Vichy and its therapeutical resources / by Prosser James.

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FREDERIK JAMES, M.D.

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AND ITS

THERAPEUTICAL RESOURCES.

BY

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PREFACE TO FIFTH EDITION.

THIS production has been out of print for many years, the previous issues having appeared in 1866, under the title of "A Visit to Vichy."

The present edition has been carefully corrected to date, the author having been at Vichy with a view to its preparation as late as last season.

Many passages which possessed only a temporary interest, or which are no longer applicable, have been omitted. On the other hand, numerous additions have been made, especially in the chapters on the properties and uses of the mineral waters. In accordance with this enlarged scope, the title has been changed.

P. J.

3, DEAN STREET, PARK LANE, W.,
March, 1883.

PREFACE TO FIRST EDITION.

THE following pages, hastily put together amidst the fatigues of travelling, contain an account of the mineral waters of Vichy and their medicinal uses, as well as an outline of the treatment usually practised at the springs, and the maladies in which it is mostly prescribed.

It has not been deemed necessary to enter into a detailed examination of the theories which have from time to time been proposed as to the mode of action of this class of remedies on the human system. Further, numerous points insisted upon by French writers on Vichy have been simply enumerated or altogether passed over.

The object of the publication is to furnish such special information on the leading French Spa as may be useful to the English practitioner, so that a mere reference frequently takes the place of extended explanations.

The few comments interspersed are so condensed as to leave the pamphlet at least the merit of brevity. Whether the author has succeeded in imparting to it clearness the reader will judge. He hopes it will be found to contain all that is necessary on the subject. For what is superfluous, provided it relieve the dullness of other details, he will probably receive the same measure of indulgence that has been accorded to his other productions.

December, 1865.

By the same Author.

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VICHY.

CHAPTER I.

THE THERMAL ESTABLISHMENT—THE MINERAL SPRINGS.

VICHY is 220 miles—eight hours by rail—south of Paris, and lies in a pleasant valley, 800 feet above the sea-level, on the right bank of the Allier, just before that river receives the smaller stream of the Sichon. Every year thousands of invalids resort to the town in order to take the thermal baths and drink at the alkaline springs. These springs, as well as the buildings in which the waters are utilised, belong to the State, but are leased by the *Compagnie Fermière*. On my first visit, in 1865, the late M. Callou, then Director of the Company, kindly acted as my guide in exploring the spa, and placed at my disposal every facility for studying its resources. The following description, though then first written, has been so far modified as to accord with the changes brought about in the subsequent period, and verified by a visit as late as last season.

The Thermal Establishment is the centre around which all the life of Vichy revolves. No hesitation,

then, as to where to commence our exploration. Leaving, therefore, one of the numerous well-appointed hotels, we crossed the miniature park, and entered the building. It is quadrangular in form—this side being supported on pillars, above which the twenty windows of the upper story look upon the narrower end of the Park. Passing beneath the central columns and ascending a couple of steps, we enter the picture gallery, nearly 250 feet long, forming a sort of transept to the building, of which it occupies the whole length. Its walls are covered with paintings, and it is always open to the public. Left and right extend long corridors as far as the other end of the building, and on each side of these corridors the doors of the small bathing-rooms are seen, each with its number, and above each a little bell to summon the attendant. At the other end of the picture gallery, and at right angles with it, forming what may be considered the front of the building, is the "Gallery of the Springs"—a sort of portico supported on columns—where, at intervals, for free consumption, are some of the mineral waters. They are conducted hither in tubes direct from the earth;—around the orifice of each is a basin, so that they have all the appearance of fountains. Glasses, as well as girls in attendance to wash them and fill them fresh for each person inclined to drink, are also provided.

Turning to the right on issuing from the picture gallery, and passing to the end of the corridor, we reach in the corner the principal spring of Vichy,

called *Grande Grille,* on account of a large iron fence with which it was at one period surrounded. There is nothing particularly striking in it—a large fountain-basin, as it were, in the centre of which water, and that not very clear, is copiously bubbling up. There is, however, a perceptible warmth, as of vapour, in the atmosphere around. Touching the waste water in the basin, it is warm. Stretching forth the ladle that lies for use—but, stay, the girl in attendance puts forth her hand to do it for you with her "Veuillez boire, Monsieur, Madame," fills with this long ladle a tumbler, and presents it to you to taste. It is hot, soapy, at first nauseous, but the taste is soon acquired. Observe, that this young woman takes special care to fill the glass from the very centre of the bubbling stream, so that you may take the medicine just as it comes from the bowels of mother earth, before it has had time to change in temperature or any other quality. Though paid by the company, the visitor who spends a season and drinks the water daily—and some take many glasses a-day—usually presents, on leaving, a *souvenir* in the shape of coin to the girl at the spring from which he drinks. She is also permitted, for those who desire it, to sell tumblers graduated for measuring the exact dose, and keeps them on separate pegs exclusively for the purchaser's use.

Glancing at the people as they crowd after each other to take their draughts, the reputation of this spring is stamped upon the countenances of its patrons, and the same remark is equally appli-

cable to the other springs. The Grande Grille is strongly recommended for chronic diseases of the liver, spleen, pancreas, and other abdominal viscera; and here the really ill, as distinguished from the mere idlers and pleasure-seekers, are of the various shades of pale, sallow, or yellow, combined with the peculiar physiognomy mostly apparent in patients whose ailments are referable to the organs of this great cavity.

At the opposite end of the gallery is the spring called *Mesdames*, presenting many points of contrast. It is nearly cold, instead of hot; it does not come up in nearly such large quantity. The actual spring is not immediately underneath, but at a considerable distance — the water being brought hither in tubes. The centre of the font, as well as the ladle, are coated with a precipitate of iron. At the invitation of the presiding nymph, taste, and you will find a cool, inky draught in place of the former hot, soapy one. Then the faces of the devotees at this shrine wear altogether a different aspect. It is as a chalybeate that it is most sought; not that the water does not contain the same alkali, but, in consequence of the iron found in it, the medicinal virtue of this metal is supposed to be superadded. In place of the middle-aged, worn-out, sallow-yellow face of abdominal organic mischief, we accordingly meet here the fragile frame of anæmia and protracted convalescence: young girls, growing too fast, or whose blood-making powers are inferior to the demand made upon them.

Between these two—say about the middle of the gallery—is another spring, named *Chomel*, after the physician who first described its peculiarities. This water is warm, and its taste more simply sodaic. It is destitute of any chalybeate or other peculiar ingredient, and those for whom it is mostly prescribed do not carry their maladies so distinctly in their countenances. It is celebrated for certain disorders of the stomach, and is said to agree when none of the other waters can be taken, so that it is often recommended in cases of doubt, or where there seems some slight contra-indication to the treatment. We observe, also, that this spring is not a fountain. In place of the basin, here is a small pump, by which the water is raised as required to this elevation, but which, as soon as you approach, a girl in charge begins to work, so that she may offer you a glass pure and fresh from the depth of the well below.

The above are the only springs in this gallery—the others are more distant. It will, however, be convenient to name the principal ones in this place. There is one in the middle of the Park called *Source du Parc.* Its characteristic ingredient is a minute portion of sulphuretted hydrogen, imparting to it a mild flavour of rotten eggs—just as if a dash of Harrogate water had been mixed with one of the Vichy springs.

Farther off, on the opposite side of the Park, through which we may walk to it, is the Hospital spring, in the centre of an open space called the "Place Rosalie," and in front of the Hospital. It

is in great repute for certain very chronic derangements of the chylopoietic viscera in nervous or delicate patients, and is said to be more easily digested than the Grande Grille. The class of persons frequenting it varies much from those named above. On the steps leading up to the cupola which protects it, you encounter the most elaborate toilettes of the fair sex, the faces of men stamped with the wear and tear of town life and the exhaustion of pleasure-seeking and fashion, as well as numerous tourists and idlers sipping the water as a part of their natural employment while staying at Vichy, while here and there care or hard brain-work seems to have driven the patient to this remedy. At this spring Napoleon III. mostly drank, and of course his Court followed suit: it is probably the most popular of all at the present day—unless the *Célestins* should still bear off the palm. It may be worthy of note here, that, on the surface of the large basin which surrounds this fountain, a quantity of green scum is particularly observable—only confervæ, such as would be seen on any water, says one; a substance altogether different, and only to be met with in the Hospital spring of Vichy, say others. We need not stay to enter into this controversy—which is already sufficiently embittered. Let the *savans* of Vichy decide the point—being on the spot and possessing the needful data.

Walking still farther away from the establishment, almost the same distance as already traversed, we shall come to the two springs named

Célestins, after the monks of that Order, in whose grounds they were situated, serving as a great attraction to their monastery, the ruins of which still remain. The Célestins, perhaps, are the most celebrated of all the springs of Vichy; they are cold, highly charged with gas and salines, and quite agreeable to the taste; to drink them is something like taking a bottle of soda-water. They have been used by some in the greatest excess, the number of tumblers consumed daily by enthusiastic patrons being almost incredible. At present this folly is abating. Vichy water is a potent remedy, and an abuse of it likely to lead to serious consequences. The Célestins are mostly recommended for gout and diseases of the kidneys and bladder, are very efficacious in some forms of gravel, and have been tried with success in albuminuria and diabetes. This water is said to be endowed with stimulant qualities, and Dr. Durand Fardel* relates a case in which he thought it produced a sort of intoxication. The confirmed toper would, however, probably be very slightly inebriated by the largest doses, and even the most susceptible victim of hysteria or the most excitable of nervous invalids need not fear to taste it. Perhaps the monks selected the spot for their monastery from a profound respect for the quality of the water—an explanation this, too, of the obstinate battles waged in the middle ages for possession of this building, situate, as it was,

* "Lettres médicales sur Vichy;" Paris, 1860.

in the midst of a country producing wine of no great strength or bouquet. It almost belongs to the propriety of things that the gardens in which it is placed should now be the *rendezvous* of the gouty and other elderly free-living gentlemen, who here congregate and partake of this substitute for their fine "old crusty port." These devotees are accommodated also with a sheltered divan, where they may rest, read the paper, take their coffee and cigar, and talk over their progress and the virtues of the water with their fellow-worshippers. The view from the grounds and the situation altogether is one of the most picturesque in the neighbourhood, and the enormous rock whence flows the stream is an interesting subject of geological speculation.

Close by is the *Lardy*—an artesian well, 450 feet deep. This water contains about the same quantity of iron as the Mesdames spring, and is employed in similar cases. It may be noted, however, that it is conveyed to the surface in an iron tube, from which it is possible the metal it contains may be derived. It is highly charged with gas, and bears transportation well.

The *Hauterive* springs are situated at the village of that name, on the other side of the Allier, about three miles distant. They furnish a typical Vichy water, which in composition is most allied to the Célestins, for which it may be advantageously substituted. Indeed, the learned Inspector of these springs, Dr. Durand Fardel, considers that Hauterive may usually replace any of the other

waters. Though it is highly charged with carbonic acid, he has never known it produce the stimulant qualities mentioned above. Like the Célestins, it is cold, 57·2° Fahr., and well adapted for exportation.

There are other springs, mostly used for the baths, which it is not necessary to describe. The *Vaisse*, however, which is also on the left bank of the Allier, may be mentioned as a curiosity, inasmuch as its water juts forth at regular intervals of fifty minutes, each appearance being preceded by subterranean noises.

With regard to the temperature of the Vichy springs, the Puits-Carré, which is only used for baths, is the warmest—it gives a temperature of 45° Centigrade, 113° Fahrenheit. The Grande Grille has a temperature of full 41° Centigrade, 105·8° Fahrenheit; Chomel, 44° to 44·7° Centigrade, say 112° Fahrenheit; Hospital, 31° Centigrade 87·8° Fahrenheit; Park, 18° Centigrade, 64·4° Fahrenheit; Célestins, 14° and 15° Centigrade, 57·2° and 59° Fahrenheit. The Hauterive springs about the same, and the Lardy 23·6° Centigrade, about 74° Fahrenheit.

CHAPTER II.

THE THERMAL ESTABLISHMENT AND ITS DEPENDENCIES.

To return to the establishment, from which we have thus far wandered. On the first floor of the building, at the time of my first visit (1865), there were large, lofty saloons, where, every day during the season, a ball, concert, or other entertainment was provided at a low price by the Company. Here, also, were reading-rooms, smoking-rooms, conversation-rooms, and a small theatre supplied by Parisian performers, the plot of the play being generally laid at Vichy. During the next summer a handsome new Casino was opened at the opposite corner of the Park, and to it all the amusements have been transferred, so that the whole of the spacious first floor of the establishment is utilised for the actual business of the Company. Descending to the most important part, it is worth while to enter some of the bath-rooms, and witness the air of comfort and cleanliness they present. There are ninety-six of these little rooms, dispersed round two square gardens, so that each can obtain fresh air and an agreeable view without being overlooked. They are well furnished and lofty.

A window into each garden gives the light to the picture gallery—the set on one side of this division being devoted to ladies' baths, and the opposite one to those for gentlemen. Besides these baths, there are many shower baths and various kinds of douches. Nor should the carbonic acid bath be omitted. This may be taken with the clothes on; it consists of an ordinary slipper bath with a cover; the gas is brought by pipes from the Chomel spring, and can be turned on by an ordinary tap. The patient reclines in the bath, the attendant puts on the cover, leaving the head only outside; further protection is ensured by the neck being closely enveloped in flannel so as to prevent the egress of the gas. Local baths of carbonic acid are also employed, the gas being directed on to the part affected by tubes of appropriate size; and these have been found useful in neuralgia. In fact, the system of employing carbonic acid is now in use at Vichy as at some other spas. A glimpse at the pulverisation-room will suffice. Here the waters are atomised, pulverised, or reduced to the form of spray, in order to be inhaled. Here, too, are kept in stock all other bottled mineral waters that are likely to be useful accessories to the treatment. It is, therefore, practicable to employ during a Vichy course any other mineral water that may be prescribed in the form of atomised inhalations.

Oxygen inhalation has more recently been added to the accessory therapeutical measures available at Vichy. This gas is prepared in the

usual manner, and kept ready in a gasometer. At the time of inhalation it is passed through a solution of benzoin, which gives it an agreeable flavour. The inhalation of oxygen is said to be a very valuable adjuvant to the Vichy course in diabetes, dyspepsia, and other conditions. It would seem to further increase the tissue changes, which, as we shall see, are stimulated by the alkaline treatment. When this agrees, the appetite keeps pace with the rapid metamorphosis, and thus the general nutrition is more than maintained. It is stated that the red globules of the blood are observed to rapidly increase under the use of these inhalations.

Leaving the building by the western door, we observe opposite us, divided only by the street, another of similar dimensions and shape, but without the upper story. That contains the second-class baths, and is arranged in a similar manner to the other. It was erected in 1858; contains 198 bathing-rooms and twenty douches—enough for 2,000 baths in a day of twelve hours. The second-class rooms are rather less elegantly furnished, but are clean and comfortable, and contain everything that is necessary. We should also have stated that there are two piscines or large baths where a number of patients may bathe together—swimming baths, in fact. Since 1863, there have been added to this edifice twenty-four third-class baths for the sick poor, at sixpence each, linen included.

In order to supply the baths, the waters of the

several springs are conducted by pipes to a huge tank, where they freely mix together. Thence they are raised by steam pumps to the top of a tower. The engine, of ninety horse-power, also raises fresh water to the same level. A visit to these tanks and to the engine proved very interesting. To raise the water, it takes a force equal to twenty-four horses—the surplus power being employed to heat the fresh water to a proper temperature, to keep in motion the machinery in the laundry, and for other purposes of the establishment. In the height of the season, this engine works night and day to keep up the needful supply of water. As many as 4,000 baths can thus be given in one day.

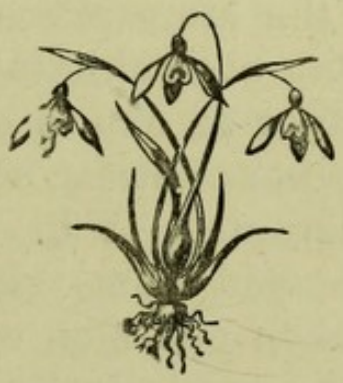
For these, a laundry on a surprising scale is necessary. The quantity of linen to be seen is simply inconceivable—linen, too, of a texture which would do many a housewife's heart good to handle. We inspected a series of shelves, estimated by my guide to contain between £6,000 and £7,000 worth of towels and other linen articles in daily use. A point, also, of considerable importance in this department is that, after three years' wear or so, the whole of this must be renewed. Some of it was shown us which was as friable as paper—the effect of its continual soaking in the alkaline waters. The washing is done by steam. As soon as the bather leaves the four or five pieces he has used, they are taken to the laundry, and passed successively through several copper cauldrons, in which they are kept in motion by steam, and so

their impurities rinsed out. A particular description of the whole process would not interest many readers. Suffice it to say, that, when clean, they are taken into an upper room, round which pipes are laid carrying the waste steam. This heats the room sufficiently to dry the linen—as the moisture is carried up a flue by the ingress of fresh air being provided for from below. Description can give but a feeble idea of the extent of this laundry, and we soon descended from the drying-room, the heat of which was oppressive, and only relieved by the fierce current near the flue—a current, we were assured, strong enough to tear off any lady's clothes who should be rash enough to approach too near.

Before closing this chapter, it may be well to mention what is usually understood by the expression "a course of Vichy treatment." The patients who undergo "the cure" at Vichy take a bath daily for three weeks or a month. Drinking from one of the springs is generally prescribed at the same time. Occasionally, a second course of treatment is tried at a later period of the year, or—if the first have been at the close of the season—early the ensuing one.

The *season* at Vichy extends from May to September inclusive; but the establishment is open throughout the year, and many who cannot go in summer might, with advantage, try a course in winter. Of course, there is not much society or amusement in winter; but the establishment is maintained at an equable temperature, and an

orangery serves as a promenade. Some persons would doubtless derive all the benefits; but summer is undoubtedly the pleasantest time for bathing, and the attractions of the place are, to many, increased by the throngs of visitors.



CHAPTER III.

DEPENDENCIES OF THE THERMAL ESTABLISHMENT.

WE next went to see the manufacture of the Vichy salts and lozenges, to which a separate set of buildings is devoted. For this purpose, the mineral water is evaporated in enormous reservoirs, and the solid ingredients collected and dried. This process is rather curious, and demands a word of explanation. Entering the room where the last part of it is carried on, you may walk freely about the planks which are laid across the huge boilers of heated water, the atmosphere of this vapour-bath being anything but exhilarating. The tanks are so arranged that as one is emptied it can be filled from the one next hottest, so that the process need not be interrupted. The hottest of all is next to the door—and from this, as soon as the salts begin to thicken out, men with large wooden shovels take out the precipitate and throw it down a funnel to a room beneath, where, after drying, it is packed for exportation in little cylinders. This is but one part of the process; this residuary salt is only employed for making baths. The finer crystals used for the lozenges, or pastilles, as the French call them, are separated at an earlier stage. The water, being conducted into large open vessels,

first of all cools and looses its carbonic acid, so that the more insoluble salts of lime gradually subside. It is only then that the water is heated until the degree of concentration is reached at which the carbonate of soda begins to crystallise. It is now placed in large open stone reservoirs, and, after the soda has all separated, the water is conveyed to the room where the remaining salts are extracted for baths. From the above facts, it will be obvious that the finer, whiter crystals, which are preserved for the lozenges, consist entirely of carbonate of soda. This substance is then placed in a room filled with carbonic acid, brought direct from one of the springs, in order to re-convert it into the *bi*-carbonate. Even then, supposing the latter combination to be perfectly effected, it can scarcely differ from the ordinary bicarbonate of soda of commerce, and whatever other solid matter exists in Vichy water would naturally go to the residue, which is exported as the salts for baths. From a chemical point of view, this idea is so natural that I could not help suggesting it to my guide, the director of this great enterprise, adding that the whole might as well go to the baths, and bicarbonate of soda be purchased in an ordinary way for the manufacture of lozenges. This observation led to an explanation, which may as well be summarised in this place, as it will assist the understanding of much to follow. The springs of Vichy are State property, as well as all the buildings, &c. They are leased for a term of years by a company, but

during the lease certain restrictions are imposed. The products may be utilised in any manner, but may not be adulterated or *mixed with* anything, and a Government inspector is charged to see that these regulations are adhered to to the letter. The whole establishment is under State control, and, to prevent fraud and give the purchasers the best guarantee, no bottle of Vichy water is sold without the proper label—no lozenges are allowed to leave the premises, except in particular boxes, labelled, closed, and sealed in a manner to prevent their being opened, except by the purchaser. These boxes are made on the premises, giving employment to a number of young girls. The cardboard is cut into bands for the sides by a sort of chaff-cutter; another implement cuts out the oval top and bottom of the box. These, fitted together and lined with white paper, are left to dry, and then filled and labelled. Each box is surrounded by a peculiar band, under which is confined a piece of string; the ends of this are enclosed in a small seal of lead, on pulling which the string cuts through the band, and so opens the box, the lid of which would afford some difficulty to raise but for this ingenious little contrivance, so firmly does the band paste it down.

We have yet to see the actual manufacturing of the lozenges, and here the general air of cleanliness which prevails is at once apparent. The loaves of sugar are cut by a circular saw into slices, and these are thrown into a mortar, the pestle of which is kept revolving by a band from

the steam-engine. The requisite quantity of the salts, the extraction of which from the water has just been described, together with sufficient gum, is added. When these are thoroughly mixed, the next stage of converting the powder into paste, by means of water, is accomplished, and the mass is handed over to numbers of men, who, with polished steel rolling-pins, roll it into flat layers on the marble slabs which surround the room. The general appearance of the apartment is that of a baker's or a confectioner's. The layers of paste of proper thickness are placed upon a flap of the machine, which is regularly projected and withdrawn for this purpose. As it retires, it passes under the sharp cutters, which descend upon it, and, in a moment, divide it into a number of lozenges. These are set aside to dry, and the fragments which are necessarily left are added to the next portion of paste as it is kneaded. The engine devoted to the lozenge-making is of twenty-four horse-power, and above a hundred thousand lozenges can be turned out in a day.

We may now look at the bottling department, which is conducted on an enormous scale, and in which a number of ingenious contrivances were pointed out. Each bottle is filled from a tap, to which the water comes fresh from the spring, a cork being immediately thrust in by a machine for the purpose, similar to those of our soda-water factories. The man who controls this passes the corked bottle to another close by, who sees that the cork is level, puts a little resin to it from a

kind of glue-pot by his side, and passes it on to a man who places on it a capsule, on which is printed the name of the spring and the year when the bottle is filled. This capsule is ingeniously fastened by passing it into a loop of string, which, on being turned round, closes it tightly upon the neck of the bottle. It is then handed on again to another man, who affixes the label. After this, it has to be placed in a covering of straw—such as we sometimes see certain wines come to this country in—and then packed in cases ready to export. This mode of packing is rather more expensive, but, in practice, is economical, from its preventing breakage. These straw cases for the bottles are all made on the premises, as are the boxes in which they are packed. The bottled Vichy waters are sent not only to all countries of Europe, but to the most distant colonies, and their sale is continually increasing. Thus the town derives wealth, not only from its Thermal Establishment, but from the great trade carried on in its products, from which more than 500 persons find regular employment. In 1882 no less than 40,500 persons visited Vichy, the number of baths given being 180,000; while 5,137,559 bottles of the water were exported.

CHAPTER IV.

THE ORIGIN OF THE MINERAL SPRINGS.

WE have now inspected the ordinary sights of Vichy, but all these preliminaries pale in interest before an expedition to the actual springs, where the mineral waters come up fresh and hot from the bowels of the earth, and are thence conducted by human ingenuity to serve the purposes of the company. Accompanied by the director, who kindly undertook the duty of guide, and by a lady—the first lady, he told us, who had made this expedition—I descended the necessary steps, preceded and followed by boys with lanterns, to explore the dark subterranean caverns. Under all the buildings described, and far beyond, do the engineering operations of Vichy extend, and we marched one by one under long ranges of arches where daylight never comes—under the picture gallery—under the corridors—under the long ranges of bath-rooms—transversely, directly, and I know not how else besides nor yet whereunder—but at any rate on—on, under

"Arches on arches—piles on piles extending,"

till at last we came to the *Puits Carré,* as it is called. It is a large square well, as the name

implies, where continuously comes bubbling up the hot water, filling the tunnels all along with its heat and steam—in fact, we were in a complete vapour-bath, but more than usually oppressive from the gas which escaped. A light let down a little way was instantly extinguished by the free carbonic acid rapidly disengaged—although a large cone is placed over the well to carry away as much gas as possible to the carbonic acid bath-room, and to the room of the lozenge department already noticed. Nevertheless, we felt the oppression much, and hastened away through more long galleries—much cooler and less oppressive—till at length, as they again got warmer and warmer, we were nearing another spring. This was the *Grande Grille*. We stood some twenty feet away, and watched it for a few minutes pouring out from a height of three or four feet its uninterrupted supply of hot water; looking at this, as it flowed in a large stream just by our feet into pipes which conducted it away, we felt it was not an exaggerated statement that from this spring flow daily 240,000 litres of water at a temperature of 107° to 108° Fahrenheit. After gazing a few moments at this wondrous stream, we passed on—or backwards—along similar, or perhaps the same, subterranean passages for some distance, where it was cool—indeed, after the previous heat, cold; then it got warmer again, and we came to the large reservoirs where the major part of the water from all the springs is conducted, and all kinds freely mix together. The heat was terribly op-

pressive, but we looked steadily as the little lanterns blinked beside the dark caverns. Leaving the lady with the torch boys, my guide, with one lantern, preceded me on a narrow plank across one of those great cisterns to see where the pumps of the steam-engine took the water from to force to the tower. I shall not readily forget my sensations here. On the other side, so thick was the darkness, the lanterns were only seen like sparks a long way off—so far it seemed, nothing was easier than to fancy that our companion had started back and gone a long way along the caverns; but not so—only we had moved. As the eyes became a little accustomed to the place, my guide holding down the lantern to the surface of the water, I could discern—stretched out beneath my feet on each side, and only separated by a thin plank—the surface of the water with some of its green scum upon it, otherwise black as night; but no boundaries were visible—the feeble rays of the light were lost in the darkness, so I could not see the size of the cistern, nor the height of its vaulted roof—only darkness above and all around—only the feeblest flickering of a kind of spark or two to indicate which way we must return—and our own little lantern to show us step by step of the plank by which we must get back from this tremendously hot and oppressive, vapour-loaded air. Altogether, it was a grim situation—the dark water below seemed meet type of the shoreless sea of oblivion, and the little scum on its hot surface might stand for human woes and passions, while

this atmosphere of heavy vapour, loading all the senses, and almost forcing one to fall into the abyss below, was but a feeble image of the sighs and groans of our suffering humanity. When we returned to the lady, the hot air which she declared almost stifled her seemed to us cool and fresh. Then we wended our way to cooler and fresher still—then a glimmering of light began, and the freshness and coolness and light increased till we again came safely above ground.

CHAPTER V.

HISTORY OF THE SPA.

AFTER the foregoing sketch of its Thermal Establishment, a few words on the history of Vichy may not be devoid of interest. The town and the use of its mineral waters claim considerable antiquity. Some champions go so far as to trace the pedigree of its name to the Druidic *gwich* or *wich*, which may be translated *virtue*, *force*, or *strength*, the letter *y* merely standing for the French *eau* — water. Water of virtue, then — medicinal virtue, no doubt, understood. Like many long pedigrees, this is not quite satisfactory to all heralds. The more moderate enthusiasts content themselves with a derivation from the Latin *vicus calidus*, hot village, and the place is designated *aquæ calidæ* in the Theodosian table. It is said that Cæsar crossed the Allier at this point on his return from Gergobia to Roanne. The old Roman road passes in this direction, and there is a tradition that on a wooden bridge at this place he rested a short time on his weary route. In this practical age the finding of Roman remains, including baths, statuettes, and coins, furnishes the best title to its antiquity. Medals bearing the

impress of Augustus, Agrippa, Claudius, and other Roman Emperors have been found.

Writers on this subject have supposed that the Romans erected buildings here which were destroyed by the Northern barbarians in their devastation of Gaul. Even if they did not destroy them, they would certainly take no care to preserve them, and so they would fall into decay.

Coiffier, in his "Histoire du Bourbonnais," states that Vichy sustained a siege in the twelfth century. A little later the name of the place seems to have been borne by the chief landowner of the locality. The lands of this family were confiscated by the Crown towards the fifteenth century.

Louis XI., when *Duc de Bourbon*, commenced building walls and towers, one of which now remains, and in 1410 he founded the monastery of the Célestins.

In 1446, Vichy was taken by Charles VII. from his son, the *Duc de Bourbon*, who thereupon retired to Cusset, where an interview and reconciliation took place, to the great relief of the people, who suffered from these civil conflicts.

Vichy continued to play a part in the subsequent struggles of the next two centuries—the monastery being for the most part the centre of the most obstinate battles.

In 1603, Medical Inspectors were appointed by the Crown to superintend the administration of the baths. A few years afterwards, another Order of monks, the Capucins, installed themselves in

proximity to the establishment, and received their invalid brethren who came to Vichy for treatment.

In 1696, Louis XIV. created, by letters patent, an hospital for the poor—since removed to its present site on the *Place Rosalie.*

In 1676, Madame de Sévigné came to try the effect of the mineral waters, and here wrote those charming letters which have made the valley of the Sichon known wherever the French language is read.

Not till the visit of Mesdames Adelaide and Victoire, aunts of Louis XVI., in 1787, was there any real progress. Up to this date one little building, called the "king's house," served all the purposes of the place. These illustrious ladies resolved to remedy some of the defects they could not but notice, and so became the founders of modern Vichy. There had hitherto been no walks or drives; rich and poor alike frequented inns which even French writers describe as miserable, and which, we may therefore conclude, must have been—well, say indescribable. Each in turn took the bath as it was vacated, men and women using the same. The Revolution suddenly put a stop to the efforts of "the ladies of France," and few reforms could be effected until 1805, when the whole became the property of the State.

During the Russian campaign, Napoleon I. decreed to Vichy a sum of money, with which some adjoining houses were added to the property.

The Duchess of Angoulême visited Vichy in

1814, and laid the foundation-stone of the existing edifice, but this was not finished until 1829. In the following year, the revolution of July put a sudden end to the second visit of this lady, who fled from here into long exile.

Some improvements were carried out by the Government in 1846, but not until Napoleon III. began to take an interest in Vichy, and visited it for health, did that impetus commence which has placed it at the head of all European spas—a position which under the present management it is likely to maintain.

CHAPTER VI.

ENVIRONS OF VICHY.

THE neighbourhood of Vichy abounds in interest both to the tourist and invalid, affording, as it does, a great variety of walking, riding, and driving excursions. Numerous are the quiet, sequestered nooks where a picnic would be sure to succeed.

The Allée de Mesdames is, perhaps, the favourite resort, and certainly for beauty well deserves the praises that have been lavished upon it. It is a magnificent avenue of fine poplars, where shade can always be had combined with pure fresh air, fragrant flowers, and lovely scenery—a thoroughly rural walk close to the town. This avenue leads to Cusset, about three kilomètres from Vichy.

Cusset is situated between two streams, the Sichon and the Jolan, and surrounded on every side, except the west, by hills. It is an ancient town, its history going back to the ninth century, and its name has been traced by some to the old Celtic *cuzey*—hidden—in consequence of its position among the hills. Here it was that Charles VII. met his son, and the house in which that important interview took place is shown to the curious. Here, also, are the ruins of one of the four towers which defended in bygone times the four gates. There are some large open parts where a pleasant

walk may be had; the older part of the town consists of damp, narrow streets. Cusset possesses three mineral springs in which there is a chalybeate element, and these, with corn and oil, are its only sources of prosperity. Driving through it to L'Ardoisière, about nine kilomètres, is one of the best excursions. The road follows pretty closely the course of the river, and we could not fail to be delighted with the scenery. Between verdure-clad hills, sloping away in various directions, the Sichon wends its way to the Allier—now, in gentle, noiseless, lake-like calmness, creeping imperceptibly between fragrant gardens; anon, as a talkative torrent, hurrying over a narrower pebbly bed; while now and then, leaping down a sudden declivity, the noise of its little waterfalls mingles with the music of the feathered tribes and the hum of the insect world.

The hills in some places rise close to the road; at others, they retire far enough to leave a green plain, which reminded us of English landscapes. Some of our party considered this valley to rival some of the prettiest Swiss scenery.

L'Ardoisière is only the remains of a slate quarry. There is nothing to see—but we were sufficiently accustomed to this kind of result to expeditions to be satisfied with the scenery through which we had passed. The slate is not of good enough quality to pay for working, so on the property a little *café* or hotel has been fitted up where the visitor can obtain refreshments when he has walked over the grounds and seen the inevit-

able sights. The whole is, in fact, a sort of public tea-gardens; there is even a pagoda for music. At one extremity of the gardens is a secluded avenue leading to a pretty waterfall. This also is one of the necessary sights. Our Continental friends have either an excessively keen eye for the beautiful, as well as the curious and rare, or a very poor opinion of John Bull's judgment; for they never fail to find something for him to see, and, having seen, to pay for. A house in which some one was born or died, a ruin which may have been a castle or may not, a convent, a church—anything, in short, which can be seen is called a sight, and serves the purpose of extracting a franc from the well-filled purse of the credulous traveller. Every village has its monuments, and, failing these, the scenery of the valley or mountain can be done at a moderate tariff. It is the same story here. As in duty bound, we followed the boy, who carried a lighted candle, into a dark cave, until we came to a well said to be of awful depth, now full of water, and surrounded by a wall to prevent adventurous spirits from falling in. The boy considerately walked round, that by the distance of his candle we might judge of its size, and the sight was over. There was nothing else—not even a ghost—nor a story of any one killed before the wall was built—nor could the guide tell us how long it is since the quarry was worked. But we could not satisfy him without going; we should have shocked not a few by visiting Vichy and not seeing L'Ardoisière. These gardens are thoroughly thronged in the

season, and are really agreeably laid out. On the summit of a lofty hill which bounds them on one side stands the ruin of a castle, said to have belonged to the Templars. It is a long, weary road to reach it, so, though the view from it must be extensive, we concluded to be content with our day's excursion, thinking there would be plenty of other sights more accessible.

LA MONTAGNE VERTE. Another favourite trip is to the summit of this "Green Hill." The road, which is available for carriages, passes near the spot where the Sichon empties itself into the Allier, then ascends gradually through vineyards to a plateau crowned by a "kiosque," where the visitor can find something to eat and drink while contemplating the valley of Vichy, with its woods and plantations, intersected by the streams that descend from the distant ranges of mountains which bound the view.

Among the numerous other excursions which may be made, we ought not to omit that to the CHATEAU RANDON, said to have been erected in the sixth century by some monks. In the twelfth century it became a feudal stronghold. In 1821 it was bought by Princess Adelaide, sister of Louis-Philippe. A mile or two beyond this is the CHATEAU MAUMONT—the hunting *rendezvous* of the nephews of the same princess.

There are plenty of other walks, rides, and drives —indeed, the facility for this kind of enjoyment is a great recommendation to Vichy as a health resort. The constant outdoor exercise, breathing

of pure, fresh, bracing air, and the exhilarating influence of attractive scenery no doubt contribute their quota to the cures effected.

HAUTERIVE and CHATELDON may be particularised, as each of these places possesses mineral springs. Hauterive is only a village about three miles off; its spring contributes some eighty-six cubic mètres of mineral water daily to the establishment, at a temperature of thirteen or fourteen degrees Centigrade. This water is considered to be specially adapted for exportation.

Châteldon, eighteen or twenty miles from Vichy, is situated at the foot of a granite rock. The village is a jumble of houses, in narrow, tortuous streets; a stream, called Vauziron, passes through, and keeps the basements of most of the buildings damp. Many of the inhabitants, more especially the women, are affected with goître—or Derbyshire neck. All the hill-sides of this neighbourhood are clothed with vineyards, which are said to produce the best wine of the Auvergne. An old castle, with its *oubliette*, or cell, in which the victims were left to starve, is the inevitable sight of the place. But its chief importance is derived from the two Chalybeate springs which supply its miniature establishment. The waters are mostly used internally, and, as they bear transport very well, do not attract so many visitors as might have been expected from Dr. Desbrest's description of their virtues.*

* "Nouvelles Recherches sur les Propriétés des Eaux minérales de Châteldon."

CHAPTER VII.

CHEMICAL PROPERTIES OF THE WATERS.

THE chemical composition of the water of the different springs at Vichy has long occupied the attention of observers. The analyses of M. Bouquet made in 1852, and published in a memoir addressed to the Academy of Sciences under the title of "Histoire chimique des Eaux de Vichy," are given in Tables I. and II., and they agree in the most essential particulars with the prior investigations of MM. Longchamp, Berthier and Puvis, and others. M. Ossian Henry, who was employed by the Government to examine the subject, reported the existence of iodine, bromine, and lithium in several of the springs. More recently, by means of spectrum analysis, M. Grandeau has found indications of rubidium and cæsium. Accepting the main conclusions of the most able chemists, we find the most important ingredients of Vichy water represented by two distinct sets of principles, acids and bases, as will be readily seen in Table II. Only two of these principles are to be met with in a free state—viz., carbonic acid and silica. All the other ingredients are in a state of combination; consequently, it is as salines that they enter into the

TABLE I.—FROM BOUQUET.

Quantities of Saline ingredients contained in each litre of the several Springs	Names of the Springs												
	Grande Grille	Chomel	Carré	Lucas	Hospital	Célestins	New Célestins	Park	Lardy	Vaisse	Hauterive	Saint-Yorre	Mesdames
Free Carbonic Acid	·908	·768	·876	1·751	1·067	1·049	1·299	1·555	1·750	1·968	2·183	1·333	1·908
Bicarb. of Soda	4·883	5·091	4·893	5·004	5·029	5·103	4·101	4·857	4·910	3·537	4·687	4·881	4·016
,, Potash	·352	·371	·378	·282	·440	·315	·231	·292	·527	·222	·189	·233	·189
,, Magnesia... ...	·303	·338	·335	·275	·200	·328	·554	·213	·238	·382	·501	·479	·425
,, Strontia	·303	·003	·003	·005	·005	·005	·005	·005	·005	·005	·003	·005	·003
,, Lime	·434	·427	·421	·545	·570	·462	·699	·614	·710	·601	·432	·514	·604
,, Protox. of Iron	·004	·004	·004	·004	·004	·004	·044	·004	·028	·004	·017	·010	·026
,, Manganese ...	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces
Sulphate of Soda	·291	·291	·291	·291	·291	·291	·314	·314	·314	·243	·291	·271	·250
Phosphate ,, ...	·130	·070	·028	·070	·046	·091	traces	·140	·081	·162	·046	traces	traces
Arseniate ,, ...	·002	·002	·002	·002	·002	·002	·003	·002	·003	·002	·002	·002	·003
Borate ,, ...	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces
Chloride of Sodium	·534	·534	·534	·518	·518	·534	·550	·550	·534	·508	·534	·518	·355
Silica	·070	·070	·068	·050	·050	·060	·065	·055	·065	·041	·071	·052	·032
Bituminous Matter	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces
Totals	7·914	7·959	7·833	8·797	8·222	8·244	7·865	8·601	9·165	7·755	8·956	8·298	7·811

TABLE II.—FROM BOUQUET.

Acids and Bases contained in each litre of the several Springs	Names of the Springs												
	Grande Grille	Chomel	Carré	Lucas	Hospital	Célestins	New Célestins	Park	Lardy	Vaisse	Hauterive	Saint-Yorre	Mesdames
Carbonic Acid	4·418	4·429	4·418	5·348	4·719	4·705	4·647	5·071	5·400	4·831	5·640	4·957	5·029
Sulphuric ,, ...	·164	·164	·164	·164	·164	·164	·177	·177	·177	·137	·164	·153	·141
Phosphoric ,, ...	·070	·038	·015	·038	·025	·050	traces	·076	·044	·088	·025	traces	traces
Arsenic ,, ...	·001	·001	·001	·001	·001	·001	·002	·001	·002	·001	·001	·001	·002
Boracic ,, ...	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces
Hydrochloric ,, ...	·334	·334	·334	·324	·324	·334	·344	·344	·334	·318	·334	·324	·222
Silica	·070	·070	·068	·050	·050	·060	·065	·055	·065	·041	·071	·052	·032
Protoxide of Iron	·002	·002	·002	·002	·002	·002	·020	·002	·013	·002	·008	—	·012
,, of Manganese ..	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces
Lime	·169	·166	·164	·212	·222	·180	·272	·239	·276	·265	·168	·200	·235
Strontia	·002	·002	·002	·003	·003	·003	·003	·003	·003	·003	·002	·003	·002
Magnesia	·097	·108	·107	·088	·064	·105	·177	·068	·076	·122	·160	·153	·136
Potash	·182	·192	·196	·146	·228	·163	·120	·151	·273	·115	·098	·121	·098
Soda	2·488	2·536	2·445	2·501	2·500	2·560	2·124	2·500	2·486	1·912	2·368	2·409	1·957
Bituminous Matter	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces	traces
Totals	7·997	8·042	7·916	8·877	8·302	8·327	7·951	8·687	9·248	7·835	9·039	8·378	7·866

constitution of Vichy water. Some of the ingredients are doubtless only held in solution by the large quantity of free carbonic acid, equal to about half the volume, and, as this gas escapes, are consequently precipitated. It is to the loss of this gas and of heat that the deposits around the fountains owe their existence. These incrustations sometimes cause considerable obstructions at the mouths of the springs. The most abundant compound of this acid is that with the base soda. The bicarbonate of soda it is, in fact, which gives the chemical characteristic to Vichy water, and on which its medicinal qualities mainly depend. The first Table shows, on the average, nearly five grammes of this salt in every litre of the water, which would equal about a scruple in each tumbler. The largest quantity is contained in the water of the Célestins spring, the smallest in that of Mesdames. The bicarbonates of potash, magnesia, and lime are present in greatly inferior quantities, and in a medicinal point of view are of little consequence. The ingredient to which the second degree of importance is attached is, perhaps, iron, of which traces are found in all the waters, and in those of Mesdames, Hauterive, and Lardy sufficient to be considered of value. The distribution of iron is curious enough to demand a passing notice, from its connection with the origin of mineral springs. Taking the Park as a centre, we may describe a circle, the radius of which shall not extend beyond the Célestins. In this space will be enclosed all the original springs of Vichy,

those which are simply alkaline in contra-distinction to those beyond the circumference of our centre, which are not only alkaline, but also Chalybeate. The Chalybeate waters are those obtained by artesian wells, or brought to the surface or from a distance in iron tubes, from which it may be conjectured they take up the small amount of the metal they contain. The Lardy is just outside our limit, and is, moreover, an artificial spring—an artesian well. Farther off still, at two kilomètres distance, is Mesdames, but the water, as we have seen, is taken to the establishment in tubes; another kilomètre beyond are the three springs of Cusset, all Chalybeate. Five or six kilomètres from Vichy are Hauterive and Saint-Yorre, while at twenty are the springs of Châteldon.

The phosphates and the arsenic, though in small quantities, must not be overlooked from a chemical point of view, though they can scarcely have much to do with the medicinal qualities of the water. Then the strontia and manganese, and perhaps lithia, will not fail to catch the attention of some readers. Henry, Lefort, and Chatin all found iodine, but it is not mentioned by Bouquet.

I have already alluded to the distinct odour of sulphuretted hydrogen perceptible in the water of the Park spring, and this is not the only one slightly impregnated with that gas, although none of the before-cited chemists seem to have met with it. M. Chevallier recognised its unmistakable odour, and MM. Prunelle and Baudrimont speak of a sulphurous principle about the Lucas. It is

possible that this gas may not be so constant a constituent as the solid ingredients, but any one ignoring its presence should certainly go to the spring and taste, or rather smell. The small quantity present would seem to be due to decomposition of the organic matter, for it is only the gas that is found, not the alkaline sulphides, which are so much more important as constituents of mineral waters. After exportation the gas is almost or entirely converted into other products. Besides the alkalies and other ingredients mentioned, it will be observed that the waters contain salts, which may be classed as salines and aperients to the average extent of 25 or 30 grains of the former and 16 to 18 of the latter.

Lastly, a few words on the substance that has been called "glairine." That a certain amount of organic matter should exist in all the waters might have been safely predicted, but that this is in any degree peculiar to Vichy is another question. Whether the green scum seen in some parts be ordinary *confervæ* or not would seem an easy question for residents to settle. This disputed substance has no appearance to distinguish it from that of every pond—nor is it seen except when the water is exposed to the air and stagnant, as in the immense basin of the Hospital spring; besides, it is never to be found in the bottled water. That the organic matter may be peculiar, and exercise some modifying influence over the other ingredients, though believed by many, cannot yet be admitted as proved.

The previously quoted analyses refer to the waters as they issue from the springs. That their composition remains unaltered after exportation is evident from the analyses which Professor Tichborne has made, for our recent account,* of the chemical and therapeutical properties of these among other bottled mineral waters. From his analyses I have compiled Table III., which shows the

TABLE III.

Ingredients per gallon of the Waters.	Grande Grille	Hauterive	Mesdames	Hospital	Park
Sodium, Bicarbonate ...	294·80	300·00	240·30	314·26	298·00
Potassium ,,	21·64	12·08	11·25	4·21	18·34
Magnesium, Carbonate...	18·62	32·03	26·31	12·32	13·00
Strontium ,,	19·01	0·19	0·20	0·26	0·41
Calcium ,,	26·68	27·62	36·01	36·00	38·23
Ferrous ,,	0·30	1·08	2·01	0·23	0·24
Manganese ,,	traces	traces	traces	traces	traces
Sodium, Sulphate ...	18·12	18·60	16·30	18·32	20·16
,, Phosphate ...	8·00	3·00	0·32	3·00	9·30
Arsenic	0·09	0·80	0·38	0·07	0·08
Boracic Acid	traces	traces	traces	traces	traces
Lithium Chloride... ...	traces	traces	traces	traces	traces
Sodium Chloride	32·82	34·15	21·14	32·32	28·57
Organic Matter	traces	traces	traces	traces	traces
Silica	4·00	4·43	2·00	3·08	2·80
Grains	444·08	433·26	356·22	447·00	429·13

amount of the salts he found present in those Vichy waters which he examined. On the whole, these analyses do not give so heavy a result as

* "Mineral Waters of Europe," by C. R. C. Tichborne, LL.D., and Prosser James, M.D., London, 1883.

former ones, but the difference is too slight to be important. Traces are noted of lithium, manganese, boracic acid, and organic matters just as before bottling. The amount of arsenic is not sufficient to constitute what may be called an arsenical water; in fact, there is not a maximum pharmacopœial dose in a gallon of either of the waters. The chief quality of the waters—the alkalinity—remains the same, depending principally on the bicarbonate of sodium, which is present in similar proportions, as also are the other salts. The amount of these last does not exceed three grains in a tumblerful of the water, and only one of them can be considered aperient. The following skeleton analysis, also compiled from the above cited reports, shows the amount of these ingredients:—

TABLE IV.

Ingredients per imperial half-pint of the Waters.	Grande Grille	Hauterive	Mesdames	Hospital	Park
Solids ... ... Grains	$27\frac{3}{4}$	27	22	$28\frac{1}{4}$	$26\frac{3}{4}$
Antacids ... ,,	24	$23\frac{1}{3}$	19	25	23
Salines ... ... ,,	2	2	1	2	1
Purgatives ... ,,	1	1	$1\frac{1}{3}$	1	$1\frac{1}{4}$

From what has preceded, it is clear that the chemical reactions of Vichy water should be those of the substances already indicated, and this will

be found to be the case, not only at the springs, but in the bottled exported waters. Knowing, then, pretty accurately, the composition of the substance, can we not make it by an artificial process? Would not the simple solution of the salts in water charged with carbonic acid furnish us with an equally perfect remedy? The question has been often asked and answered—negatively by most medical writers, affirmatively by parties who profess to manufacture a substitute. It is not necessary to enter profoundly into the question. Admitting that the bicarbonate of soda may be dissolved, together with the other ingredients, in the proper quantity of water, there are yet various sources of fallacy which make it impossible for us to assert that such an imitation possesses all the properties of the genuine Vichy waters. First of all, the analyses, though made by the most eminent chemists, cannot be regarded as absolutely perfect, since there are perceptible discrepancies in the results of different observers. Moreover, we cannot deny that some substances may escape the most careful analyst; lithium, though doubtless always present in minute quantity, was long undetected. Rubidium and cæsium have only recently been demonstrated by the spectrum. Secondly, the results of the analyst may, in some degree, be due to the processes of the laboratory—they may be the products of the analysis; besides which, the quantities of the several salts are in reality only hypothetically calculated from the acids and bases. If, then, some substances are too subtle to be

separated, and others may be present without giving reactions to our known tests, how can we aver of any imitation that it fairly represents the waters of the springs? There is another point to be noticed—viz., that the mere mixing together certain substances does not constitute the chemical compound. For example, we know very well the ingredients of wine, one of the most complex fluids; yet, by mixing alcohol, sugar, ethers, and other constitutents in the most correct proportions in the laboratory, we cannot produce a fluid which would pass for the product of the vineyard.

Such are the principal arguments against the use of *artificial* as substitutes for *natural* mineral waters. In this particular instance it is further stated by several authorities that the imitations of our mineral water factories will disagree with the stomach when a bottle of true Vichy water will be easily assimilated. It is not necessary to pursue this subject further—since the genuine products of the springs are within the reach of all invalids, and Englishmen are not likely to consume the factitious waters while the genuine are thus easily procurable.

CHAPTER VIII.

PHYSIOLOGICAL PROPERTIES OF THE WATERS.

INTIMATELY connected with the chemical reactions of Vichy water, and, in point of fact, to a large extent dependent upon them, are the experiments that have been made with a view to ascertain its effects upon organic tissues. M. Barthez* submitted portions of various textures to the action of ordinary water, and to that of the Célestins spring. He found that 200 grammes of fat immersed in a litre of ordinary water for six weeks, the water being changed once a fortnight, lost nothing in weight, and changed but little in appearance—only acquired an elastic, spongy nature. The same weight of fat treated in the same way by Vichy water, though losing no weight, was converted into stearine—a result that might have been anticipated by any one acquainted with the chemical composition of the liquid. Muscle lost 109 grammes of weight in Vichy—only 45 in common water. A portion of ox-liver of the same weight was subjected to a similar trial. In pure water it lost 95 grammes in weight, its colour and consistence remaining nearly the same; but of the portion acted upon by Vichy water, there only remained in the vessel a few grammes of

* "Guide pratique des Malades aux Eaux de Vichy;" 1861.

very soft, grayish, semi-fluid matter. The mucous membrane of the stomach was only slightly softened by common water, but reduced to a jelly by Vichy water. As long ago as 1755, we are informed by Tardy * that similar experiments had been made, and that de Mony found a pleuritic deposit completely dissolved by one day's maceration in Vichy water. M. Baron has also made a number of observations with a view to show that these waters can prevent the formation of the false membranes of croup and diphtheria—an idea which is supported by some experiments showing them to be capable of dissolving albuminous and fibrinous deposits. But all such experiments present one important defect; they take no cognizance of the difference between dead and living animal tissues. Now, during life, chemical must be subordinate to vital action; consequently, no experiment outside the living organism can accurately portray all the changes continually going on within. It would therefore be more to the purpose to inquire what effects the waters may produce on living animal tissues, what variations they may cause in the functional activity of complex organs, and what other influence they may exercise on the general health of the body.

In the preceding chapter, we have shown that the waters contain large quantities of alkalies, salines, and carbonic acid gas. To these ingredients must be ascribed no inconsiderable share in the effects produced by the waters, whether

* "Dissertation sur les Eaux de Vichy;" 1755.

employed internally or externally. Thus, in a Vichy bath we cannot overlook the softening effect on the skin, which is no doubt due to the solvent action of the alkalies. But there is also a stimulation of the cutaneous surface, which occasionally, after a number of prolonged baths, may amount to irritation, and may, on delicate skins, even bring out a rash. This is due to the local action of the mineral constituents. These, when brought into contact with more sensitive tissues, set up severe pain. Consequently, when the skin is broken, bathing has to be suspended until the wound is healed. The solid ingredients and the gas no doubt reinforce the action of heat, but it is to this last agent that most of the effects of thermal baths must be ascribed. Considering the important part played by the skin in regulating the bodily temperature, the change of medium from air to water must powerfully affect the production of animal heat. Radiation and evaporation are interrupted, and the whole surface is protected from sudden variations. There is, consequently, less demand on the heat-producing function; but, at the same time, there is more rapid tissue metamorphosis, and greater functional activity, in consequence of the increased circulation established all over the surface, and which no doubt penetrates as deeply as the physical influence of the heat—a point varying with the intensity and duration of the application. It will be observed that these effects are obtained without shock, and without any extra demand on the vital

energy. A little more heat would powerfully excite the circulatory and nervous systems, but, at the temperatures usually employed at Vichy, although the baths at first produce some stimulation, the effect seems to be soon counterbalanced by the withdrawal of the blood to the surface, so that, though the cutaneous circulation remains more active for a considerable time after the bath, the pulse seldom varies many beats, and is quite as often a little slower as the reverse. Moreover, there is no depression after the Vichy baths. This probably depends chiefly on their temperature; for, as water may be made to convey heat either to or from the body, so there is a neutral point at which it is doing neither, and, though this point may vary somewhat in different persons, it is well within the range prescribed at Vichy. It is, too, known that baths containing salts and carbonic acid can be taken cooler and for a longer time than others, the sensation of cold, after the first impression, being less perceived.

It must not be assumed that the solid matter contained in the water can be absorbed into the system through the skin. It is true that numerous experiments have been made with a view of showing that various substances can thus find their way into the circulation, but they almost all negative the idea. Nevertheless, some writers still hold to the popular notion. In combating this view, we could not admit observations made at Vichy, because not only would every patient, although interdicted, be likely to sip occasionally

from one of the springs and so vitiate the result, but the whole of the drinking water of the neighbourhood is impregnated, to some extent, with soda. Further, not only is there no foundation for crediting the absorption of solids, but it is even improbable that the cutaneous surface can take up pure water. The sooner, then, we discard an untenable theory the better. Some of the most careful weighing experiments give a diminution in the weight of the body after a bath, but it is a matter of drams—or, at most, ounces—not pounds: quite within the variation due to pulmonary exhalation. It is easy to talk of millions of open pores as ready entrances for fluids; but, if this were so, what would be the consequence of bathing in poisonous liquids, or even applying poisonous lotions?

We may now notice the effects of drinking the water. As soon as it is swallowed, its chemical affinities are brought into play. Any acidity in the contents of the stomach must be immediately diminished, and an alkaline condition may be temporarily established. So, if it pass beyond the pylorus, the water will intensify alkalinity, or neutralise acidity, as it encounters one state or the other. Thus, the first effect is the chemical reaction on the contents of the alimentary canal; but we must not forget that the warm alkaline fluid may also act directly on the mucous surface as well as on its secretion. We know, further, that pure warm water taken into the stomach is not without effect on that organ and on the system.

As soon as absorption takes place, the natural alkalinity of the blood must be intensified by the bicarbonate of soda, which is the chief ingredient of the water, and a normal constituent of the blood. This base seems to facilitate osmosis, and promote oxidation of waste material. By it certain carbohydrates, organic acids, and even some constituents of the blood seem to be oxidised. As there is continual interchange between the blood and the tissues, we perceive how these, in their turn, undergo more rapid matamorphoses. Though we cannot watch the processes going on in the inner arcana of the economy, we can trace their results in the excretions, by which the disintegrated material is removed. As there is also a rapid elimination of the mineral salts, they, in turn, act directly on the organs by which they are removed, and notably alter their secretions. The skin and kidneys are most remarkably affected. The perspiration is rapidly neutralised, and the normal acid state of the urine replaced by an alkaline or neutral condition. This is what is commonly understood by alkalinising the system. The increased rate of disintegration leads to more rapid formation of new tissue so long as fresh nutriment is supplied and can be taken up. But if the digestive organs be imperfect, or if there be any other impediment to the assimilation of new food, wasting will ensue.

The changes we have enumerated cannot be without effect on the nervous system, which, in its several parts, may also be more directly influenced,

for—as first demonstrated by Humboldt—the excitability of a nerve is exalted by contact with an alkaline fluid.

The effect on complex organs may be observed in alterations of function. The action on the liver and pancreas is twofold—directly on the secretion, indirectly on the organ through the circulation. The circulation itself, as indicated by the pulse, is generally quickened at first, but later it is as often retarded. On the temperature we have but few observations, and they indicate little change. Barthez found the waters reduce the pulse, but there are other observations leading to an opposite opinion. Perhaps the truth is that large quantities deteriorate the health, either by impairing digestion or by interfering with later nutritive processes, and that such injury may manifest itself either by provoking a febrile attack or by bringing about a more sluggish cachetic condition, according to the constitution of the individual, or other circumstances.

CHAPTER IX.

THERAPEUTICAL PROPERTIES OF THE WATERS.

THE transition from the chemical and physiological action of Vichy water to its medicinal uses is both easy and natural. These qualities are all in reality closely allied, the strictly medical being only such as we may deduce from the combination of the others, but we must corroborate or correct our deductions by observation. Without entering into all the theories that have been propounded, we may fairly set out with the assumption that Vichy water is a potent agency for good or ill. Unlike chemically indifferent spas, the waters of Vichy are highly mineralised; they are strongly alkaline, their alkali consisting for the most part of bicarbonate of soda. We may therefore conclude that, whenever this base is indicated, a "Vichy course" may be safely tried; but when it is contra-indicated, no rational physician would sanction the experiment. But a course of mineral water is altogether a different thing from the mere administration of a certain quantity of any drug. What, then, are we to understand by a "Vichy course"? It comprises the systematic use of the waters, both externally and internally, for a period of about three weeks, during which the diet and

regimen should also be carefully regulated, and in some cases other accessories employed. It may perhaps be well to consider separately, (*a*) the external, (*b*) the internal, and (*c*) the accessory treatment.

(*a*) External. Of course the baths are the most important part of the external treatment, but sometimes douches take their place. Usually a bath of an hour's duration is taken every day throughout the course, but sometimes it is necessary to omit the bath now and again. In other cases it is desirable to prolong the treatment, taking the bath only every other day. Many visitors to spas cherish the superstition that a fixed number of baths must be taken by every patient. No enlightened medical man will countenance such an absurdity. Not only may the number of baths be diminished; it may equally be increased. Moreover, although an hour is the average time of each bath, the physician often has good reason for varying it in either direction. The temperature of the bath generally prescribed is between 88° and 94° Fahr. Even this is not an absolutely fixed quantity, but experience has shown that between these points the baths exercise the best influence. The water used for the baths is a mixture of the different springs, diluted at the time of using with an equal quantity of fresh water. A bath of pure mineral water is never given except by medical order, the reason being that the undiluted mineral water is too exciting, and the physicians of Vichy have informed me that they scarcely ever prescribe

them. I have tried their effect, but only one at a time. A series of such baths will, it is said, produce feverishness, headache, sleeplessness, nervous derangement, and even congestion of the brain. Sometimes it is found desirable to dilute the water more than one-half; in other cases, bran or starch is added to the ordinary bath. Though it is common to hear the remark that the duration and the composition of the baths are the chief points, I cannot but regard their temperature as equally or even more important.

(*b*) The internal treatment consists in drinking at one of the springs. This has to be selected with due regard to the patient's condition, for the action of the several waters on the system differs more than their chemical composition might lead us to infer. Perhaps the most important difference may be due to the temperature, in which we have seen there are great variations, some springs being hot, others quite cold. The presence or absence of certain ingredients, such as iron, may explain the prestige of some springs for particular ailments. The dose of the water should also be prescribed by the physician. It is dangerous for the patient to increase the quantity as recklessly as is done at some indifferent spas. It is not now common to exceed three or four small glasses, seven ounces each, though far larger quantities used to be regularly given. Much less is often enough to maintain the secretions neutral or alkaline, and this is sufficient for all purposes. If intolerance or disgust for the remedy sets in, it should be dis-

continued. The time for taking it is morning and afternoon—some time before breakfast and before dinner—that is, when the stomach is empty.

(*c*) Of accessory treatment diet is most important. At Vichy the French system of two meals daily is followed. This is convenient for bathing, and leaves suitable hours for drinking. Bordeaux wine or something as "light" is often recommended. It used to be held that all sub-acid fruits, vinegar, and wine should be denied, as they were supposed to neutralise the alkaline waters. It might have been supposed that in such case an extra dose of the waters would have sufficed to restore the balance. We now know that the acids of most of the fruits and vegetables found on our tables are oxidised in the system, and are excreted as alkaline carbonates, so that they would reinforce the effect of the waters rather than otherwise. As to the wine, it is not the acidity, but the alcohol it contains which is likely to be injurious. Certainly, all forms of alcohol are inconsistent with alkaline medication.

It is not necessary to dwell on the share which recreation, exercise, and climate may have in the treatment pursued at the numerous spas to which we sometimes send our patients. From the time when Abernethy sent an invalid on a fruitless errand to the North of Scotland, these circumstances have been fairly appreciated, and to them is probably to a large extent due the fact that a resort to the springs in most cases is more beneficial than the use of the exported waters. But, on

the other hand, there are no doubt plenty of people to whom the Vichy cure would be equally or even more suitable at home; there are thousands who could not possibly leave home without a complete break up of their families and business, while many would be better under the immediate directions of their own medical attendants than that of the most able practitioners who were strangers to their constitutional peculiarities. For all these the pure water bottled at the springs, and the salts for making the baths, are now to be had at a moderate price in London.

From what has been said, it will be seen that a Vichy course is likely to exercise a powerful therapeutical influence. Even the baths alone produce decided general effects, for, although we reject the notion of cutaneous absorption, we cannot refuse to credit the effects of the thermal treatment at Vichy or any other spa. An ordinary warm or hot bath may produce powerful effects both in health and disease. It is frequently prescribed as a diaphoretic and stimulant, or as a sedative, and sometimes as both at once. The sedative effect mostly follows the perspiration, and is intense in proportion to the time spent in the bath; while the exciting quality can be increased by raising the temperature. A brief immersion in a very hot bath stimulates the cutaneous nerves, and, through them, the cerebral and spinal centres. A prolonged use of a warm, but not hot, bath exercises a sedative influence over muscular spasm, convulsions, and pain; even soothes irritability of

mind or of the nervous centres, calms the heart's action, and conduces to sleep. A number of prolonged warm baths might induce a state of languor and debility. Wherein, then, do the baths at Vichy differ? The physicians of the place generally ascribe a stimulant, tonic effect to a course of mineral baths, and assert that the tonicity imparted by this treatment is particularly durable. That the course does not debilitate may be seen in the gaiety of those undergoing treatment, and by the energy with which they enter into all the amusements of the place. To what, then, must we ascribe the restorative action of the baths—to the saline ingredients? to the carbonic acid? to the temperature? or, finally, to the combination of all these agents? We have already seen that the salts and the gas exercise an influence in this direction. It is only natural to attribute to the heat those effects which may be obtained from indifferent thermal baths. The alkaline ingredients are of special value, but, when their full effect on the system is required, the waters must be taken internally. I think too much stress has been laid on the debilitating effects of fresh-water baths. Those who complain most of their baths weakening them, persist in taking them too warm. At a suitable temperature a series of prolonged baths may be taken with comfort, as we see at various thermal spas, but there comes a time when they have to be suspended; and even at Vichy Barthez found that some robust men, after three or four weeks of experimental

bathing, complained of a feeling of lassitude and depression. Probably, however, this would have passed off on reducing the temperature or duration of the baths.

The medicinal value of the internal use of the water corresponds with its chemical and physiological properties. In the *primæ viæ* it is an efficient antacid, and abundant experience proves that the warm alkaline fluid acts as a sedative on the gastric mucous membrane. In the circulation it maintains the alkalinity of the fluids, hastens osmosis, promotes oxidation, and facilitates the removal of waste products. These increased metamorphoses, so far as they are carried on at the expense of the tissues, lead to loss of weight. Fat is the first to be removed, and its disappearance is often so remarkable that some have supposed that it is soponified by the carbonate of soda and then carried away. But loss of weight is by no means a necessity. If nutriment can be easily assimilated and is abundantly supplied, new material may take the place of old, or its oxidation may shield the tissues and greatly aid respiration and calorification. This will enable the body to recuperate and even to add to its weight, justifying the term reconstituant which is often applied to the treatment.

Such is the explanation I would offer of the apparent paradox that a Vichy course may, according to circumstances, either increase or reduce the weight of the body. Nor must we forget that in unsuitable cases the treatment may impair

digestion and hinder nutrition at the very time it is promoting disintegration. If, then, it should be recklessly persisted in, rapid emaciation and cachexia would be a natural result. It is true that immense quantities have been taken with impunity, but some experimenters have had cause to regret their imprudence. This is not the use, but the abuse, of alkalies, and will receive no countenance from judicious physicians.

M. Mialhe, indeed, looks upon the bicarbonate of soda as an aliment, and maintains that it is inoffensive in far larger doses than are ever given, and that any great excess escapes by the bowels. According to him, there is a limit to the extent to which the system may be alkalinised, but he of course admits that this may be done sufficiently for therapeutical purposes. We know that we may neutralise, or even alkalinise, those secretions which are naturally acid, and we may keep them neutral for a considerable period—much longer than might have been conjectured—not only without danger, but with great benefit to certain patients. Others, however, ought never to be subjected to such treatment, unless under special conditions and for particular purposes. During elimination the kidneys are directly stimulated by the mineral matter, and their altered secretion acts topically on the whole surface over which it flows. Small doses soothe the mucous membrane, probably by reducing acidity, but large quantities may produce an opposite effect, and are likely to involve complications. The relation of the alkali

to the several forms of gravel is as obvious as it is important.

We may, then, sum up the effects of a Vichy course, when judiciously prescribed, as restorative to the digestive and assimilative functions, and invigorative to the general health. The tone of the stomach is soon improved, digestion becomes easier and more rapid, pain and weight after food disappearing. The bile flows more freely. The bowels become regular. Diarrhœa, if previously present, ceases. The consequence of these changes is better assimilation, and, therefore, flesh is often gained. With the improvement in nutrition, the colour returns to the cheeks and energy to the mind.

The skin becomes delicate and glossy, perhaps partly from the local action of the alkali on the epidermis. Sometimes an exanthematous-looking rash comes out. As to the special effect on the muscular system, there is some difference of opinion amongst authorities, which may perhaps arise from the varying duration of the baths on different individuals.

On the circulation there is no need to fear any considerable effect, either stimulant or depressant.

The nervous system may be excited, or, on the other hand, drowsiness and constant tendency to sleep may exhibit its sedative influence. In some cases it is said to greatly increase animal spirits. I have already alluded to the statement that an intoxicating quality has been conjectured by some to dwell in the water. It has been argued that

this is due to the carbonic acid it contains—the same gas, we are gravely reminded, which causes the effervescence of champagne. The nerves seem to be stimulated to greater activity by the presence of alkalies in moderate quantity.

Under the Vichy treatment, the gastric, biliary, cutaneous, and urinary secretions are augmented. What has been called a depurative influence is thus exercised on the blood, and, through this medium, on the solids. A more rapid removal of worn-out matter from the body, while a new supply can be assimilated, is undoubtedly an effectual method of restoring the health; and perhaps the increase of digestive and assimilative power, and the more rapid secretion which results from this treatment, are sufficient to explain its value.

Lastly, on the female reproductive organs a Vichy course is said to act in a special manner, and learned writers have gone as far as to attribute to it an influence extending over a protracted period, in some instances being so carried away as to ascribe to the mineral treatment an increase which has taken place in the families of patients months and even years afterwards. *Credat Judæus!* Could it act in any other way than as the general restorative described above? and there is nothing special in that.

In unsuitable cases the treatment may give rise to a number of unpleasant symptoms—mostly those of some special irritation—such as may be readily deduced from the foregoing particulars.

Even when most indicated, it ought to be com-

menced with caution—the tolerance of the system being gradually ascertained—and in all cases moderation ought strictly to be enjoined, much injury having arisen from the excesses that have sometimes been practised.

CHAPTER X.

SPECIAL THERAPEUTICS.

THE several properties of Vichy water having been already described, it is unnecessary to enter at length into the theories of those diseases in which it is chiefly recommended. From the general indications which have preceded, the English medical profession will have no difficulty in deducing the particular applications. Nevertheless, some brief observations on the more common uses of the remedy in question may serve as an epitome of the subject, and an index to the points most worthy of consideration. First of all, it may be observed that an alkaline thermal treatment is of most value in chronic cases. Next, that the diseases in which its effects are most marked are those implicating the organs of the abdominal cavity. From these propositions we may deduce that a certain degree of chronicity or obstinacy in the disease need not necessarily discourage a trial of this mode of treatment. Lastly, the Vichy cure may be attempted in all cases in which alkalies are chemically indicated. In the two former cases a complete course of thermal treatment is to be carried out; in the last, the indications can often be fulfilled by drinking at the springs, or even by

the use of the exported water. Bearing in mind the chemical qualities of Vichy water, the physician will find numerous cases in his daily practice in which he may prove its value. It may safely and conveniently take the place of many of the common alkaline formulæ, especially those containing soda, and it will be found more certain in composition, and therefore in its effects, than ordinary soda-water—an article which too frequently contains none of the alkali from which it takes its name. But, passing over these slighter cases, it may be well to summarise in a few paragraphs some of its more important uses.

Diseases of the Stomach and Bowels.

That, by its mere chemical reaction, Vichy water should appease the pains dependent on an excess of acid in the *primæ viæ* is at once evident, and that thus such forms of INDIGESTION should be cured is equally easy of comprehension. On the other hand, this remedy has been found efficacious where the action called into play by its continual use seemed rather to have been the immediate cause of the cure. From some valuable statistics scattered through the useful work of Dr. Barthez,* whose position as senior physician to the Military Hospital at Vichy afforded him a field for observation by which he greatly profited, it appears that, out of 100 cases of GASTRITIS, 51 were cured, 36

* "Guide pratique des Malades aux Eaux de Vichy;" Paris, 1861.

relieved, while only 13 were unbenefited. In PYROSIS 80 per cent. of the patients were cured. In GASTRALGIA 52 cases out of 100 were cured, 43 relieved, and only 5 continued in the same condition; while other forms of DYSPEPSIA were more tractable than even PYROSIS. In fact, Vichy is regarded by many as the natural cure for disorders of the digestive apparatus, and so about two-thirds of the visitors are sent there for such maladies. It must, however, be observed that, to obtain the best results in dyspepsia, no little discrimination is required in the selection of suitable cases. Thus, valuable as Vichy is in some cases of gastralgia, it is useless in others, and so as regards other forms of indigestion. Simple or idiopathic cases are very amenable to the treatment, but those which are rather of the nature of neuralgia are likely to be aggravated. Thus, again, maladies of the stomach are often complications of other diseases, and, unless these latter are likely to be benefited by thermal treatment, the patients should not be sent to Vichy to combat the accompanying dyspepsia. Cases of cancer of the stomach are met with at Vichy, but I do not see that the relief of symptoms at an early stage would be greater than could be obtained at home from ordinary treatment, and it is to be hoped no one would send advanced cases away. Diseases of the intestines are sometimes treated at Vichy, but there are none more difficult to manage. Some cases of *diarrhœa*, which may be looked upon as a kind of *intestinal* indigestion, do remarkably well,

but the treatment should be cautiously undertaken and carefully supervised. Favourable results have followed the waters in chronic tropical dysentery and diarrhœa.

Diseases of the Liver.

Closely allied to the previous ailments are a number of liver complaints, in which the reputation of Vichy has long been established, and the number of patients with this organ more or less involved to be met around the Grande Grille has already been alluded to. Vichy is, in fact, the spa to which those resort who have served in Algeria and other hot countries, and who suffer from the effects of tropical climates on the liver; besides which, other diseases of the same viscus are here successfully combated. Instead of entering on the several theories on the strength of which alkaline treatment is recommended in these cases, I shall take it for granted that they are sufficiently familiar to the reader, and merely stop to quote the statistics of Dr. Barthez on this point. Out of 100 cases of what he calls hepatalgia, or hepatic colic, 83 were cured and 17 relieved. In simple engorgement of the liver, with or without colic, 45 were cured, 40 relieved, and 15 received no benefit. This observer adds that the treatment would have been still more beneficial had not some of the patients suffered from the injurious drugs administered before their resort to Vichy. Out of 100 cases of biliary calculi treated by the same author, 60 were cured, 21 relieved, and 19 under-

went no change. JAUNDICE, which may be looked upon rather as a symptom than a disease, very often readily yields to the thermal treatment at Vichy; while that condition sometimes denominated sluggishness of the liver, as well as those forms of constipation or diarrhœa dependent on irregular secretion of the bile, are equally relieved or removed. In the treatment of all these diseases, drinking at the Grande Grille is usually prescribed in conjunction with the baths.

Diseases of the Spleen.

Engorgement of the spleen is as commonly treated at Vichy as that of the liver. Numerous subjects of this disease, contracted from residence in Africa, as well as those who have lived in marshy districts, every year find relief at this spa. It is asserted that great enlargement of the spleen following intermittent fever is speedily reduced by the conjoint use of the baths and drinking one of the springs, and, moreover, that, with the diminution of the diseased organ, the general state of the patient is also improved. From the experience of the Military Hospital, this disease would appear less amenable to the treatment than the same condition of the liver. Out of 100 cases of enlargement of the spleen originated by ague, the proportion was 37 cured and 45 relieved, while 18 continued in the same state as before treatment.

It will not be out of place here to mention that peculiar *cachexia* so often engendered by marshy

miasms. The pallid or sallow anæmic look of the patient, dependent on some profound alteration in the nutritive functions, and accompanied by a vitiated state of all the secretions, and sometimes by passive hæmorrhages more or less severe, has been attributed to a changed state of the blood—a diminution of its plasticity, a decrease of the red globules, and increase of the white—to use a long word, LEUCOCYTHEMIA. This disease might be supposed incapable of benefit from alkalies, and many physicians would hesitate to try them. Dr. Barthez, indeed, admits that Vichy treatment would not be proper in such a state if arising from a congenital lymphatic temperament, but he declares it to be curative when this condition is brought about by bad climate, indigestion, insufficient nutriment, inflammation of the liver or spleen, disease of the ganglionic system, or ague. Whenever prescribed for these cases, the Chalybeate springs would naturally be selected, and their action might be assisted by ferruginous preparations and other appropriate tonics.

Diseases of the Urinary Organs.

The deposit of lithic acid and lithates may be immediately suspended by the introduction of the bicarbonate of soda into the system, so that we need not be surprised to learn that the Lithic Diathesis may undergo a change by a complete course of thermal alkaline treatment. Uric acid, the urates, and the cystic oxide are all very soluble in alkaline liquids. Vichy water is therefore a sort

of specific for GRAVEL, provided that it be composed of either of these substances. But let it never be forgotten that the phosphates and oxalates of the urine are immediately precipitated by alkalies. It therefore follows that Vichy water may be positively dangerous in the phosphatic diathesis. This, indeed, is denied by Dr. Daumas,* who professes to have found the treatment as efficacious in white as in red gravel, and attributes this success to the *vital* as distinguished from the *chemical* action of the remedy. The explanation is, however, not satisfactory in face of the fact that a pellicle of ammoniaco-phosphate of magnesia may be seen on the surface of the urine as soon as it becomes neutralised or acquires the faintest alkaline reaction. In the deposit of lithates, Vichy water is a natural remedy, and, according to the statistics of Dr. Barthez, cured 55 per cent. of the patients and relieved 40 per cent. more, only leaving 5 per cent. unimproved. From the intimate relations between the skin and kidneys it is only natural to find that the thermal baths are of great value in lithiasis ; but they are usually supplemented by drinking the waters. Patients suffering from these disorders, who cannot go to Vichy, may also advantageously employ the imported waters.

CALCULI.—It is not surprising that numerous differences of opinion should surround the question as to the capability of this treatment dissolving

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* "Etude biographique et médicale des Sources de Vichy ; " Paris, 1860.

renal or vesical calculi. In 1839 M. Bérard* reported that this was not only possible, but offered great probabilities; and, further, that a trial could not be attended with danger. M. Ossian Henry afterwards gave favourable opinions from a number of experiments with the liquid on certain calculi; but these experiments in the laboratory are by no means conclusive as to the possibility of acting on the human body, and, although one or two writers still think small stones may be dissolved, they do not pretend that large ones can, while most authorities do not admit that any calculus once formed can be thus removed. Where the symptoms have disappeared, the stone has probably found its way out *per vias naturales.* The immense preponderance of uric calculi over phosphatic is perhaps the most hopeful fact in the history of this painful disease in relation to the long-vexed question of removal by solution. But this also points to other alkalies as preferable to soda.

VESICAL CATARRH.—After all the ordinary remedies have failed, good results have sometimes been brought about in this disease by a complete course of Vichy treatment. Of 97 cases admitted into the Military Hospital, 35 are reported as cured and 51 relieved, no difference being perceptible in the remaining 11. Bathing as well as drinking is employed in this disease; enemas also have been found useful, and injections have been tried.

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* "Bulletin de l'Académie."

This last local application deserves a further trial. Cases complicated with calculus, paralysis of the bladder, and incontinence of urine have also obtained relief.

Gout.

Whether we believe that uric acid in the blood excites the paroxysms, or that this statement ought rather to be reversed, we may start from the decision of the Paris Academy as to the value of Vichy water in gout. After animated debate, this learned body agreed that it had been "*useful rather than noxious.*" Next, let us take up the statistics of the Military Hospital, so often cited. In 57 patients out of 100 admitted under Dr. Barthez, the paroxysms entirely disappeared, although they had previously recurred for several successive years—once or more a year; 34 were so much relieved that some of them considered themselves quite cured; 9 were neither better nor worse. This physician declares that in all his experience he never saw gout recede to the internal organs, nor the blood suffer injury, from the treatment, although many patients had carried it to excess. The error of abusing the remedy has been previously noticed. It is again referred to because it has been in gout that the alkalinisation has often been pushed beyond the limits of prudence. A good remedy in moderate doses may in unlimited quantities prove a poison, and such alkalies might easily be to gouty persons

unless employed with proper precaution and, as a rule, short of alkalinising the system. The spring of the Célestins has the greatest reputation for gout. Perhaps, being cold and of more pleasant taste, it more easily pleases the fastidious palate. There is certainly nothing in the chemical constituents to render it so much superior to its fellows, the ingredients in all being so nearly alike. It has appeared to me that one reason for its proving so valuable in these cases is its position. Located half a mile or more from the establishment, to drink at this fountain two or three times a day means to walk a certain distance, and we all know what a valuable adjuvant to the treatment a certain amount of walking exercise must be; especially would this walk prove superior to the dreary marching up and down the gallery for so many minutes, which is not seldom prescribed. Arrived, too, at the fountain, and the draught taken, the patient can continue his stroll in this picturesque garden, or repose, before his return, in the pavilion fitted up for his use. The baths are less employed in gout than in other ailments, and, the spring being cold, the treatment might be carried out in England with the bottled waters could we prevail on the patient to submit to the other hygienic conditions.

Rheumatism.

In this disease Vichy has never been so popular as in gout. It may be thought that this is because the excess of acid in the secretions is most mani-

fest in acute rheumatism, when patients cannot be moved. But in more chronic rheumatic affections alkalies are often employed, though, it must be confessed, with little success, unless for the purpose of meeting temporary indications. This may perhaps be regarded as another indication of the inadequacy of the chemical theory of rheumatism. Of late years the frequent association of joint affections with nerve lesions has been amply illustrated by Charcot, Weir-Mitchell, and others; but, long before their investigations, the late Dr. Billing taught at the London Hospital and in his "Principles of Medicine" that all forms of rheumatism were of neurotic origin, and could only be satisfactorily treated in accordance with this view.

It will, then, be well to restrict the internal use of Vichy water in rheumatism to those cases in which alkalies are indicated to rectify disorders of digestion and assimilation. On the other hand, the baths may be employed to alleviate pain and promote the restoration of movement in joints. In sciatica, in lumbago, and all forms of muscular rheumatism, any warm baths are serviceable. When they can be taken, warm swimming-baths are often effectual. But douches are frequently the most efficacious; and these are also beneficial in rheumatic gout, provided they are carefully administered and are warm enough. They are often very powerfully aided by vapour baths, either local or general. It will be observed that it is the thermal rather than the alkaline treatment which is the essential point in rheumatism, and this is

why all thermal spas can boast of more or less success in the management of that disease.

Diabetes.

This intractable disease has been submitted to the Vichy treatment, with results that have encouraged many observers. In 100 cases treated by Barthez, 50 lost all traces of sugar, in 16 it greatly diminished, while in 34 it remained the same in quantity as before, and that in spite of improved digestion and increased muscular strength following the treatment. From his observations this author concludes that, if the patient on arriving at Vichy only secrete a small quantity of sugar, it may disappear under the thermal treatment, but that if the quantity be large this result will not be readily attained. He further remarks that, as this manifestation is likely to recur, the patient should go to Vichy several successive years. Dr. Daumas seems to entertain a less favourable view; while Dr. Durand-Fardel, who has made a profound study of the subject, concludes, very rationally, that, without looking on the treatment as a chemical specific, since equally good effects may follow other methods, none approaches that of Vichy for the certainty and regularity of its results in the majority of cases.

Albuminuria.

Some of the Vichy physicians have thought that the elimination of albumen by the urine might be

held in check by their treatment. It is quite conceivable that the stimulation of the skin by hot mineral baths, conjoined with hot alkaline drinks, together with tonics, might in some cases be useful. But this is little more than making the hot mineral baths a valuable adjuvant to other treatment. Especially would such practice be likely to succeed where the albuminuria manifested itself as the sequel to some eruptive fever. In Bright's disease much circumspection would be required in allowing the alkali to be taken into the stomach; whenever the results of desquamation are to be found in the urine, the utmost caution should be exercised. Possibly, in minute doses, the alkali might sometimes be of service, though I should be more inclined to confine the thermal treatment of this disease to the baths, looking upon these only as an adjunct to the ordinary means employed. Moreover, vapour or hot-air baths, if only they were carefully used, would seem preferable to the mineral baths.

Diseases of the Heart.

Cardiac disease is usually looked upon as precluding a resort to mineral waters, and Vichy among the rest. Nevertheless, some French authorities have proposed their employment, and MM. Vernière and Dufresse de Chassaigne have reported to the Academy favourable results from a trial of the Chalybeate waters of Saint-Nectaire and Chaudes-Aigues. Dr. Nicolas has also main-

tained * that the mineral treatment of Vichy may be advantageously resorted to in certain organic diseases of the heart, and most especially in those arising in the rheumatic and gouty temperaments. His theory is not inferior to many others proposed on the mode of action of this remedy—indeed, it consists in a combination of the chemical and vital theories propounded by others, and is an exemplification of the extent to which we may go when once we look upon the human body as a mere laboratory. The ingenious author will find it difficult to convince the English mind that the mineral water finds its way to a valvular concretion, and then breaks it up and dissolves it. Besides which, although it may be yet found that the treatment is less dangerous than has been believed in heart disease, it will always demand the utmost precaution in prescribing it.

Diseases of Females.

That a number of the patients may be benefited by the various healthful influences by which they are surrounded at most spas is incontrovertible, and that certain mineral waters are particularly efficacious requires no testimony. At Vichy, it is by the Chalybeate springs that this class of maladies is treated, nor need we care to deny that the small, yet perceptible, quantity of iron in the Mesdames or the Lardy may be of peculiar value in ANÆMIA. But, while admitting this, we are not

* "L'Utilité des Alcalins et surtout des Eaux minérales de Vichy ontre certains Affections organiques du Cœur."

to overlook the importance of other hygienic measures, and the general improvement of the health which follows a course of the baths is perhaps the first step in the cure. At the same time, where iron is deficient in the blood, it is not to be doubted that the system is capable of separating it from a liquid in which a minute quantity of that metal exists quite as easily, and, for aught we know, more easily, than from our medicinal preparations.

In CHLOROSIS, M. Petit * looks upon the efficacy of Vichy treatment as equalled only in few other diseases. This seems, after what has preceded, almost an exaggeration, yet all the other local practitioners regard the ferruginous Vichy springs as peculiarly serviceable in this ailment, and several maintain that the Mesdames and the Lardy are sufficient for the cure of all cases. The first good effect is almost invariably produced on the digestive system, and how often, when the general health improves under any kind of treatment, the special organs return to the discharge of their functions is well known to every observer. In the merely sympathetic cardiac symptoms which often accompany these cases there can be no contra-indication to the treatment.

CONGESTON OF THE UTERUS, as well as some degree of HYPERTROPHY, and all that terrible train of symptoms resulting from inflammation, irritation, or even natural stimulation of this organ,

* "Du Mode d'Action des Eaux minérales de Vichy;" Paris, 1840.

may be appropriately submitted to thermal treatment, and every year numerous sufferers find at Vichy some relief from the consequences of difficult or too frequent labours, painful miscarriages, irregularities of menstruation, falls or other accidental injuries, as well as natural and preventible sources of irritation. LEUCORRHŒA should be looked upon as a symptom only, and its management referred to its cause.

OVARIAN disease or mere irritation may have a similar origin, and give rise to the same train of distressing symptoms. Happily, it is also frequently amenable to the same treatment. It is in these cases that *piscines* are mostly used. These baths are large enough for several patients to take together—a sort of swimming-bath, in fact. Their chief recommendation is that the patients can move freely about during the time of the bath, and therefore may stay in it a longer time without being overwhelmed by the tediousness. It has been urged, also, that they can talk together, but I am not one of those who deem this an advantage, for conversation would naturally turn on the one subject of the patients' maladies, and the less attention they give to their local symptoms the better. Nor can I altogether reconcile this with the peculiar delicacy which should be the charm of the female mind. The less fuss made about the uterine or ovarian lesions the better.

It is in these diseases that enemas of Vichy water are found of the greatest service, and in-

jections may *in some cases* be safely employed, though only with considerable circumspection. It is from the use of the warm baths that I should be disposed to anticipate most advantage. Acidity in the *primæ viæ,* so often present, could be appropriately relieved by drinking at one of the springs. Douches and frictions will suggest themselves as likely to benefit many sufferers, and exercise—walking or driving, according to circumstances—as well as every other means of restoring the health, including sometimes the administration of some drugs, will prove valuable adjuncts to the treatment.

In malignant diseases it has been found by some that the baths have moderated the sufferings of the patients, and afforded a temporary tonic to the system; but probably warm mineral baths at home would be equally good, and of a hundredfold more comfort to the unhappy sufferer. There could be no harm in trying them made with the Vichy salts, now to be had in England, the extraction of which has been previously described.

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