bath, and drank freely. He

says he found some relief in twenty-four hours. In five days he could use his fingers freely, and in a few days more, the ulcerations at the roots of his nails were about healed, and since entirely so. The skin, where the eruption was worst, is as soft as that of an infant. He made no alteration in his diet. Some years past, he used the Saratoga waters for many weeks, found considerable relief, more slowly, but the affection returned the following season with its usual severity.

Mr. Halladay, from Rockingham, aged sixty-five years, came here about the time that I did. Last September, had several cold chills, at different times, with some constitutional disturbance. In the fore part of last winter he began to have swelled legs. At this time they were very large, and an acrid serosity would separate the cuticle in patches as fast as it became regenerated ; so that in one or two days it came off again, the size of a four-pence, or a cent. By the use of the waters externally and internally, he found relief in twenty-four hours. The swelling rapidly disappeared, and in ten days the skin looked smooth, soft and natural, but reddish, like an infant's.

Mr. J. S. Morgan, from New Orleans, arrived here two days before I did, aged 47 years. Had formerly resided in the western part of New York, but went south on account of the coldness of the climate. For sixteen years he had suffered more or less from urinary complaints, by turns very intense, especially on exposure to cold. On asking him what his complaint was, he answered it had always been called the *gravel.* I asked him if he at any time had ever detected any gravel in the vessel, or otherwise. He said No. I then told him that his affection was a very different thing from the gravel,—that it was a complaint incidental to people in cold climates, who were some advanced in life, especially males.

It may not be amiss to make a short digression, to sketch the character of this affection, so frequent in this region, so tormenting, and so generally misapprehended. It consists of an irritative state of the mucous tissue, more or less throughout the urinary apparatus. This tissue becomes turgid, thickened, and assumes a morbid sensibility. It also assumes an eruptive appearance, rath-

er resembling the papular kind on the skin, liable to degenerate into granulations. It sometimes commences near the prostate, and trigone plane of the bladder; sometimes first in the kidneys. It is also of a very persistive character, liable to wear out the subject, especially if forced to use the catheter. No adequate remedy has ever come to the knowledge of the writer; the only resort has been doubtful palliatives.

We now return to the effects of the waters in this case—and are gratified in stating that he found very immediate relief. He says the waters proved diuretic in six hours after first taking, and in no great quantities of the water. He continued daily to experience more and more relief, so that in nine days he felt perfectly well. He tarried at the springs only fifteen days. His visit is too short,—and it will be still more extraordinary if he experiences no return of the affection, after so short a trial.

Perhaps seven-eighths of the urinary complaints in this region are of the character of the above case; yet there are some cases of real gravel, and if we may credit the assertions of those most acquainted with the use of these waters, they have been more or less beneficial in almost every case of the kind.

In conclusion, the writer of these sketches feels no hesitation in saying, from the evidence he has been made acquainted with from many persons of undoubted veracity, as well as what he has already witnessed of the sanative powers of these waters, in connection with their peculiar composition,—that they are very valuable; that they merit the attention, not only of the afflicted, but of scientific men in our country. And, furthermore, considering their safety as well as efficiency, he entertains a belief that their use will be successfully extended to many conditions of disease affecting the internal tissues, in which they have scarcely as yet been tried.

SUGGESTIONS.

Without intending to trespass on the plain historical design we set out upon, or expecting to name all the affections these waters may merit a trial in, we will briefly allude to two only.

The first is, their trial in that destroyer of human life, the phthisis pulmonalis, or consumption. If the views of a large proportion of pathologists are just, in assigning the mucous tissue of the lungs as very often the primary seat of location in this disease; and as it seems pretty manifest that the waters have a congenial influence in this tissue generally, as well as the dermoid, may not a trial of their utility be justifiable,—and especially so in connection with other suitable aids, and at an early period? Mineral springs have rightly been avoided in this disease; but these are not mineral, but gaseous waters.

The other disease is the slow typhoid fevers of this region, and of Europe. It has been amply proved, that ulcerations of the glands and mucous tissue of the large intestines, with diarrhæa, most commonly attend this affection. Besides, these waters are a pleasant diluent, and might carry with them into the general circulation their peculiar properties, which might have sanative influences. A *trial* is all we now suggest.

NOTE,—PAGE 6.

It should be noticed that the *gas* analyzed by Mr. HAYES, was that evolved from the waters *at the reservoir*. There is a slight error in the text. The results obtained from 100 cubic inches were as follows:

Carbonic acid gas, ...	0.05
Oxygen gas, ...	1.05
Nitrogen gas, ...	98.45
	100