

Chateau de César, Cassel, Flanders.

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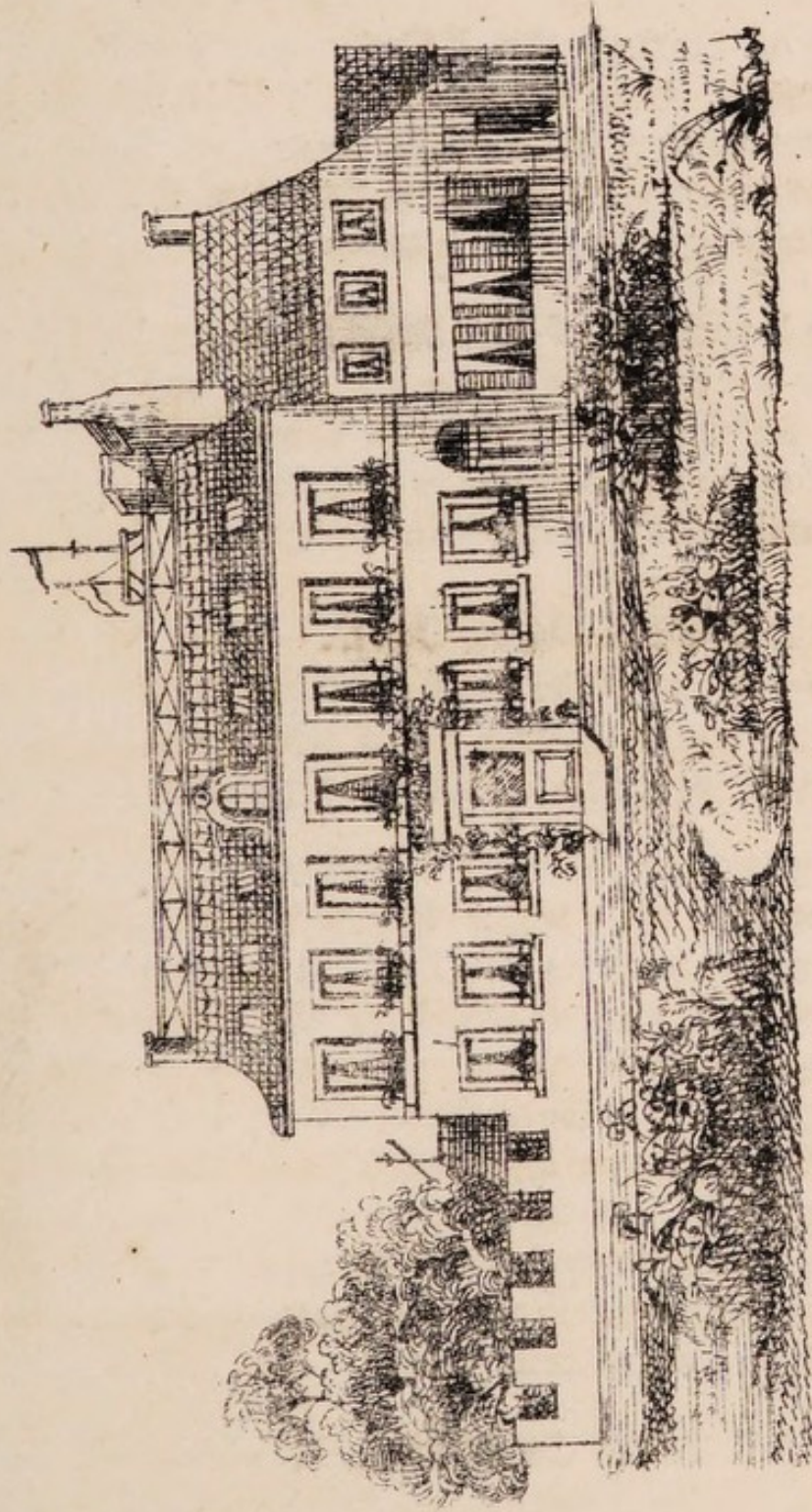
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May 15, 1873.

Château de Cassat,



CASSEL, FLANDERS.

The meals four per day (*Table d'hôte*), will be provided on the most liberal scale, including Claret and Beer.

The Superintendent, an English lady, will personally superintend all arrangements for the comfort and pleasure of the visitors.

Mons. le Docteur Windrif, Associé de l'Institute, will attend daily to give instructions to those who may be advised by their medical attendants, or may desire themselves to drink the waters.

Excursions to the many places of interest in the neighbourhood will be regularly organised, and every effort made to render the stay of the visitors enjoyable as well as beneficial.

TERMS (per week).—Each person, including board at table d'hôte and attendance of Dr. Windrif, £3 3s. Two, £5 5s. Special Terms may be made for any larger number or for children.

It is intended to keep the Chateau open from the 1st of May to the end of September, but should any visitors desire to remain after the season is over, arrangements may be made at a reduced scale. Bills to be paid at the end of each week.

CASSEL may be reached from Charing Cross Station in seven hours, viâ Dover, Calais, and Hazebrouck. By leaving in the morning at 7'40, the Chateau may be reached in time for Luncheon.

The Fare, 1st Class, is about £2, a Return Ticket for a Month to Calais, may be taken for £2 15s.

All applications for further information should be addressed to , DR. PLATT, 21, Adelaide Road North, London, N.W., who may be seen daily at 1 p.m., at the above address.




THE
VALE OF CONWAY
SPA.

ITS NATURE, PROPERTY, AND USES ;
DOSE, MODE OF ADMINISTRATION, AND SEASON ;
ORIGIN, SOURCE, LOCALITY, AND DISCOVERY.

BY
JOHN W. HAYWARD,

M.D., M.R.C.S., L.S.A.

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THE VALE OF CONWAY SPA.

THE water of the sulphur mine near the summit of the mountain *Allt Cae Coch*, not far from Trefriw in the Vale of Conway, has been used externally from time immemorial for the cure of skin diseases, with great success. But for the last thirty years the water of the old mine cutting near the base of the same mountain has quite superseded it, and become recognised as

THE VALE OF CONWAY SPA.

This water has become very celebrated, not only for the cure of skin diseases, but also for the cure of many other complaints; and is used not only externally but internally also.

The Vale of Conway Spa is now resorted to by so many persons every season, sometimes not fewer than a hundred persons per day drinking the water, that a reliable Popular Guide to its use is urgently called for. Such a guide the writer feels himself in a position to offer to the public, from having given much careful attention and study to its nature and properties, and had much practical experience of its effects, both poisonous and curative. And he hopes the following attempt to supply this want, though it may have many imperfections, will meet the requirements of the visitors to this delightful locality and this health-restoring water.

USES OF THE TREFRIW MINERAL WATER.

The Trefriw Mineral Water is a strong solution of sulphate of iron and sulphate alumina, with some sulphate of magnesia and soda, and a little chloride of manganese, calcium, and nickel. It is very similar, but greatly superior, to the celebrated Spa at Sandrock, in the Isle Wight, so highly spoken of by many eminent physicians, amongst whom are Dr. Lempriere, Dr. Saunders, Dr. Latham, senior, Dr. Young, Dr. Calvert, and Sir Charles Scudamore. And it has already obtained very high reputation in the treatment of diseases of the nervous system, of the stomach, and of women. And for that vast class of persons who, in these days of mental and bodily wear and tear, require "bracing-up," I know of no means equal to a visit to the Vale of Conway and a course of the Trefriw Chalybeate Water. Nor do I know of any better remedy for that very numerous class, "dyspeptics that have been physicked, *secundum artem*, with every medicine of the pharmacopœia." Nor for that other very numerous class, "convalescents from acute diseases." Or that not less numerous class whose troubles arise from "chronic discharges," or morbid secretions from mucous membranes. And I might add to this introductory index the sufferers from "chronic skin diseases, rheumatism, palsy, neuralgia," &c. Indeed, I may say, that in most "chronic" diseases that have resisted the usual means of cure, the patients would be greatly benefited by having their digestion, sanguification, assimilation, and secretion improved by a course of this truly wonderful medicine.

The curative action of the Trefriw Water is bracing and invigorating, and rather tardy and slow ; it is, therefore, more adapted to the cure of chronic than acute

diseases ; its proper sphere is chronic diseases that consist in torpidity of the digestive, assimilative, eliminative, or blood-forming processes, especially when marked by relaxation of the absorbent and venous capillaries of the glands, mucous membrane, or skin. This water operates principally, directly, specifically on the pneumogastric and great sympathetic nerves which, when weakened and relaxed, it braces and invigorates, and thereby it assists and promotes the chemico-vital changes that go on in the stomach and bowels with the food, in the lungs and glands with the blood, and in the tissues generally with their appropriation of the blood and elimination of the secretions. It is, therefore, a very efficient remedy in the diseases that have their origin in imperfect digestion, sanguification or blood-making, assimilation or appropriation, or elimination or secretion : whatever the cause of such diseases, if the patients do not readily recover under the usual medical treatment, I recommend them to have recourse to the Trefriw Water. But let it be distinctly understood that it is only in the chronic stage of disease, and after the failure of the usual specific medical treatment, that I recommend recourse to this water : it should not be resorted to in the acute or inflammatory stage of any disease, nor even in the chronic stage until the ordinary treatment has been fairly and fully tried and found to be inadequate to the complete restoration to health.

Now, the torpidity of the vital operations here referred to as the indication for the use of the Trefriw Water, generally results from one or more of the following *causes*, viz., mental fag, irregular dietetic habits, depressing and exhausting mental excitement, acute disease, inflammation, suppuration, impure air, improper diet, mineral poisons, and hereditary disposition : and

especially in the following *classes of disease*, viz., dyspepsia, constitutional or hereditary diseases, diseases of mucous membranes, chronic skin diseases, diseases of women, palsies, neuralgias, fits, and worms.

I.—MORBID STATES OF THE DIGESTION, SANGUIFICATION, AND ASSIMILATION.

1. *The Results of Mental Fag*, (Nervous Exhaustion) :
 In professional and commercial life mental fag is one of the most prolific causes of derangement of digestion, sanguification, and assimilation. In rustic life dyspepsia and nervous exhaustion are almost unknown. In the persons here referred to, nearly all their stock of vital or nervous energy is used up in the brain, by the intense and incessant mental exertion and harass, and the stomach and lungs, and other organs engaged in the processes of converting the food into blood, and the blood into nervous power, are left without their necessary supply ; and this evil is much aggravated if the mind is kept intensely at work during the meal times, as it generally is. Hence results imperfect digestion, and therefore imperfect blood, which, in its turn, yields imperfect nervous power ; and consequently the mental and bodily powers flag. Stimulants are then resorted to, and, though they do afford temporary relief, they only increase the exhaustion of the pneumogastric and great sympathetic nerves, and aggravate the disease. And these evils continuing, act and react on each other and increase the disease state, until eventually there is induced such a state of atonic congestion of the digestive apparatus and brain as to produce headache, sleeplessness or sleepiness, loss of appetite, constipation, piles, acidity, waterbrash, &c., &c., ending in confirmed dyspepsia with low spirits and melancholy,

(hypochondriasis), and complete nervous exhaustion. The bowels are then blamed, and aperients are taken again and again until the bowels are so weakened that they will not act except under the stimulus of a strong purgative. Then perhaps jaundice follows, or gout, or rheumatism, or erysipelas ; or, in the strumous, anæmia (watery blood), amenorrhœa (suppressed monthly), chlorosis (green sickness), consumption, &c., &c.

Now, in such cases, when the usual remedies, with a properly regulated diet and regimen, and such rest of mind as can be got without leaving home, fail to afford speedy removal of the disease, and it assumes a chronic character, I would send the patients away altogether, for they must give up work for a time ; and I would send them to Trefriw, because they must go somewhere, and I do not know any means so likely to afford a pleasant, speedy, and complete cure, or a mineral spring equal to the Trefriw Chalybeate, for bracing up the relaxed and exhausted peumogastric and great sympathetic nerves.

The course of proceeding should be something like the following, viz. :—The patient should confide his affairs to some one he can trust ; he should take with him a friend of congenial spirit and tastes, and a fishing rod and tackle, or a gun and amunition ; he should take up his abode at one of the hotels at Trefriw, or Llanrwst ; he should retire to bed early at night and rise early in the morning ; and he should take a course of the Trefriw Water. The dose of the water should be two teaspoonfuls ; and for the first week he should take one dose between breakfast and dinner and another between dinner and tea ; in the second week he should take also a dose before breakfast ; and in the third week also a dose between tea and supper : and he should continue this quan-

tity and frequency for four weeks, and then return to the minimum dose by the same degrees. He should also apply a compress, wetted with the water, over the pit of the stomach, and have a bath, or a pack once every day, or have the spine and abdomen sponged with the water, and followed by friction with the hand of an attendant, until a glow of warmth results. Under such treatment I have known some of the most desperate cases recover with amazing rapidity.

2. *The Results of Irregular Dietetic Habits.*—Similar evils to the former result when, though the mental fag is not so intense or incessant, the meals are taken irregularly; the person dining now at six o'clock—after the gastric juice has been secreted and washed away, sometimes by stimulants, and then dining at one o'clock—some hours before the usual time, and so before the stomach is prepared for the reception and digestion of food; and the same evils result from the habits of fasting some days and feasting others.

The same observations apply to the treatment of these patients as the former.

3. *The Results of Depressing Mental and Nervous Excitement.*—By this cause I mean that morbid excitement in connection with the affections and sexual organs that so rapidly and completely exhausts the brain and nervous system, and so checks the digestive, blood-forming, and assimilative functions as to produce very obstinate and very complete debility, anæmia, chlorosis, phthisis, amenorrhœa (suppressed monthly), menorrhagia (excessive monthly), whites, hysteria, spermatorrhœa, impotence, sterility, miscarriage, headache, tic douloureux, and other neuralgias, and not unfrequently insanity.

Such cases require moral as well as medicinal treat-

ment, and must be managed judiciously ; and it is in such cases that the Vale of Conway and the Trefriw Water are so remarkably efficacious, from their specific bracing effect on the relaxed and exhausted nervous system.

Here the Chalybeate treatment must be begun gradually and carried on perseveringly, beginning with one teaspoonful twice a day for a week, then three times a day for another week, then two teaspoonfuls three times a day for a week, and afterwards four times a day ; and continue this dose and frequency for four weeks, and then return to the minimum dose by the same degrees. At the same time sponging the whole length of the spine night and morning, following this by friction with the hand of an attendant until a glow follows ; as soon as it can be borne a compress over the stomach, and towards the seventh or eighth week, but not earlier, such patients may venture to bathe, or to have a pack.

4. *The Results of Acute Diseases.*—These diseases are the infectious fevers, (typhus, typhoid, small pox, scarlet fever, measles, and erysipelas, especially phlegmonous) ; inflammations, especially cellular ; and suppurations, especially from the absorption of animal poisons. The anæmia and debility (from the utterly exhausted and prostrated state of the digestive, blood-forming, and assimilative functions) that follow these diseases, is such that physicians usually recommend change of air and the use of Chalybeate waters. And for such the Trefriw Water is, of all known Chalybeates, the most suitable and efficacious, from its powerful and specific bracing effects on the pneumogastric and great sympathetic nerves, which preside over these functions. Under its use the appetite returns and the digestion improves, the blood is replenished, the muscles regain their firmness, the skin re-

assumes its florid and healthy condition, the spirits revive, and the strength is regained more rapidly than under any other means with which I am acquainted.

Here the dose must be two or three teaspoonfuls, at first two, and then three, and afterwards four times a day : and at the same time general bathing, or sponging of the whole body, or a general or partial pack, followed by friction once every day, continuing the course for ten or eleven weeks, gradually given up as in the other cases.

5. *The Results of Impure Air.*—These are seen in the anæmia and debility that follow confinement in close ill-ventilated places, such as coal pits, mines, manufactories, prisons, work-rooms, (as in the case of milliners and dress-makers, and cotton and silk weavers), and in bed-rooms, (as in the case of nurses, and patients confined to bed with child-birth, fractures, dislocations, deep-seated abscesses, diseases of joints and ulcers of the legs). The depressing influence of these causes, especially on the blood-formation, is seen in the pale anæmic countenances of those subjected to it. For such cases Chalybeates are just the remedies, and none is more suitable than the Trefriw Water, assisted by the fresh bracing mountain air of the Vale of Conway.

The course may be similar to the one recommended for convalescents from acute disease.

6. *The Results of Improper Diet.*—Diet is improper when it is too uniform, too fleshy, too farinaceous, or too alcoholic. All these improprieties, if continued for a length of time, induce a morbid state of the liver and digestive organs which ends in confirmed dyspepsia, purpura hæmorrhagica (scurvy), gout, erysipelas, or rheumatism, or some such disease ; from the production of blood either excessive or deficient in nitrogenous, carbon-

aceous, or mineral constituents. For these cases, after enforcing proper dietetic rules and using the appropriate specific remedies, if health be not completely restored, I can with confidence recommend a course of the Trefriw Water, in the same manner as for the diseases induced by mental fag.

7. *The Results of Mineral Poisons.*—These are mostly in the case of workers in metals, as lead in the case of painters, lead and antimony in the case of printers, mercury in the case of looking-glass makers, phosphorus in the case of matchmakers, and copper, arsenic, and lead in the case of miners, and lastly, though not least frequently, mercury and arsenic in the case of allopathic drugging. These poisons, it is well known, so derange the blood-making function, the nervous supply and conduction, and the alimentary canal, as to produce various diseases, such as lead constipation, colic and palsy; mercurial eczema, trembling, paralysis, loss of the teeth, intestinal irritation, and destruction of the bones; copper epilepsy and phthisis; arsenical eczema, ulceration, ophthalmia, and gastric irritability.

Now, for each of these poisons the Trefriw Water is one of the best antidotes; and in the case of mercury and lead it is absolutely specific: and I know of no remedy equal to it in the treatment of mercurial salivation, trembling, paralysis, eruptions, ulcerations of bone, and intestinal irritability; or in the treatment of lead constipation, colic, and paralysis; the effect in these cases is truly wonderful; and almost every resident in the neighbourhood can tell of some wonderful cure of one or more instances.

The treatment should be similar to that for convalescents from acute disease.

II.—CONSTITUTIONAL OR HEREDITARY DISEASES.

These diseases are scrofula, glandular diseases, tabes mesenterica, consumption, rickets, spinal disease, hip-joint disease, &c., &c. In all these diseases the great fault is either imperfect assimilation of the new materials from the blood by the tissue-cells, or their (the cells) imperfect elimination of the old or waste material, or imperfect absorption (carrying away) of this refuse matter by the absorbent or venous capillaries, or perhaps all these together. The prime cause of this imperfection in the processes of life is debility of the great sympathetic nerve that presides over them. And for the bracing up of this nerve I know of no better remedy, after the failure of the usual means, than the Trefriw Water given very insidiously, carefully, and perseveringly, in very small doses, beginning with a teaspoonful twice a day for two weeks, then three times a day for another two weeks, then two teaspoonfuls three times a day for another two weeks, and afterwards four times a day for two weeks, and then gradually diminish by the same degrees. Spinal and abdominal sponging and friction may be used at the same time with advantage, and when it can be borne bathing, or a pack.

III.—DISEASES OF MUCOUS MEMBRANES.

These are chronic discharges; such as in chronic bronchitis and ophthalmia, runnings from the ears and nose, catarrh of the bladder, gleet, spermatorrhœa, whites, diarrhœa, dropsy, and hydrocephalus; bleedings from the lungs, nose, womb, stomach, and bowels; the colliquative sweat and diarrhœa of hectic fever; polypus, and piles. Of all the diseases for which the Trefriw Water is useful,

there are none in which it is more efficacious than those that depend upon a relaxed and torpid state of the absorbent and venous capillaries of the mucous membranes. Some of these diseases, as chronic bronchitis and ophthalmia, dropsy, and the discharges from the nose and ears, may have resulted from having taken cold; and others, as whites, gleet, spermatorrhœa, profuse menstruation, &c., may have been the result of the depressing mental and nervous excitement before noticed; but, whatever the cause, these are of all diseases the most amenable to the power of the Trefriw Water. It speedily *cures* them by its specific toning power on the relaxed absorbent and venous capillaries of the mucous membrane, in virtue of its operation on the great sympathetic nerve.

In these cases, as well as the internal and general external treatment recommended for the convalescents from acute disease, it may be applied with much advantage locally as lotion, or injection, in the case of ophthalmia, ottorrhœa, ozena, whites, and gleet, and even spermatorrhœa.

IV.—CHRONIC SKIN DISEASES.

These are prurigo, psoriasis, lepra, pityriasis, eczema, impetigo, favus, and other varieties of tinea, especially moist and dry scall-head, and the various forms of mercurio-syphilitic eruptions, and carbuncles, boils, warts, &c. These chronic skin diseases are but the external manifestations of internal morbid states; and experience fully justifies the high reputation this water has obtained in the treatment of such cases.

In these cases it is to be employed both internally and externally, as recommended under the treatment of morbid states of mucous membranes.

V.—DISEASES OF THE NERVOUS SYSTEM.

These are palsies, fits, tic-doloureux, and other neuralgias ; particularly when they have resulted from nervous exhaustion, as in the cases of mental fag ; or from loss of blood, as in cases of uterine and other bleedings ; or from the loss of other animal fluids, as in cases of spermatorrhœa, whites, perspirations, and other discharges ; or from acute diseases, as diphtheria, cholera, and typhus ; or from mineral poisons, as mercury, lead, copper, and arsenic.

In all such cases the use of the Trefriw Chalybeate Water is very beneficial. There is scarcely a villager who cannot tell some wonderful stories of how persons were brought in vehicles and carried to the well ; and how, after a time, they felt dreadful pain in the paralysed part for a day or two, and then in a very short time afterwards they *walked* away quite well.

The treatment should be similar to that recommended for the results of mineral poisons.

VI.—WORMS.

I know from personal observation that not only does the Trefriw Water restore the tone of the digestive organs and improve their secretions so as to prevent the generation of worms, but it absolutely, and in large doses immediately, causes the expulsion of those already existing in the alimentary canal—whether they be the round worms, the tape worms, or the pin worms : here it is a safe and effectual remedy.

The treatment may be similar to that of diseased states of mucous membranes, with perhaps one or two large doses for the expulsion.

The foregoing diseases have been selected and described in order to illustrate the *sphere* of the curative action of the Trefriw Water. It will be perceived that they all depend upon one and the same morbid state, viz., debility or torpidity of the pneumogastric, or the great sympathetic nerve; or, more properly, that they all are but one morbid state under different *phases*, the *phasis* being determined by the kind of exciting cause, or the circumstances under which the disease was excited, or had existed.

THE REASON WHY THE TREFRIW WATER CURES THESE DISEASES is, that it operates directly and specifically on the pneumogastric and great sympathetic nerves. This is known, and the manner in which it operates on them, by observing its effects when taken in too large doses, too frequently, or by persons in health. Of these effects I have collected a great number from a variety of reliable sources; and I have myself taken the water in doses of one ounce, frequently repeated, until I was thoroughly ill, and recorded the effects produced. To convey these effects to the reader, it will be well to classify them under three heads, viz., the immediate effects, or the effects of *enormous* doses, the effects of *large* doses, and the effects of *small* doses.

I. The effects of doses of about a pint, or even half a pint, are exhibited immediately, especially if the stomach were empty, and they are those of a corrosive, irritant poison, viz., nausea, with horrible twisting, spasmodic, doubling-up pain in the stomach, with violent vomiting of sour, blackish matter, and sometimes of blood, followed by great sensitiveness and irritability and tenderness of the stomach, succeeded by great prostration, no appetite, pulse quick, small, and feeble, and the skin covered with a clammy, cold sweat.

II. The effects of doses of a wineglassful repeated three or four times a day for a few days are, after a few doses have been taken, gnawing or craving at the stomach, with increase of appetite and warmth, and a feeling of vigour throughout the system; the pulse becomes quicker and firmer, the eyes brighter and the skin clearer, the bowels rather confined, and the stools drier and black; perhaps a feeling of fulness about the head, a congestive headache, which is relieved by exertion: and after a few more doses, and especially if the quantity be increased or taken more frequently, these feelings are replaced by their opposites, and there succeed nausea and vomiting, diarrhœa, and tormenting pain about the stomach and bowels, fetid eructations, with distension of the stomach and bowels with flatulence; and very soon the symptoms that result from enormous doses follow.

III. The effects of doses of a teaspoonful repeated three or four times a day are, after a few doses have been taken, a feeling of excitement throughout the system, with increase of appetite and a feeling of warmth about the stomach, increase of strength, animation, buoyancy, and cheerfulness, and pleasure in the duties of life; the pulse increases in frequency and fulness, and gets a kind of bound; the stools become drier, firmer, and dark; there is a kind of fulness about the head, with dull headache before meals: and then, under continued and increasing doses, there comes on an uncomfortable, oppressed feeling about the stomach, and the appetite begins to fail, and the taste less sensitive, with a foulness of the mouth, foul eructations, with flatulence and waterbrash, with distension of stomach, worse after eating; the pulse gets slower and jerking; the tongue becomes coated and flabby, and the spirits sink; then a sense of weariness of

the limbs, and lassitude and dislike to bodily and mental exertion ; easily fatigued and knocked out of breath ; the bowels become uncomfortable, with rumbling, distension, and pain, followed by diarrhœa, with much fetid flatulence, with gastric and intestinal irritability : then anæmia, jaundice, chlorosis, and general debility.

Such then are some of the pathogenetic effects of the Trefriw Water on persons in health. They indicate the parts of the body on which it operates, and the kind of operation it has on them, and thereby the class of diseases in which it is likely to be found useful.

The curative powers of the Trefriw Water are just such as we might expect from its composition, for its principle constituents are iron, alum, and sulphuric acid, as will be seen by the following analysis, by David Waldie, Esq., of London, made in 1844 :—

Sp. Gr. 1·0089, temperature 52° F., reaction powerfully acid. 10,000 fluid grains contain—

Protoxide of Iron ...	...	...	...	25·48
Peroxide of Iron ...	...	...	...	0·83
Alumina ...	...	...	...	3·86
Magnesia, with a little Soda	...	...	...	4·60
Lime ...	...	...	...	1·87
Oxide of Manganese	...	...	...	Traces
Oxide of Nickel ...	...	...	...	Traces
Sulphuric Acid ...	...	...	...	48·10
Chlorine ...	...	...	...	2·96
				<hr/>
	OR,			87·07
Photosulphate of Iron (dry)...	...	...	...	54·55
Persulphate of Iron	...	...	...	2·17
Sulphate of Alumina	...	...	...	12·89
Sulphate of Magnesia and Soda	...	...	...	13·33
Chloride of Calcium	...	...	...	3·72
Chloride of Manganese	...	...	...	} 1·04
Chloride of Nickel, and loss	...	...	...
				<hr/>
				87·07

I have given here the analysis of the water of only one of the wells, for it is originally the same in all three, because it percolates through the same bed of rock ; as Mr. Waldie says, “ No. 2 is the same as No. 1, with the addition of more oxide of iron and alumina, the iron being also *peroxidized*, without any proportional increase of sulphuric acid.” It is altered in the first two only by exposure to air and light, which convert the soluble green oxide into the insoluble brown oxide ; but when protected from the air and light it will be exactly the same in all as it is now in the one that is preserved from the influence of these ; and this is now being done by Lord Willoughby d' Ersby, the proprietor of the Spa.

This analysis shews that every 10,000 fluid grains or drops of the water contain eighty-seven grains—nearly one hundredth part—of mineral ingredients, fifty-four grains of which—or more than one half—are soluble sulphate of iron. Therefore every tablespoonful of this water contains, besides some magnesia, soda, lime, manganese, and nickel, two grains and a quarter of crystallized sulphate of iron, green vitriol, copperas, and two grains and a quarter of crystallized alum. And these ingredients are in solution in a state of most minute subdivision, and therefore capable of being taken into the most minute vessels, and carried to the very nucleoli (centre points) of the cells of the tissues, there to exert their influences.

And this analysis also displays three other very important facts, namely, *1st*, that this water is exceedingly rich in mineral constituents, especially iron, alumina, and sulphuric acid, which are three very powerful drugs ; *2nd*, that in it the iron and alumina exist in the state of sulphate, which is their most active and energetic form ; *3rd*, that the iron exists in the state of proto, or green, oxide,

which is decidedly its most eligible form. The fact that the iron exists in the state of sulphate of the green oxide is a very important one, and the one that gives to this water its superiority over most other Chalybeate Waters ; for in Chalybeate Waters the iron generally exists in the state of carbonate, which is a much less active and certain preparation. There are very few instances of it existing as a sulphate ; I have not been able to discover more than six others in this country, and indeed they can occur only in the neighbourhood of iron pyrites and alum-slate rocks. Sulphate Chalybeate Waters are greatly superior to carbonate, as a very well-informed writer on this subject, Dr. Alexander, says, " They possess infinitely greater medicinal power than the carbonate Chalybeates." Of carbonate Chalybeate Waters there have been discovered and described a great number, not fewer than four to five hundred, of which some twenty to thirty are in Great Britain. Of sulphate Chalybeate Waters there have been described only about thirty to forty, of which only seven are in Great Britain ; these are, at Trefriw, in the Vale of Conway, North Wales ; at Horley Green, near Halifax, in Yorkshire ; at Gilsland, in Cumberland ; at Hartfell, near Moffat, in Scotland ; at Sandrock, in the Isle of Wight ; and, according to Dr. Alexander, at Vicar's Bridge ; and one somewhere in Buckinghamshire.

I have not been able to ascertain the source or composition of the water at Vicar's Bridge, or in Buckinghamshire ; but I believe them to be of very little importance. The water at Hartfell is very weak and very uncertain in both quantity and quality, from its being a surface water and exposed to light and air : in dry weather there is scarcely any of it to be got, and in wet weather it can scarcely be got at, from its being five miles

from the place of lodgings, Moffat ; it is, therefore, usually sent for, or bought at the Apothecary's shop, and therefore generally spoiled before it is got. The Gilsland Spa too is very weak and uncertain. And so is the Horley Green Spa, which, though stronger than either the Hartfell, or Gilsland, does not contain more than quarter of a grain of sulphate of iron in the tablespoonful, and it too is uncertain, because it is becoming weaker and weaker, from the shaly slate through which the water percolates becoming exhausted. The Sandrock Spa is much stronger and more certain in quality and uniform in quantity than any of the three just noticed, but it is greatly inferior to the Trefriw Spa, inasmuch as it contains a smaller proportion of iron and a much larger proportion of alum.

The Trefriw Spa too is easily accessible, abundant and uniform in quantity, and certain and uniform in composition and effects. It is, therefore, the best of the sulphate Chalybeate Waters of this country ; and as sulphate Chalybeates are the best of all Chalybeates, *the Trefriw Spa is the finest Chalybeate Water of Great Britain.* Now it is a great boon to us of this part of the kingdom to have the finest Chalybeate of the country near at hand, cheap and easily to be got at, and situated in one of the most beautiful spots of the kingdom, the scenery of which has both the grand majesty of the Carnarvonshire mountains, and the calm quiet of a lovely valley bisected by a beautiful winding river, and the air of which is not only pure but soft and mild in the valley, and light, sharp, and invigorating on the mountains, and tempered by sea breezes.

The composition of the Trefriw Water would appear to insure for it an extensive range of action, corresponding somewhat with the powers of its individual ingredients ;

it might, for instance, in virtue of the iron it contains, be expected to cure the diseases for which iron is the curative drug, and by virtue of its alum it might be expected to cure the diseases for which alum is the curative medicine, and by virtue of its sulphuric acid to cure the diseases for which sulphuric acid is the remedy, and so on with its other constituents ; and no doubt this is partially true, but not wholly so ; for this water, like every other compound, acts not as a mixture of different ingredients, in which each performs its own cures, but it acts as one single remedy, putting forth powers peculiar to itself, and in large doses producing effects differing from those of any other poison, and in small doses curing diseased states that it is more appropriate for than is any other remedy. Still it must be granted that we may form a somewhat approximate idea of the kind of influence it will have on the system, and of the remedial powers it is likely to possess, by a glance at its composition, especially seeing that the influence and curative powers of its principal ingredients, namely, iron, alum, and sulphuric acid, are well known to us.

Iron, for instance, expends its influence especially on the digestive and blood forming processes, which in small doses it promotes and increases by virtue of its operation on the pneumogastric and great sympathetic nerves ; hence its beneficial effects in indigestion and most other stomach complaints. The influence of iron is particularly felt and exhibited by the vascular system and vascular organs, especially the spleen and lungs ; hence its beneficial effects in cases where the blood is poor and watery, as shown by a pale, waxy, and unhealthy skin, in anæmia, chlorosis, scrofula, and consumption, and most of the diseases of women, as too watery, too profuse, too scanty or sup-

pressed "monthly;" miscarriage, whites, dropsy, atonic diarrhœa or constipation, and tic douloureux, and other neuralgias. And, moreover, in the Trefriw Water the iron exists as a *sulphate* of the protoxide, which is the most active and energetic form in which iron is known to exist—a state in which it is most corrosive, rapid, and intense in its action. Protosulphate of iron (green vitriol, copperas) is an irritant poison, causing, in large doses, spasmodic pain in the stomach and bowels, with vomiting and purging, and loss of appetite, and earthy or clayey complexion. In small doses it is an excellent tonic, astringent, and anthelmintic, and is very useful in passive hæmorrhages, chronic diarrhœa, and atonic mucous discharges, as ophthalmia, ottorrhœa, leucorrhœa, &c. ; and in the treatment of indigestion, waterbrash, debility, anæmia, chlorosis, and all other diseases in which iron is useful. And of this very important medicine the Trefriw Water contains about two grains and a quarter in every tablespoonful, and that in the most minute subdivision dissolved in the water. This is the ordinary allopathic dose of protosulphate of iron.

Alum expends its influence especially on the mucous membrane and skin, which in small doses it tones and invigorates; hence its beneficial effects in waterbrash, constipation, especially that of lead, diarrhœa especially that of consumptives, dysentery, leucorrhœa, gleet, catarrh of the bladder, and mucous discharges from the nose, eyes, ears, &c., and some cutaneous eruptions. And of this important medicine every tablespoonful of the Trefriw Water contains two grains and a quarter.

Sulphuric Acid also expends its influence principally on the mucous membrane and skin, but it has also a profound influence on the nutrition of the body. In small

doses it is an excellent tonic, it excites the appetite and promotes digestion and nutrition, it strengthens the weak stomach, checks emaciation, acidity, waterbrash, diarrhœa, dysentery, lead colic, mercurial salivation, scurvy, spitting of blood, bleeding from the nose, stomach, bowels, and womb, and the colliquative sweating and diarrhœa of hectic fever ; and externally forms an excellent application in putrid sore throat, apthous mouth, cutaneous eruptions, and ill-conditioned ulcers. And of this very powerful remedy—the strong sulphuric acid—every tablespoonful of the Trefriw Water contains about two drops and a half, which is equal to twenty drops of elixir of vitriol—the ordinary allopathic dose.

And if we might conclude that the *sulphur* of the sulphuric acid is by decomposition liberated in the tissues, we might then take into account the influence and operation of one of the most powerful and effectual of remedies in all cases of defective nutrition and skin disease, and account still more fully for the curative powers of the Trefriw Water. But enough has been said as to the principal ingredients.

Of the other constituents, magnesium, sodium, calcium, and manganese, nothing need be said, as they are common in mineral waters and not very influential. Nickel, however, is peculiar to this water, as it has not yet been discovered in any other. Very little is known of its pathogenetic or therapeutic influence or sphere, but it may impart a peculiarity of operation to this, not possessed by any other mineral water.

THE SOURCE OF THE TREFRIW WATER.

Now whence does this water come? And how does it obtain its mineral constituents? Its source must be

inexhaustible, and at a considerable distance, for the supply is constant and invariable, and the quantity and proportion of the mineral ingredients constant and uniform. It cannot be mere surface water, because its temperature is always the same, both winter and summer, and it is not influenced by the amount of rain or snowfall; nor can it come from any great depth, because it is always cold, having a temperature of only 52° F., when the air is 60° F. Its source, indeed, is the lake (*Llyn Cwlyd*) which lies amongst the mountains behind Trefriw, and its mineral constituents are obtained from the beds of iron pyrites and alum slate, of which these mountains are chiefly composed.

Of course the nature and properties of mineral waters result from the kind and nature of the rocks through which the water passes. Now, in the case of the Trefriw Spa, the water passes through beds of iron pyrites and alum slate. The mountains on the Carnarvonshire side of the valley near Trefriw are composed chiefly of iron pyrites and alum slate fractured, dislocated, and thrown up irregularly in all directions. Amongst these mountains behind Trefriw is *Llyn Cwlyd*, and the stream from it runs down behind the mountains, and reaches the river through the falls of *Dolgarrog*, two miles below the village. Some of the water from this lake and stream percolates the fractured beds of iron pyrites and alum slate, and finds its exit out of the mountain where these crop out near its base on the valley side, a mile and a quarter below Trefriw, where the Spa is situated. Hence the water must be impregnated with the constituents of iron pyrites and alum slate; and these are sulphur, iron, magnesia, soda, lime, manganese, and nickel. The *iron pyrites* is of a whitish yellow colour, hard, heavy, inodo-

rous, tasteless and insoluble, and breaks with a granular cross-fracture. It contains sulphur and iron. Some pieces are whiter, from containing more iron, and others yellower, from containing more sulphur, and others blackish, from containing alum slate. There is always some of it near to the road side, by the entrance to the Spa, brought down from the mine above, whence the Messrs. Hill obtain it, bring it to Liverpool, and make sulphuric acid from it. The *alum ore* is blackish, from the coal it contains, hence called "Black Band;" it closely resembles slate, hence it is called "Alum Slate." It contains besides alumina and coal, sulphur, iron, magnesia, soda, lime, nickel, &c. When taken from the bed it is inodorous, tasteless, and insoluble, and splits like slate, and breaks with an even cross-fracture. Some pieces are heavier than others, and contain yellow particles or veins of iron pyrites. It undergoes great changes by exposure to air and moisture, or water containing air or oxygen; its massive structure then breaks up, and it crumbles into a powder, in consequence of the formation of small crystals between its layers: these crystals consist of sulphate of iron and sulphate of alumina, and result from the decomposition of the sulphuret of iron (the pyrites); the iron of which takes oxygen and becomes oxide of iron, and the sulphur takes oxygen and becomes sulphuric acid, and this acid then unites with the alumina and oxide of iron, forming sulphate of iron and sulphate of alumina. Many pieces of it are to be seen in the neighbourhood of the Spa, in different stages of decomposition, some just splitting, and others crumbled to powder, and incrustated with the white powder of alum. These pieces have been thrown down from the mine above, and they lie about, or are used in building the walls, &c. In some places these

two rocks (pyrites and black band) are separate and distinct, but in others they are mixed together in various proportions ; of the mixed variety there is a very thick bed near the base of the mountain *Aillt Cae Coch*, not far from the farm called *Cae Coch* ; and it is through this bed that the water percolates, decomposing and dissolving in its course portions of the rock through which it passes, and carrying them with it into the old mine cutting there, where it is collected in rude basins, forming the "Trefriw Wells;" hence the composition of the water. In the case of the Trefriw Spa, the moisture and oxygen for the decomposition of the alum slate and iron pyrites, are supplied by the water that percolates the rock from the lake on the other side of the mountain, and these chemical changes take place during the time occupied by its passage, the duration of which must be considerable, perhaps some years, as the rock is pretty close-grained, and the distance the water has to percolate cannot be less than from two to three miles. These circumstances will also account for the great strength, and the uniform temperature, quantity, and quality, which are always the same, winter and summer, wet weather and dry. The quantity of water discharged per minute cannot be less than one gallon ; this quantity is limited by the extent of the cutting into the bed, and this might be greatly increased, and the supply thereby greatly augmented.

The water is quite cold, 52° F.; it is destitute of gas ; when fresh it is bright and clear as crystal ; has a styptic, astringent, sour or acid, rather inky but not disagreeable taste : but after a little exposure to the air it becomes yellowish and somewhat limpid, with a disagreeable, sickly taste, from the decomposition of the sulphate of iron ; and it is then quite unfit for use.

LOCALITY OF THE TREFRIW SPA.

The Vale of Conway is situated in North Wales, between the Denbighshire and Carnarvonshire ranges of mountains, and extends due South from the Irish Sea up to Bettws-y-Coed, a length of about sixteen miles. Through this little picturesque valley the River Conway (which separates Denbighshire and Carnarvonshire) flows from amongst the mountains above Bettws, past Llanrwst, Trefriw, and Conway, into the Irish Sea, along with Beaumaris Bay, by the side of Llandudno, and between the Great Orme's Head and Puffin Island. The *turnpike road* from Conway runs up the valley on the Western or Carnarvonshire side of the river through Trefriw, which is nine miles and a half from Conway, past Llanrwst, which is twelve miles, up to Bettws-y-Coed, which is sixteen miles from Conway. The whole of this side of the valley is formed by high mountains, including amongst them *Carnedd Llewellyn*, 3,460 feet, and *Carnedd Dafydd*, 3,427 feet high; and amongst those are numerous lakes from which the water pours down in beautiful cascades in its passage to the river. The *railway* from the Conway and Llandudno Junction runs on the Denbighshire or Eastern side of the river up to Llanrwst, where a bridge crosses the river to the turnpike road. Over this bridge, two miles and a half lower down on the Carnarvonshire side of the river, is the village of Trefriw; and a mile and a quarter below this, through the base of the mountain *Allt Cae Coch*, the water from the lake behind percolates, and issues out of the mountain side at the cropping out of the bed of the blackish pyrites some fifty yards up from the road-side. Into the edge of this bed of pyrites, near the farm called *Cae Coch*, is an old mine cutting and cave into

which the water flows, and being collected in rude basins made in the rock, forms the Trefriw Spa, which is the great attraction of this neighbourhood, and has rendered it so celebrated as a place of resort for invalids.

DISCOVERY OF THE TREFRIW SPA.

The discovery of the Trefriw Spa took place in the following manner, as related to me by an eye-witness, Mr. William Owen, Lord Willoughby d'Ersby's mine agent at Trefriw, who was born and brought up in the neighbourhood. He says, that about thirty-two years ago, about 1833, when he was a young man working as a miner in the sulphur mine near the top of the mountain *Alt Cae Coch*, his father, Mr. Robert Owen, who was then Lord Willoughby's mine agent, was told by a man of ninety years of age, who had been born and brought up near the place, that when he was a boy there used to be an old mine cutting and cave in the same mountain below the present sulphur mine, and some fifty yards up from the roadside, and not far from the farm called *Cae Coch*, but that the cutting had been gradually filled up and covered in by rubbish rolled down from the sulphur mine. His father got the old man to point out the spot, and he then employed a miner and his own son, the narrator, to clear away some of the *debris* and seek the old mine cutting; this occupied them many days, as the *debris* was several yards thick, and, by the iron-water running down amongst it, was so rusted and cemented together as to require picking and blasting, but at length they came upon the cutting and to the cave; the cave, from being thus blocked up, was filled with water, which, when the cave was opened, gushed out with great force; his father placed his keys into the water for the night, and repeated this

several times to ascertain the nature of the water, and always found them so affected the next morning that he concluded the water was very similar to that which came down from the sulphur mine ; and which, from time immemorial, had been celebrated for the cure of skin diseases, especially of cattle, which used to be brought from all the country round to be washed and dosed with it, and he has seen them killed by it. And he also thinks this is the water alluded to by Dr. O. O. Roberts as having nearly caused the death of the gentleman who was out shooting, because sportsmen would be up amongst the trees, and because the present water was not then running, for it had no outlet forty-five years ago ; and the way in which it was discovered was by his father seeking the old mine, not the source of any water.

Within a very few years after the discovery of the present Spa, about thirty-two years ago, strangers began to come and bathe in and drink the water, and it soon obtained great reputation in the cure of old palsies, rheumatisms, and stomach disorders. His father one day called the attention of Dr. O. O. Roberts to it, and he, in 1844, sent samples to London, and got it analyzed by D. Waldie, Esq., and wrote a pamphlet on it. Since that time it has grown rapidly in public estimation, and become very celebrated for the cure of a great many diseases.

ORIGIN OF THE TREFRIW SPA.

There is no account or tradition as to when or by whom this mine cutting was made, but it is evident that it must have been made some hundreds of years ago, for it was buried several yards deep with the *debris* from the upper mine cemented together with age. It would appear that ages ago some miners had pierced the side of the

mountain just at the cropping out of the bed of black-band, probably in search of a vein of sulphur similar to the one above; and after having made a cutting some yards in length, they pierced an opening into the mountain six feet high by four wide, straight forward for about five yards, and then desisted in that direction, and carried a similar cutting to the left for about seven yards, and afterwards to the right for about fifteen yards, but not finding what they were in search of they abandoned the enterprize, and the cutting got filled up as before stated.

Into this cave the water, percolating the bed of blackish pyrites near the floor, oozes, carrying with it a solution of the decomposed and dissolved constituents of the rock, amongst which is a large quantity of sulphate of iron and sulphate of alumina, and being collected in little basins made in the three different cuttings, forms the Trefriw Mineral Wells; and being, at the end of the right hand cutting, protected from the air and light, the iron is preserved in its protoxide state, which is a very great desideratum in this medicine, and scarcely to be found elsewhere.

DOSE AND MODE OF ADMINISTRATION OF THE TREFRIW WATER.

Internally: The Trefriw Water should be taken at the well immediately as it springs from the rock, and into a stomach empty, or nearly so. The fewest number of doses per day should be one, and the greatest five. Two tablespoonfuls, that is one ounce, is the most excessive dose any one should venture on. The quantity should never exceed one ounce, nor the frequency five times a day. Let it be remembered that two tablespoonfuls of this water contain four grains and a half of crystallized

sulphate of iron, green vitriol, copperas ; the most excessive dose ordered by allopathic physicians. What then might be the evil result of taking a tumblerful, that is fifty-five grains of copperas ? Perhaps fatal. Besides it is universally admitted that medicines in solution in mineral waters act more energetically than when artificially prepared.

The best plan is to take two or three teaspoonfuls for a dose, and for the first week one dose between breakfast and dinner, and another between dinner and tea ; for the second week also a dose before breakfast, and for the third week also a dose between tea and supper, and to continue this quantity and frequency for one, two, or three weeks, and then return to the minimum dose by the same degrees. This will form a full "course," and except in rare instances it need not be longer, and should very seldom be shorter. And it is also true that if the patient feel worse instead of better at the end of the second week, the water is not the medicine for him, and he should cease taking it. Many persons, I am sorry to have to say, take larger doses than I have mentioned and less frequently, for instance a half or whole wineglassful once or twice a day ; but I am convinced this is a mistake. The concentrated strength of the water and the corrosive nature of its constituents utterly forbid large quantities ; not only the very large ones as dangerous, but also the large ones as less likely to be beneficial because of their astringent, if not corrosive, effect on the mucous lining of the stomach, causing their immediate decomposition, and their rejection instead of absorption, throwing the iron out of the body by the stools. Three teaspoonfuls three times a day will blacken the stools in three days, from the iron even in that dose being exces-

sive, and some of it having to pass away by the bowels unabsorbed ; what, therefore, is the use of taking any larger dose ? there would only be the more to pass away by the bowels, to say the least of it. A very safe rule is that the quantity taken shall be just sufficient to *green* the stools but not to *blacken* them. With this dose the bowels will act as usual, but if the stools be blackened, constipation will supervene. And what Dr. O. O. Roberts says is quite true, viz., that all practical experience in the use of these waters proves that the patients who take the larger doses do not experience the same benefit, nor make the same progress healthward, as those who restrict themselves to the smaller dose.

This water is extremely sensitive to the influence of air and light, and on no account that can be possibly avoided should it be exposed to either before being drunk ; it should not even be brought to the mouth of the cave, but drunk at the fountain head itself by every patient that can possibly reach that magic spot. I may, however, observe, for the encouragement of those who cannot possibly reach the natural source, that if bottled at the fountain head by the mere light of a candle, and the bottles filled up to the cork and corked well whilst fully immersed in the well, that is under water, and wrapped in paper, it may be carried away and transported to any distance and kept for some time ; but when opened it should be taken immediately, for on the least exposure decomposition takes place, and in a short time the iron becomes peroxidized—changed from the *green* to the *brown* oxide, or rust—and separates, leaving merely a solution of alum and the other salts.

Externally : The external use of the Trefriw Water may be either general or partial bathing, general or par-

tial sponging, general or partial pack, hydropathic compress, or as an ordinary lotion, collyrium, or injection.

The bath must be taken at the Spa, and once or twice a day, when the stomach is empty, or nearly so, and followed by brisk friction. The immediate effect of the bath is a peculiar glow of very agreeable warmth, with a very pleasant sensation in the skin, and a feeling of freshness and vigour of the whole body; the reaction is remarkably quick and pleasant, and quite out of proportion to the primary shock which, considering the coldness of the water—52° F.—is wonderfully mild and transitory.

The pack may be used at the patient's lodgings, care being taken to use sheets, towels, &c. for the purpose, because they will be iron-moulded.

As lotion, collyrium, and injection, whenever convenient, it should be used at the Spa; but it may be carried away for that purpose, if done as previously directed.

Lord Willoughby d'Ersby has, at his own expense, built two Bath-Rooms, and greatly improved the approach to the Spa: and it is to be hoped he will complete the benevolent work by the addition of a Pump-Room. These will be a very great boon to the public, and transmit his name to posterity as a benefactor to his race. The buildings and approaches reflect great credit on the taste of his lordship's steward—E. S. Beech, Esq., of Gwydyr Ucha—under whose direction they have been carried out.

SEASON FOR VISITING TREFRIW SPA.

The time of the year for visiting Trefriw lasts from the end of April to the end of September; the best months being June, July, and August. Not in March, because it is exposed to the East winds; nor early in

April or in October, because the mountains just behind break the clouds brought by the West winds from the Atlantic, and the rain pours down into the valley ; nor in November, because of the fogs.

Besides, it is only from May to September that flesh-meat can be had at Trefriw ; at other times it has to be fetched from Llanrwst, a distance of two miles and a half. At Llanrwst there are generally liberal supplies ; and anything may be got at any time from Llandudno and Conway.

THE VALE OF CONWAY.

It is not only the health-restoring water that has rendered Trefriw so celebrated as a resort for invalids, the beautiful valley and the mountain air and scenery have done much to increase its attraction and celebrity.

Trefriw is a small village, situated on an elevated declivity, facing the East, on the Carnarvonshire side of the celebrated Vale of Conway, and distant about nine miles and a half from Conway, two and a half from Llanrwst, and about five from Bettws-y-Coed. It presents, as Dr. O. O. Roberts says, "a most picturesque appearance, from its position at the gorge of the Crafnant river, which intersects it, and from the richness and thriving luxuriance of the extensive plantations that cover the sloping hills and craggy steeps of the adjoining districts. The turnpike road from Conway to Bettws passes through the lower part of the village.

"The whole *Vale of Conway*, and the numerous well-wooded glens and gorges through which the Conway receives its tributary streams from twenty-four lakes, teem with varied and picturesque landscapes ; and the undulating and ruggedly majestic range of mountains, where

those lakes are situated, along the sides or at the base of which numerous streams wend their foaming course seaward, command prospects and abound with views which, for magnificence and bold grandeur, cannot be surpassed in any part of the United Kingdom. The Vale of Conway, and districts adjoining it, present enticing lures, and teem with interesting objects calculated to attract the attention and suitably to gratify the respective tastes of geologists, botanists, artists, antiquarians, and the disciples of old Isaac Walton. All the lakes, rivers, and brooks, with which the district abounds, are amply stocked with fish, comprising salmon, sewins, samlets, gravelings, trout, sparlings, eels, and lampreys, of which immense quantities are annually taken respectively in their proper seasons." And besides this, rowing in small boats and coracles may be got on the river, and shooting in the woods. In fact, the neighbourhood abounds in means of pleasure and instruction.

WAYS AND CONVEYANCES TO TREFRIW.

Trefriw may be reached from Liverpool either by railway through Chester to Llanrwst, first-class fare thirteen shillings; in Summer, tourists' tickets for a month, twenty shillings, and thence to Trefriw by car: or by steamer to Rhyl or Llandudno, and thence by rail: or by rail to Conway, and thence by the small steamer that runs up the Conway river with the tide to Trefriw direct, and which is a delightful sail, and affords an excellent opportunity of viewing the waterfalls and scenery of the valley.

ACCOMMODATION AND LODGINGS.

There are two tolerably comfortable and well-conducted hotels—the Belle Vue and the Ship; and there are

many cottages to be let wholly or in part ; so that visitors may find lodgings very reasonable, such as the place affords ; but, as Dr. O. O. Roberts says, " it is not possible to estimate the immensity of the loss that the inhabitants of Trefriw, and the districts surrounding it, have sustained, and the disappointments and inconveniences that visitors have experienced from the want of suitable accommodations. Since the waters have been brought into public notice, the demand for accommodations has been regularly increasing ; and, from the want of such accommodations, scores upon scores of individuals who, by their residence, would have greatly benefitted themselves, and materially promoted the general prosperity of every one interested in that part of the country, were obliged to return disappointed, or to seek relief at some other *Spa.*" However, if Trefriw be full, there will be room at Llanrwst.

VERNON HOUSE,

LIVERPOOL, *May*, 1865.