Practical observations on cold and warm bathing; and descriptive notices of watering places in Britain / [James Millar].

PRACTICAL OBSERVATIONS

ON

COLD AND WARM BATHING;

AND

DESCRIPTIVE NOTICES OF WATERING PLACES IN BRITAIN.

By JAMES MILLAR, M.D.

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This is the purest exercise of health,

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Even from the body's purity, the mind
Receives a secret sympathetic aid.

THOMSON.

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PREFACE.

THE very general practice of bathing furnishes ample proof that it must be followed with some advantage. For although fashion and example, by their powerful influence, might at first introduce and give it currency, yet they could not insure its continuance and increase. But however useful the practice, those who have directed their attention to it, cannot fail to have observed that its beneficial effects have been often greatly limited, and, in some cases, directly counteracted, by improper or injudicious management.

In the following Treatise, it has been the object of the Author to bring within a narrow compass the most useful rules and directions for regulating the practice of cold and warm bathing; and, keeping this object in view, he hopes he has succeeded in compressing all the material information on the subject, that is detailed in larger volumes, or scattered in different works.

On some points the Author has ventured to express a very different opinion from what is entertained by writers on bathing; but he is confident that he has asserted nothing that experience and observation will not fully confirm.

The Descriptive Notices of Watering Places throughout the kingdom, although they are necessarily very

brief, may enable those who have the means in their power, to make a proper selection, by considering the season of the year, the general character of the place, and the nature of the mineral water.

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PRACTICAL OBSERVATIONS

ON

COLD AND WARM BATHING.

INTRODUCTION.

THE practice of bathing, as a remedy in disease, or as a luxury, seems to have prevailed in all ages. Among ruder nations, and in the warmer regions of the earth, the cold bath has been more generally employed; but in more temperate climates, and in the progress of refinement and luxury, a feeble and enervated people, having experienced its grateful and invigorating effects, indulge more freely in warm bathing. Thus it appears, that in later times, the use of the warm bath became a principal gratification among the Greeks and Romans;

and hence it is, that the magnificent ruins, which have resisted the waste of ages, and which mark the grandeur and extent of the establishments which were erected among the latter people, chiefly by rulers who sought popular applause, afford a striking testimony how much this luxury prevailed in the degenerate times of the Republic.

Bathing, with a view probably to its detersive effects, or as it contributes, by promoting cleanliness, to the health of the body, has been recommended in some countries by legislators and founders of peculiar systems of faith, and has thus assumed something of the form of a religious ceremony; and hence its observance at stated times has obtained a place in the code of duties prescribed to some of the eastern nations.

The very general practice of bathing which prevails among all ranks of the inhabitants of this country, shows that the benefits which are derived from it are held in no small degree of estimation. The young and the old, the rich and the poor, the exhausted and the feeble, retire annually from the fatigues and business of the crowded ci-

ty, to seek new vigour and refreshment on the shores, and at the watering places of the kingdom. This practice, which every returning season sees on the increase, can scarcely be supposed, as has been sometimes alleged, to be merely an amusement, or affording only a variety of scene and a change of society: its more general prevalence and continuance are certain proofs of some real benefits which attend it, otherwise the tide of fashion would ere now have turned into some other channel, and the practice itself would have been long ago neglected and disused.

Bathing, then, from the practice having prevailed in all ages, and from its use being so generally resorted to in this kingdom, must assuredly be of extensive utility. It must therefore be an important investigation to ascertain what are the real benefits to be expected from the practice of bathing; and to know what rules should be observed to have the full advantage of these benefits. These topics are the objects of inquiry in the following observations, which may be conveniently divided into two parts; in the

first of which, cold and warm bathing will be treated of; and, in the second, a few historical notices of the principal watering-places of the kingdom will be introduced, pointing out the character of the situation, the nature of the mineral water, and some of the diseases in which it may be expected to prove beneficial.

PART I.

OF COLD AND WARM BATHING.

To point out the benefits to be derived from bathing, and to give such directions as seem best calculated to insure these benefits, it may be necessary to treat, first, of Cold Bathing, and, secondly, of Warm Bathing, in separate chapters.

CHAP. I.

OF COLD BATHING.

The external application of cold water to the body, or cold bathing, were it the purpose of this treatise to enter deeply into the investigation, might be considered in two points of view; either with regard to the detersive properties of the water, in re-

moving from the surface of the body the impurities from the secreted matters, which, if allowed to remain on the skin, might be prejudicial to its proper action, and to the health of the system; or with regard to the effects of cold from the temporary diminution of the heat of the body, uniformly exposed by immersion to a colder medium. It is not improbable that the utility of cold bathing may consist in producing both these beneficial effects. But the present observations are too limited to admit of the discrimination of these advantages being pursued.

Some estimate might be formed of the value of cold bathing in contributing to the health and comfort of the body, if it be considered how much these beneficial ends are attained by a partial application of cold water in bathing or washing the face, hands, or feet; and how greatly the whole frame is refreshed and invigorated even by this treatment of the extremities. The daily and universal practice of this partial system of bathing, is a sufficient proof of the benefits derived from it.

But, avoiding all minuteness of investi-

gation, and as much as possible every thing like physiological discussion, the remarks which follow will be limited to points of practical utility, and will be employed in laying down directions for the beneficial use of the cold bath. With this in view, what is briefly to be offered may be arranged under the four following heads: 1. The proper time for bathing; 2. The state of the body when bathing should be employed; 3. The mode of bathing; and, 4. The diseases in which bathing may be useful.

SECT. I.—*Time of using the Cold Bath.*

OF those who have recommended cold bathing, some propose that it should be employed early in the morning, while others are strenuous advocates for delaying it till after mid-day. It may be observed, in general, that the proper time for bathing must depend on many circumstances, all of which ought to be fully considered before any precise rule can be given on this point. In sea-bathing, in many cases, the time is unavoid-

ably in a great measure regulated by the state of the tide; but in other situations, and where the opportunity of artificial baths may be had, the time which shall be deemed most suitable may be easily determined.

In different states of the tide, experience has shewn that the temperature of sea-water considerably varies. When it is high water about two or three o'clock in the afternoon, it has been found that the temperature of the water is ten or twelve degrees higher than what is indicated by the thermometer at the time of low water, about eight o'clock in the morning of the same day.

The temperature of the sea admits only of variation in the time of calm weather. The agitation of the waters in a storm diminishes greatly the general temperature of the sea; for then the deeper water, which previously remained undisturbed, and at a distance from the influence of the sun, is mixed with that at the surface; and thus a uniformity of temperature is produced. But during the warm season of the year, and on a sandy beach, this variation of temperature

is quite perceptible; for it is found that sand not only absorbs, but also gives out heat with more facility than a gravelly or rocky bottom.

To the strong and healthy, it is of no great import to observe precautions with regard to the time of bathing, in the view of enjoying a few degrees higher temperature of the water; but it is otherwise with those who expect the vigour of an enfeebled constitution to be renewed by the use of the cold bath. To them, therefore, it must be a piece of essential information to be told, that the temperature of a flowing tide about mid-day, or within an hour or two afterwards, is not less than ten or twelve degrees higher than at an earlier hour in the morning.

Early bathing is recommended by some, on the supposition that the body being exposed to a cold medium, while the stomach is loaded with a full meal, disturbs and retards the process of digestion, which requires the heat of the body to be kept up to the same uniform degree. But although it seems improper, and perhaps in some cases might

be attended with hurtful consequences, to immerse the body, with a full stomach, in water far below its own temperature, this can never be urged in support of the practice of bathing immediately on leaving bed, or at an early hour in the morning. Persons of a feeble constitution, who bathe in the open sea, will do well to consider, not only the difference of temperature of the sea between the morning and mid-day, in the particular circumstances alluded to above, but also the difference of temperature of the air at these different periods, and thus regulate the time accordingly.

It may be observed, in general, that as the air and the water are lower in temperature in the morning than they are at noon, and as the body itself, from having had no exercise, and from the want of food, has not acquired the proper degree of heat, and may not be in that condition which will be afterwards pointed out, early bathing should be cautiously practised. This observation, however, is inapplicable to the use of the artificial cold bath at an early hour; for there the temperature both of the air

and water is nearly the same at all hours of the day.

Bathing in cold water, at an early hour in the morning, should be carefully avoided by those who have been previously subjected to severe fatigue, while the body is yet in an exhausted or debilitated state; and it should be equally avoided by those who have indulged in any excess or intemperance, and before these effects have gone off. If the cold bath is to be employed in such cases, mid-day, when the air and water have reached their highest temperature, will be the most proper time for using it. Here it may be added, that the practice of returning to bed, after bathing in the morning, is hurtful. This is not unusual with children: but profuse perspiration is the natural consequence; the debilitating effects of which, more than counteract the invigorating effects of the cold bath.

The use of the cold bath in the evening, when the body has been exposed to exertion during the day, and is exhausted by fatigue, especially by those who have been in the habit of living generously and full, will, in

general, be found to be prejudicial. If the healthy and the vigorous enjoy, after the cold bath in the evening, undisturbed repose during the night, the use of it may be continued; but if copious perspiration in the night shall be the consequence of evening bathing, the practice ought to be relinquished.

SECT. 2.—*Previous Condition of the Body proper for Cold Bathing.*

THE use of the cold bath has been in some cases followed with much benefit; while in similar, or in the same cases, and apparently in the same circumstances, it has at other times failed of producing any salutary effects; or rather, on the contrary, these effects have been injurious. One thing, by which this difference may be accounted for, has probably been overlooked. This is the previous state of the body with regard to temperature and exertion. If the body have been exposed to severe exercise, and if this be followed by lassitude, debility, and re-

duced temperature, immersion in cold water will most assuredly produce very different effects from what may be expected from it when the body is in the full vigour of health, and its natural heat is undiminished. It need scarcely be added, that the consequences of inattention to the previous condition of the body, will be still more hurtful in proportion to the debility and delicacy of the constitution. From all this, therefore, it follows, that the state of the body before the use of the cold bath, ought to be regarded as of the most essential importance; and the more so, as a practice in cold bathing, the very reverse of what is now to be recommended, and founded on erroneous opinions of the nature of the animal economy, is far from being uncommon.

Excepting by those whose professional pursuits require attention to the phenomena of animal life, or by those who are led by curiosity to study the same subject, it would scarcely be suspected that the variations of temperature of the human body, in the full vigour of health, and in the violence of fever; in the time of the most active ex-

ertions, or debilitated with fatigue and languor, are limited to a very few degrees. But although these extremes, as they are indicated by the thermometer, are not far distant, yet the sensations which prevail when the temperature of the body is raised to the one, or depressed to the other, are very different. Now, it is when the heat of the body is at its lowest temperature that cold bathing should be avoided; for when the body is in this state, whether it proceed from exposure to cold, from exertion and fatigue, or any other debilitating cause, its effects, instead of being salutary, will most certainly be injurious; nay, it has sometimes happened that this necessary and prudent precaution being neglected, the consequences have been fatal.

It may be adopted as a general rule, that the condition of the body proper for immersion in the cold bath, is that in which, after being for some time in a warm place, or after moderate exercise, the temperature is in the highest extreme. And, indeed, although the body be in some degree of perspiration, immediately previous to bathing, so far from

any danger being apprehended, this state of the body may be regarded as the fittest for enjoying the salutary effects expected from bathing. It is not, however, to be understood, that immersion in cold water is here recommended when the body is in a profuse sweat. In some cases, even in this state of the body, the good effects of the cold bath might follow; yet as such a practice is not altogether without hazard, it is safer to avoid it entirely, lest the debility and languor which usually succeed should be induced before immersion, and thus all the injurious consequences of exposing the body to cold in this enfeebled state should be produced.

"In the earlier stages of exercise," says Dr Currie, "before perspiration has dissipated the heat, and fatigue debilitated the living power, nothing is more safe, according to my experience, than the cold bath. This is so true, that I have for some years constantly directed infirm persons to use such a degree of exercise, before immersion, as may produce some increased action of the vascular system, with some increase of heat;

and thus secure a force of re-action, under the shock, which otherwise might not always take place. The popular opinion, that it is safest to go perfectly cool into the water, is founded on erroneous notions, and is sometimes productive of injurious consequences. Thus, persons heated, and beginning to sweat, often think it necessary to wait on the edge of the bath until they are perfectly cooled, and then, plunging into the water, feel a sudden chilliness that is alarming and dangerous. In such cases, the injury is generally imputed to going into the water too warm ; whereas, in truth, it arises from going in too cold.

" But though it be perfectly safe to go into the cold bath in the earlier stage of exercise, nothing is more dangerous than this practice after exercise has produced profuse sweating, and terminated in languor and fatigue ; because, as has been already repeated more than once, in such circumstances the heat is not only sinking rapidly, but the system parts more easily with the portion that remains."

In these judicious observations, the dis-

crimination of the two states of the body is properly and accurately made: in the one of which, when the temperature of the body is at the highest point, cold bathing will be useful and salutary; while in the other state, when the body is in some measure cooled down below its ordinary temperature, the same practice will infallibly prove hurtful.

The proper condition of the body for using the cold bath, may be easily ascertained by a simple experiment in partial bathing. Let any one, after the face and hands have been exposed for some time to cold air, bathe them in cold water, and observe the effects. Instead of the agreeable sensations and fine glow of heat which even this partial application of cold water usually produces, a chilliness and shrinking of the skin, as it were, succeed, diffuse themselves over the body, and continue even for a considerable time; unless, with the view of exciting the natural heat, recourse be had to artificial heat or violent exercise. This experiment may be varied by exposing one hand to cold, and keeping the other in a warmer medium, and

then bathing both hands in the same cold water for the same length of time: the hand whose temperature was reduced by the cold, will experience unpleasant and chilly sensations, while the sensations of the other will be warm and agreeable.

The popular opinion, that a sudden transition from a warm to a colder medium, when the body is heated, or even in a state of perspiration, is followed with dangerous consequences, is founded on incorrect observation and erroneous notions of the nature of the living powers. How rarely does it happen that any bad effects are produced by going into the open air at the temperature of freezing, or even some degrees below it, after being in an apartment heated to 60 degrees, or sometimes nearly to 70 degrees? Catching cold, as it is called, is indeed often ascribed to this cause, and is supposed to be the consequence of exposing the body to the sudden alternations of heat and cold. But it ought to be considered what has been the previous state of the body; and if this be attended to, it will be found that the cough, hoarseness, and feverish symptoms, which

come under the denomination of a *cold*, and are ascribed to exposure to cold, after being for some time in a warmer medium, are most frequently induced after profuse perspiration in the bustle and agitation of a crowded assembly, and when the body is exhausted by fatigue and enfeebled by languor.

The Roman youth, in the midst of the most violent exercises, plunged into the water, and swam sometimes oftener than once across the river; and all this with the most perfect impunity. But it is to be particularly remarked, that this immersion in cold water did not take place when the body was debilitated by exertion, and cooled by profuse and long continued perspiration; but while its vigour was little wasted, and the heat was above the natural temperature.

The peasants of Finland exhibit, in the use of the vapour bath, one of the most remarkable instances of the instantaneous transition from wide extremes of heat and cold; and so far from suffering any inconvenience or injury from this practice, it seems to be followed in some measure as an amusement. The vapour bath, which is employed

in that country, is heated to the temperature of 160 degrees Fahrenheit, and even sometimes higher. In this bath, and at this high temperature, the peasants often remain for half an hour, and sometimes for the space of a whole hour; during which, in the winter season, they frequently go out of the bath quite naked, and roll themselves in the snow, when the temperature of the external air is so far below the freezing point as to give a number of degrees equal to 180, or equal to the distance between the boiling and freezing points. They even come out from the bath, still naked, and converse together for some time in the open air, and sustain no injury whatever.

In one word, to have the full benefit of the cold bath, the proper condition of the body is when the heat is preternatural, whether this increase has been induced by exercise or otherwise; and even no danger need be apprehended by going into the water when a slight perspiration prevails. On the contrary, the diminished heat of the body, and particularly when it is exhausted by fatigue, and in a state of languor and debility, and,

in short, when the vital energy is reduced, ought to be regarded as necessary precautions to avoid cold bathing.

Sect. 3.—*Proper mode of using the Cold Bath.*

It might seem at first sight an useless discussion to enter into the consideration of the mode of bathing, where nothing more appears necessary than the immersion of the body. But if some of the circumstances connected with this immersion be overlooked or neglected, it will be found that the advantage expected from cold bathing will be greatly diminished; or, instead of being a salutary, it will prove, as it has often done, an injurious practice. If, for instance, much time is occupied in undressing or preparing for immersion, and if the bather remain too long in the water, bad effects will infallibly follow, and may lead to the supposition, that the use of the cold bath, being uncongenial to the constitution, must therefore be abandoned; and thus the

benefits to be derived from it under proper management are finally relinquished. To prevent such disappointment, and with the view of having all the advantage from cold bathing properly regulated, it is proposed, in the present section, to consider what should be done previous to bathing, the time of remaining in the water, and the future management.

It will be recollected, from the observations already adduced, that the great object in the practice of bathing is to preserve the temperature of the body undiminished. Any deviation from the rules and precautions which have this object in view, will undoubtedly be prejudicial, and ought therefore to be avoided. With this idea impressed on the mind, it will not be necessary to enter into any long detail in discussing the points above alluded to.

Having by previous moderate exercise, or otherwise, increased the temperature of the body, so that it feels warm and comfortable, and having reached the spot for bathing, the clothes should be stripped off as quickly as possible; and that no time may be lost, it

might be a proper precaution, where it can be conveniently observed, to have the dress of such a nature that it could be easily and expeditiously removed. To remain for any length of time in a state of half preparation, as it were, with part of the clothes laid aside, must, it is obvious, reduce the temperature of the body, and bring it to that state when bathing should be carefully avoided. If, even during the heat of summer, the body while half undressed is exposed to the open air, it will, in a much shorter time than is usually imagined, be so cooled, that bathing afterwards will not be attended with the salutary effects expected from it, and sometimes the consequences may be prejudicial. The last, it seems extremely probable, is not unfrequently the case, from inattention to the circumstance now under consideration. The moment, therefore, that undressing is finished, and this should be performed as expeditiously as possible, the body should be immersed in the water.

Many who have been little accustomed to the use of the cold bath will recollect, from their own experience, that the appre-

hension of the shock on first entering the water, or the feelings of repugnance to encounter it which begin to operate powerfully in preparing the body for bathing, occasion no small delay at this time. But such apprehensions and feelings are extremely hostile to the beneficial effects of the cold bath; and even, independent of the hesitation and delay thus induced, the strong aversion which is excited is not without its effect in frustrating the ends of cold bathing. It becomes necessary, then, by an exertion of the mind, to conquer and suppress such feelings, which, like other emotions, gain strength by indulgence, and become at last habitual and troublesome companions; and to keep the benefits of the practice full in view, seems to be the only successful way of obtaining this victory. These feelings seem to be alluded to by the poet—

Nor when cold winter keens the brightening flood,
Would I, weak, shivering, linger on the brink.

THOMSON.

Being prepared for going into the water, the proper length of time for remaining in

it is now to be considered; and with regard to this circumstance, the practice of bathing, as it is commonly conducted, is most erroneous and hurtful. This point may be easily and satisfactorily settled by experiment. Let any one take a single immersion in the cold bath, and let the time he remains in it not exceed a minute or two; let him then observe the effects which follow. Let the same person, at another time, when he wishes to use the cold bath, continue in it for eight or ten minutes, as is the usual practice; and during this time, let him alternately plunge into the water and expose the body to the air; he will now experience very different effects. The first case will be followed by an agreeable sensation of warmth, or a glow of heat over the body, which may be regarded as a sure test of the utility and benefit of cold bathing, as well as by an increase of muscular vigour and hilarity of spirits; but in the last case, chilliness and shrinking of the skin, diminished vigour of the muscular powers, general lassitude, and not unfrequently headache and depression of spirits, with a variety of unpleasant sensations,

which no exertion during the rest of the day can drive off, are the certain consequences of remaining too long in the water.

The good effects of cold bathing, it ought to be observed, depend on the sudden exposure of the body to a medium colder than itself, by which a certain quantity of heat is abstracted, and the consequent reaction, as it is called, or exertion of the animal functions, to restore to the body that degree of heat of which it has been deprived. Now these effects are directly counteracted by remaining too long in the water, and still more so by alternate immersion in the water, and exposure to the air. Every time that the body is placed in a medium colder than itself, it is necessarily robbed of a new portion of heat. But in the intervals of the immersion, when the body is exposed to the air of the atmosphere, another and a considerable portion of heat is carried off, in consequence of the evaporation of the water from the surface of the body; so that by this practice it is cooled down, as it were, or deprived of a greater portion of its heat than the vital functions can in a short time recover;

and hence the sensation of chillness and other disagreeable feelings which are thus induced.

These bad effects will be in some measure obviated by keeping the body immersed in the water during the whole time that the bathing is continued, so that no part of the heat shall be carried off by evaporation. These effects, too, are still farther obviated by the practice of swimming. Those who have acquired this art should never fail to practise it while they remain in the water; for beside the uninterrupted immersion of the body, the requisite muscular exertion in swimming tends greatly to keep up the balance of temperature, which is lost by placing the body in a medium so much colder than itself. But the safe and obvious rule is, to remain only a very short time in the water; at least those who have a delicate constitution, or who wish to insure all the salutary effects of cold bathing, will do well to observe it strictly. The length of time, indeed, may be in some degree regulated by the season of the year and the temperature of the water. When the season of the year

is mild and the water not cold, the period of immersion may, without much risk of danger, be protracted; but when the air is keen and sharp, and the temperature of the water is greatly reduced, the time of remaining in it ought to be very short.

Here it is proper to notice another singular error which has crept into the practice of bathing, and which has received countenance and support even from some medical writers. According to this erroneous opinion, it is said that the head should be immersed, as well as the rest of the body, immediately on going into the water; and the reason assigned for this practice is, that the accumulation of blood in the head, with all its direful consequences, which would take place by neglecting this precaution, may be prevented. Without entering into any physiological discussion on this point, which is far from the object of this treatise, it may be asserted, that no such repulsion to the head, or accumulation of blood, ever happens without exhibiting the terrible symtoms of a violent disease; so that in the view of warding off an attack of this disease,

no danger from the omission of wetting the head need at all be apprehended. On the contrary, it seems to be extremely probable that many of the bad effects which are ascribed to cold bathing, and which have forced many to abandon it, who were anxious to persevere in its use, derive their origin from this very practice, which common opinion has sanctioned and recommended. And, indeed, what hurtful consequences may not be expected from the impression of the water on such delicate and sensible organs as the eye and ear, while at the same time it enters the mouth and nose, threatening suffocation. Every person who plunges headlong into the water will recollect the partial stupor and unpleasant sensations which are thus induced, and would probably forego this most violent outrage on his feelings, were it not from a strong conviction of the utility of the precaution. As a proof that no advantage is gained by immersing the head, it is a very common practice with many persons to put on a cap when they bathe, so that the water is prevented from coming into contact with the head; and no incon-

venience arising from this practice is ever complained of. But let those who are not strongly prepossessed in favour of wetting the head, put the matter to the test of experiment; little doubt will remain of the result, when a comparison is made with the comfort and agreeable feelings which the bather will enjoy by avoiding this violent practice of total submersion, and the tingling ears, blinded eyes, and partial suffocation, which are occasioned by suddenly plunging the head under water. In one word, the benefits of the cold bath will most assuredly not be diminished by entirely omitting this practice; but if those who are eager to indulge in it, from an impression of its utility, feel no inconvenience or bad effects from it, they may persevere.

With regard to the management of the body after bathing, little need be said. Having remained the proper time in the water, the bather should leave it as quickly as possible, and he should be equally expeditious in drying the body with a cloth. When this is done, he should speedily resume his usual dress; and if convenient, it will

be found useful to take moderate exercise. By this management, if the body has not been too long in the water, and is thus too much cooled down, a glow of heat will soon diffuse itself over the surface, indicating that the proper and salutary effects of bathing have been induced. But in case, from delicacy of constitution, any chilliness, or other unpleasant sensations, should remain for any length of time after leaving the bath, it may be beneficial for those who bathe before breakfast to sit down as soon as convenient to that meal; and for those who do not bathe till some time in the forenoon, to take some warm soup, with the view of restoring the heat, and along with it the vigour of the body.

The observations now offered relate to cold bathing in general; but it may be proper to add, that although not the smallest doubt can exist of the beneficial effects of every kind of cold bath, yet where an opportunity of enjoying it occurs, bathing in sea water is always to be preferred: and in fixing on the best situation for the purpose of bathing in the open air, and reaping all

the benefit to be expected from it, whenever a selection can be made, the warmest and most sheltered situation should be chosen. Those, therefore, who have occasion to resort to the sea-side for the purpose of bathing, will do well, when it is in their power, to choose a place which is protected from the prevailing winds on that part of the coast. The propriety and advantage of this choice must be obvious; for, besides that bathing in such a situation will at all times be more comfortable, it may not only be continued with less interruption when the state of the weather renders it in more exposed places impracticable, but the period of the bathing season may, from local circumstances, be protracted: and it ought to be recollected, that these are advantages of no small value. Bathing is not to be expected to operate as a charm. Like many other safe and efficacious remedies, the utility of which depends on the regularity, constancy, and perseverance of their application, it will in many cases require to be long and steadily continued before its beneficial effects can be fully recognized. It must,

therefore, in this view, appear to be of material importance, that bathing, after it has been begun, should be carried on without interruption while it shall be deemed necessary to persevere in its use.

But the benefits of cold bathing are still farther improved where an opportunity offers of enjoying these benefits within doors; and at the same time it may be added, all the inconveniences of bathing in the open air, by which its salutary effects are often directly counteracted, are thus entirely obviated. Here the temperature of the air and of the water may be uniformly kept up nearly at the same degree; from the accommodations provided in buildings appropriated to this purpose, no time need be lost in undressing previously to bathing, or in dressing after it; and some time may be allowed to elapse before going into the open air, till the body has recovered its usual condition, and the glow of heat indicating the good effects of bathing begins to diffuse itself over the surface.

Many, and perhaps most of the advantages of cold bathing may be enjoyed with

no great inconvenience within doors, and at all seasons of the year. The shower bath, as it requires little space, and but a small quantity of water, is a very commodious apparatus for domestic bathing. But although to many persons it has proved, when persevered in, highly beneficial, yet to others, and to those seemingly of a constitution not more delicate, its effects have been sometimes injurious. The sudden application of the water to the body is one of the peculiar advantages of the shower-bath; and the only objection to its use with some persons, is the severity of the shock, particularly when the water falls directly on the head. The force of the shock might be diminished by having the apparatus so contrived that the water shall fall down gradually, and not in one sudden dash. By such a contrivance, I am persuaded, the shower-bath would be materially improved, and the objection now alluded to would be fully obviated. But even in its present form, the violence of the shock on the head may be avoided by bending the body forward to allow the stream of water to fall on the shoulders, or to incline

the body to one side, with the same view, or to have the head covered with a wax-cloth bathing-cap, or, as some have recommended, to have a board of seven or eight inches diameter so fixed, that the head shall be protected from the force of the current. Let me again repeat, for the sake of those who may not have adverted to what has been said on the subject of wetting the head in sea-bathing, that no apprehension or alarm need be entertained of a sudden flow of blood to the head, and all its direful consequences, by this practice; and let me assure the general reader, that wetting the head, either first or last, in the time of bathing, is no security against an event of so fatal a nature.

A common washing tub, with a moderate supply of water, may be employed as a substitute for the shower-bath; and, indeed, with this simple apparatus, which is within the reach of every family, without any additional expence, all the essential advantages of cold bathing may be always at command. The tub is about half filled with water, or, to such a height as, when the ba-

ther sits down in it, the water may not run over; with a quart jug, or any other convenient vessel, the water is poured successively on the shoulders, the back, and breast, either by the person who bathes, or an assistant; and as the whole operation may be completed in a few minutes, without exposure to the air, this simple mode of enjoying the cold bath possesses many advantages. With a little management, a bath of this kind may be employed in a closet or bedroom without spilling a drop of water; but even should this happen, the inconvenience of it may be obviated, by placing the tub on a piece of wax cloth. In a tub of the ordinary dimensions for domestic use, the whole body of children may be immersed; and in one somewhat enlarged in height and diameter, full grown persons may also have the benefit of total immersion.

In many cases it may be of some importance, when bathing is had recourse to within doors, to increase the temperature of the water. When a small quantity is employed, as in the shower bath, and the other method just recommended, it is easy to

bring the water to the temperature of the apartment in which the apparatus is placed, by filling the vessels the evening before the bath is used; if found necessary for delicate constitutions, this temperature may be elevated by the addition of a portion of boiling water, when a course of bathing first commences; and by diminishing the heat of the water a few degrees daily, it may at last, without inconvenience, be used at the ordinary temperature of the apartment or of the atmosphere.

I cannot conclude this section without reprobating in strong terms the method of bathing children in the sea, by throwing them backward into the water, and plunging them head and ears under its surface, at the very moment they are uttering, either from fear or obstinacy, the most piercing cries. This barbarous practice, I suspect, has its foundation in the prevailing prejudice of the absolute necessity of wetting the head on first going into the water, —a prejudice which, I trust, has been sufficiently combatted, and shewn to be groundless. But this practice, which is common

in this part of the country, and I fear is not unusual in most parts of the kingdom, has a direct tendency to counteract the beneficial effects of cold bathing, in consequence of the violent agitation into which the child is thrown, the involuntary dread that is excited, and the determined resistance, however feebly exerted, that is made. The practice, if it must be persevered in, is susceptible of some improvement, by immersing the poor sufferers with the face downwards; and if they are not taken unawares, they will naturally shut the eyes and mouth, by which the danger of suffocation, and many disagreeable feelings, may be in a great measure obviated. But if strong aversion, amounting in some cases to a kind of horror, exist in children to cold bathing, the use of it ought not to be urged, till the violent feelings are subdued by soothing measures; otherwise no good whatever can be expected from it, in opposition to any violent emotion.

Before proceeding to the consideration of the diseases in which cold bathing is found beneficial, it may be worth while to bring

into one view what has been said with regard to its proper use.

Concise Rules, founded on the preceding Observations, which should be followed in using the Cold Bath.

1. PERSONS of a delicate or feeble constitution should not bathe in cold water early in the morning; by others, any time in the early part of the day may be chosen for this purpose.

2. Cold bathing should never be employed unless the temperature or heat of the body is by exercise, or otherwise, somewhat increased, or even when a slight perspiration has begun.

3. When the body has been long exposed to exertion and fatigue, or after profuse sweating, when lassitude, debility, and chilliness prevail, the use of the cold bath should be dreaded and shunned.

4. When the body is in a proper degree of heat, undress as quickly as possible, and immerse it in the water.

5. To have the greatest benefit from cold bathing, remain a very short time in the water, not exceeding a minute or two, and during the whole time keep the body under the surface of the water.

6. On coming out of the water, wipe the body dry with a cloth, and quickly resume the ordinary dress.

7. After bathing, use moderate exercise to promote the return of the heat of the body, taking care that it be not violent or too long continued.

8. If chilliness partially or generally prevail, take breakfast after bathing in the morning; or in the forenoon, some warm soup.

Sect. 4.—*Of the Diseases in which Cold Bathing may be useful.*

It is not the object of this Treatise to give a full and detailed account of all the symptoms of the diseases in which beneficial effects may be expected from the use of the cold bath. For as it is addressed to those

who are not supposed to be familiar with all the deviations from the healthy state to which the body is liable, such a discussion would not only be useless, but, being misunderstood, might be injurious. Such being the case, it is proposed to point out briefly those complaints only in which cold bathing is obviously useful, and in which no danger of mistake or misapprehension can arise, even with the least discerning. Wherever any doubt or difficulty arises with regard to the utility or safety of the application, recourse should be had to the opinion of an experienced medical practitioner.

Fever.—The use of the cold bath in fever, it would appear, has been long known among different nations; but the practice was revived by the late Dr Wright, who experienced its advantages in warm climates. The late Dr Currie of Liverpool has demonstrated and proved its utility, by a great body of illustration, in his Medical Reports; and it may be added, wherever it has been pursued with judgment and vigour, the most beneficial effects have followed, either in stopping the progress of fever en-

tirely, abridging its period, or moderating the violence of its symptoms.

The affusion of cold water, rather than immersion, has been most generally employed; and as it is the speediest mode of application, it ought always to be preferred. But whatever be the mode adopted, the same cautions and rules that have been given to regulate the practice of cold bathing in general, should here be still more rigidly observed. These rules are, that it should be employed only during the hot stage of fever, when the heat of the body is preternaturally increased, when there is no chilliness, and when the sensible perspiration is not general or profuse. It is of the utmost importance to attend to these circumstances. The hot fit of fever usually comes on in the afternoon or evening; it is generally marked by restlessness, flushing of the face, and increased thirst; and the heat of the body, as indicated by the thermometer, will be found to be one or two degrees above the average heat of the fever. While these symptoms prevail, which is commonly between six and nine in the evening, the af-

fusion of cold water is safest and most beneficial.

But if this application be made during the cold stage, very different effects will follow. A temporary suspension of respiration is induced, the pulse is frequent and feeble, and the surface of the body, as well as the extremities, becomes colder and shrivelled. This remedy, therefore, should be cautiously avoided when any considerable degree of chilliness prevails, even although a greater heat than usual is indicated by the thermometer applied to the trunk of the body.

The use of the cold bath should also be avoided in fever, when the heat of the body is less than usual; it should be avoided too, when the heat is only equal to the natural standard, even although no degree of chilliness should prevail; and as this sometimes happens in the last stage of fevers, this discrimination ought to be carefully made.

It has been already hinted, that immersion in the cold bath may be useful and salutary when the body is under moderate

perspiration, and especially when this perspiration has been excited by exercise; and, indeed, this is recommended as a proper and necessary preparation for the use of the cold bath. But in feverish disorders, when profuse sweating has come on, and especially after it has continued for some time, the affusion of cold water should then be avoided; for instead of being beneficial, it would undoubtedly at this time be highly pernicious. By means of profuse perspiration the body is rapidly cooled, and thus it is brought to that state in which the use of the cold bath, as has been already shewn, would be extremely improper. It may then be adopted as a general rule, which should be rigidly observed, that the cold bath should not be resorted to in all cases where profuse sweating has been of any considerable duration; nay, it should not be employed in such cases, even although the heat of the body may appear at the time to be preternaturally increased, and this increase of temperature may be indicated by the thermometer. For it will be found, that after sweating has continued freely for some time,

the temperature of the body will sink greatly when it is exposed to the cold air; and still more so, when it is subjected to the affusion of cold water, or immersion in the cold bath.* Keeping in view the hints and cautions already given, the affusion of cold water may be employed at any period of fever; but the most beneficial effects may be expected from it when it is applied in the earlier stages; in the more advanced periods, its application is more doubtful and precarious.

But as these observations are not intended for medical practitioners, by whose opinion and advice the propriety of using the cold bath in fevers, where nicety of discrimination is required, ought always to be regulated, it would be quite unnecessary to enter farther into detail on this point. Those to whom they are addressed will be at no loss, by observing the rules laid down, in what circumstances cold bathing may be effectually employed in those slighter feverish disorders which are characterized by increa-

* Currie's Medical Reports, i. 19.

sed thirst and heat of the body, headache, and general uneasiness; a combination of symptoms which, on their appearance, when they exist without any local affection, come under the denomination of having caught a *cold*. In such cases, and particularly when the general uneasiness and the other symptoms become more troublesome towards the evening, the cold bath, either by affusion or immersion, may be safely had recourse to, and its use will be followed with the most salutary effects. A single application in proper time has often prevented a severe and tedious illness. But when affusion or immersion is inconvenient, very essential benefit may be obtained by sponging the body even partially, as the face, breast, arms, and legs; and the use of warm water in this way is often highly advantageous in diminishing the violence of the symptoms, and procuring refreshing repose.

The cold bath has often been peculiarly useful in removing a kind of slow, irregular fever, which is sometimes extremely troublesome to persons of sedentary habits, and particularly to those whose pursuits require

much attention and exertion of thought. Such habits are apt to induce anxiety of mind and irritability of constitution; and hence, without much deviation from the regular functions of the digestive organs, arise an impaired appetite, with a frequent pulse, a burning heat in the hands, and restless nights. A disorder of this kind, from the symptoms being at first slight, excites little uneasiness or alarm; but it often continues with irregular attacks for a long time, and with little interruption to the ordinary business of life, excepting that it renders it irksome and fatiguing. If, however, nothing be done to retard its progress, or to mitigate its effects, the symptoms become gradually stronger and more confirmed, till at last the disorder, as has not unfrequently happened, terminates in hypochondriasis, or some degree of mental derangement.

A disease of this kind, originating in a relaxed and debilitated state of the constitution, admits only of being removed by restoring its usual tone and vigour. The cold bath, employed according to the rules and precautions laid down, will be found to be

the most efficacious remedy that can be applied, not only in procuring relief from the symptoms, but what is of essential advantage, in preventing their recurrence. The rules and precautions ought to be more rigidly observed in proportion to the delicacy and irritable state of the constitution, and consequently the advanced stage of the disease. Cold bathing should be had recourse to on the first attacks of the disorder; and wherever an opportunity offers of cold bathing in sea-water, it should undoubtedly be preferred.

Intermittent Fevers.—Fevers of this character, to which persons who have resided in warm climates, or in the fenny counties of England, are extremely liable, and which, if long protracted without relief, prove most harassing complaints, have been entirely removed by the use of the cold bath, even after every other remedy had been applied in vain. But it is proper to observe, that cold bathing should not be resorted to in fevers of this kind, till it has been ascertained that no affection or induration of the liver or other viscera has taken place. This is by no

means a rare occurrence in those who have been long afflicted with intermittent fevers in tropical regions; and this being the case, cold bathing would be highly injurious.

Nervous Diseases.—Experience has shewn that many of the diseases which come under this denomination have been greatly relieved, and sometimes have been entirely cured, by the proper use of the cold bath, and particularly by sea bathing. In such complaints, sea bathing is recommended by some highly respectable medical writers.

Palpitation of the Heart, Hypochondriasis.—In these diseases, which indicate general debility of the nervous system, and are therefore denominated symptomatic, sea bathing has been found greatly beneficial. Want of sleep, one of the most distressing symptoms that accompanies these complaints, is often removed by its use.

St Vitus's Dance.—This is another nervous affection, which is often difficult of cure. Sea bathing has been found effectual in removing it.

Epilepsy and Convulsions.—In cases of epilepsy which occur previously to the time of puberty, and before the disease is habitually confirmed, sea bathing has effected a complete cure. It has proved equally beneficial in convulsive disorders, to which children are often liable. But before the cold bath is employed, it will be found useful to administer a mercurial purgative, as calomel, for the purpose of restoring the action of the bowels. Convulsions in children are often occasioned by the accumulation of slimy matter in the intestines; which latter is supposed to be in some measure owing to worms. This matter being carried off, the cold bathing invigorates the system, and thus prevents its future accumulation. According to the experience of some eminent practitioners, the utility of the cold bath is most to be depended on, when it is employed in convulsive disorders, during the height of the fit.

Hysterical Affections.—During the time of a hysteric fit, it is found that dashing cold water suddenly on the face and neck, puts an end to it; and in such cases, in the ab-

sence of the fit, sea bathing has been resorted to with great benefit, from its effect in restoring the general vigour of the system.

Chincough.—When this disease has continued a long time, it assumes what is called by medical writers the *chronic* form, when it is accompanied with a regular evening attack of fever, and wasting of the body. The beneficial effects of change of air, and especially of sea air, are well known in this disease; but after the cough has ceased, sea bathing may be resorted to with advantage, to recover the lost strength and vigour of body.

Nervous Headache.—Headache of this description most frequently depends on the disordered state of the stomach and organs of digestion; and in many cases much benefit may be derived from sea bathing.

Rheumatism.—Sea bathing has been strongly recommended by some in that stage or species of rheumatism which, from its long duration, is called *chronic.* This species often succeeds the inflammatory stage of rheumatism. Here the joints are affected with painful and puffy swellings. But in such

cases the utility of the cold bath seems doubtful, and therefore it should be resorted to with caution. When, however, the constitution is considered entirely free from the disease, sea bathing may be employed with the view of invigorating the system, and rendering it less susceptible of the operation of those causes which induce rheumatism.

Gout.—Cold bathing has been lately extolled by some as a safe and efficacious remedy, even during the height of a fit of this excruciating disease ; while the practice has been loudly condemned by others. In a point of such moment, it would be rash to decide on doubtful grounds. It will, therefore, be prudent to wait till future experiment and observation have finally settled it. But with a view to strengthen the constitution, and to prevent the recurrence of the disorder, or at least to mitigate its severity, the cold bath, during the intervals of the fits, prudently managed, may be attended with much advantage.

Constipation of the Bowels.—Every person is aware how much the health is affect-

ed by any irregularity in the digestive or excretory organs. When the stomach and bowels are disordered, the whole system is deranged. Some cases of obstinate costiveness have occurred, which, after having resisted the most active internal medicines, have yielded to the simple remedy of dashing cold water on the lower parts of the body; but in less violent cases, sea bathing will be found beneficial in restoring the regular action of the bowels. Persons of sedentary habits are peculiarly liable to disorders of this kind. To them, therefore, cold bathing will be highly useful, in exciting the diminished action of the bowels, and in renewing the tone and vigour of the whole system.

Bilious Complaints.—Most of the complaints which are usually and indiscriminately ascribed to an excess or accumulation of bile in the stomach, are really owing to indigestion and general debility; and were this the proper place, it would be easy to shew that such is the nature of the diseases which come under this very general and of late fashionable designation. Unless therefore it appear, from attentive examination,

that there really does exist some affection of the liver, the cold bath, and perseverance in its use, adhering strictly, at the same time, to a moderate and cooling regimen, and avoiding, if necessary, vegetable food, will be found singularly beneficial.

Sore Throat.—There are two diseases which, in common language, come under this denomination, and which, as they are characterized by distinct symptoms, may be easily recognized. In the one, the internal surface of the throat and breast is inflamed. This appears from the sensation of heat, and from the soreness and rawness of the throat, which are accompanied with troublesome, frequent, and tickling cough, and sometimes with hoarseness. The first attacks of this kind of complaint of the throat are often successfully resisted by the topical application of the cold bath. Cloths dipped in cold water, and applied externally to the throat and breast, wiping afterwards with a dry cloth, and covering up with flannel, will often arrest the progress of the disease. But to those who are subject to such complaints, general cold bathing may be safely recommended as a

simple and efficacious remedy in preventing the recurrence of the disorder.

The other species of disease of the throat is accompanied with swelling and pain of the glands at the sides of the throat and under the jaw, and with difficulty of swallowing, especially liquid substances. In this species, when the inflammatory symptoms run high, suppuration is the consequence. Some persons, and especially those of a sanguine temperament, are peculiarly liable to the attacks of this kind of sore throat, during the variable state of the season on the approach of winter and spring; and to them cold bathing will be found highly useful. But it ought to be observed, that the cold bath is not recommended during the attack of the disease. This might prove extremely hurtful, and therefore must be avoided. But when the symptoms have disappeared, it may be efficaciously employed in bracing the system, to enable it to resist the operation of those causes which are apt to induce this troublesome and painful disorder.

What has been called *aphthous* sore throat, is considered also as a peculiar spe-

cies. Persons of a delicate constitution, who reside much in crowded cities, are liable to this species, which is characterized by a sallowness of complexion, listlessness, and aversion to exertion, relaxation of the uvula, and somewhat of a honey-comb appearance of the glands in the inside of the throat. Cases have occurred, in which this disease has been induced by anxiety of mind; and in others, most frequently in females, it is occasionally attended with a total loss of voice, which sometimes suddenly supervenes. Sea bathing has been here found beneficial; but it has sometimes happened, that the disease has recurred on returning to town and former occupations. This recurrence might perhaps be prevented by persevering longer in sea bathing; or, if this cannot be conveniently accomplished, by having recourse to the cold bath, in fresh water, within doors; and even the simple application of a sponge or towel, dipped in cold water, to the throat, morning and evening, has, in some cases, obviated the tendency to every species of this disease.

Inflammation of the Eyes.—The most decided experience might be adduced of the beneficial effects of cold bathing in certain stages of inflammation of the eyes. When, indeed, the inflammatory symptoms, such as the pain, swelling, and intolerance of light, are violent, it is scarcely necessary to observe that cold bathing ought not to be employed. But when these symptoms have abated, sea bathing will be found the most efficacious remedy in removing the weakness which is the consequence of such affections, and which not unfrequently becomes habitual and extremely troublesome.

Scrophula.—Of the benefit to be derived from cold bathing in scrophulous affections, much doubt may be entertained. No remedy, indeed, has been more generally resorted to; so that any hint which seems to controvert a fashionable practice will be received with hesitation. When the disease has assumed an active form, when any of the glands, which are the seat of this disease, exhibit symptoms of inflammation, as swelling, redness, pain, and tendency to suppura-

tion, and when suppuration or ulceration has actually commenced, the use of the cold bath ought most assuredly to be laid aside. But persons, especially in the earlier periods of life, who seem constitutionally affected with scrophula, or have this peculiar habit of body, will certainly receive great benefit from sea bathing, before the disease has appeared in swellings of the glands of the neck, or of the joints; which latter is usually termed *white swelling*. In such cases, cold bathing, with a generous regimen and moderate exercise in the open air, may be safely recommended as proper and useful, with the view of invigorating the system.

Rickets.—Sea bathing is highly beneficial in this disease; and is considered by some as the best and most effectual remedy in strengthening the constitution, and thus enabling it to resist the tendency to the disorder.

Female Complaints.—Cold bathing is undoubtedly useful in many disorders to which females, at different periods of life, are subject. But here some discrimination is necessary, to ascertain when it may be

safely and beneficially resorted to, and when it ought to be avoided.

In chlorosis, which comes on about the time that the constitution of the female is approaching to maturity, much benefit may be expected from cold bathing when it is judiciously directed; and those who experience its invigorating and refreshing effects should persevere in its use; but to those who have a pale complexion, a feeble pulse, and a languid habit of body, accompanied with slight swelling of the extremities, the cold bath is usually hurtful. The utility of the warm bath, in such cases, will be afterwards noticed.

Excessive menstrual discharges, and others of a similar nature, are often checked by the proper use of the cold bath. The tendency to abortion, connected perhaps with irregularity or excess in these discharges, or arising from peculiar habit or delicacy of constitution, will be obviated by sea bathing; and, indeed, the cold bath may be employed not only safely but beneficially during the whole period of pregnancy, by those who have

been accustomed to its use from the beginning.

Debility of Constitution.—After a long course of mercurial medicines, the strength and vigour of the body are greatly reduced. Sea bathing has been found, from experience, to be a more powerful remedy in obviating and removing the weakness and irritability which are induced by the use of such active medicines, or occasioned by the disorders for which they are administered, than any means that have yet been devised. The only precaution to be observed is, that in cases where mercurial medicines have been exhibited, their effects should be allowed to pass off before recourse is had to the cold bath, otherwise its use might prove injurious rather than beneficial.

CHAP. II.

OF WARM BATHING.

THE warm bath, as has been already observed, was greatly employed as a luxury by the Greeks and Romans. In the more degenerate days of the latter people, it became so prevailing and attractive a gratification, that it seems to have been a serious object with the emperors to erect immense buildings for this purpose, with the view of acquiring popular favour; and the ruins of some of these splendid establishments, which exist at this day, justly excite the wonder and admiration of every traveller. The baths of Dioclesian, it is said, exceeded all the others in magnificence and extent; and those of Caracalla, according to some authors, were so large as to admit conveniently, not fewer than 1800 persons to bathe at the same time.

Water heated to a proper temperature is most generally employed for warm bathing. In some countries the vapour bath is preferred. This kind of bath was greatly used by the ancient inhabitants of Mexico, as well as by their descendants at the present day. The vapour is obtained by throwing water on heated stones, in a kind of furnace or close apartment, in which the person who uses the bath stretches himself on a mat.* A vapour bath, somewhat similar, is in use among the peasants of Finland.† The vapour bath is also a frequent luxury among some of the Eastern nations.

In this country, except for topical affections, water is solely employed for the purpose of warm bathing; and from its having become, in different parts of the world, both in ancient and modern times, an idle and luxurious enjoyment, an unfavourable opinion of its utility long prevailed. But at present, the benefits which have been derived from the warm bath seem to have pro-

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* Clavigero, Hist. of Mexico, i. 429.

† Acerbi's Travels.

duced a different impression on the public mind; and the numerous accommodations which of late years have been established, and to which crowds annually resort, shew that it is not regarded merely as a luxury; and indeed, when the benefits obtained from warm bathing are better known, no doubt can remain that a practice so salutary will be facilitated and extended. Here, then, it may be worth while to consider, 1. The effects of the warm bath on the living body; 2. The temperature and time of using it; and, 3. The diseases in which it is found beneficial.

SECT. 1.—*Of the Effects of the Warm Bath on the Body.*

THE first sensible effect of the warm bath on the body is the sensation of warmth; and this effect is perceived although the temperature of the water be some degrees inferior to the heat of the body. This sensation of warmth is no doubt partly excited by the increased heat of the water, in which the

body is immersed, above that of the air of the atmosphere. This effect follows when the water is heated a little above 90°, which is considerably below the heat of the body; and it has been proved, by experiment, that it is not merely dependent on the change of the medium, and the relative temperature of the air and water, but that there is a real increase of heat. In a short time after immersion in water heated to 93°, the thermometer previously introduced into the mouth, when it stood at 98°, was observed to rise to 100°. After a quarter of an hour had elapsed, during which time the temperature of the bath remained stationary, the thermometer fell to 98°, and stood at that degree while the experiment was continued. The following explanation has been given of these phenomena. The heat of the body is regulated by the process of transpiration, or secretion from the skin; but this process is for a time interrupted, while the body is completely surrounded by a dense medium like water; and while this interruption continues, the heat of the body is accumulated, which augmented heat is indicated by the

thermometer: but when the balance of the powers, which have operated this change, has been restored, the heat of the body returns to its former standard.

The warm bath also affects the respiration. During the immersion the respiration is observed to be somewhat slower than usual. This retardation is ascribed to the increase of weight of water to be displaced during each inspiration, so that some degree of voluntary effort is required to elevate the ribs and distend the chest; but on the cessation of this exertion, the chest, by the additional weight of the water, rapidly subsides, and forces the air suddenly from the lungs. From this, it would appear that the inspiration only is retarded, and that the expiration is accelerated. But may it not be suspected that experiment and observation are still wanting fully to verify these facts, and that this change in the respiration, in consequence of immersion in warm water, is owing to some other cause?

The effects of warm bathing are not to be limited entirely to its preventing the escape of heat, and thus producing an accumula-

tion in the body. It has been clearly ascertained that there is a copious and constant secretion going on from the surface of the body. In a set of elaborate experiments which were conducted by Seguin and Lavoisier, the nature of this function has been particularly investigated, and the relation between the secretion from the lungs and that from the surface of the body determined. It may perhaps be considered as a curious piece of information to state the whole quantity transpired, on an average, from the lungs and surface of the body, in a man not using laborious exercise, as it was ascertained in the above experiments. This quantity amounted to 18 grains every minute, 2 oz. 2 dr. every hour, and 54 oz. in the course of twenty-four hours, taking the rate of the quantity thrown off to be always the same. But this quantity, it must be observed, is liable to considerable variation with regard to diminution and increase from increased or diminished exercise and heat.

A very general opinion had prevailed previous to the experiments above alluded to, that part of the fluid was absorbed by the

pores of the skin during the immersion of the body in warm water; so that, by impregnating baths with substances of a nutritive quality, it was supposed that life might be supported when the stomach, from disease, could not admit or digest the proper quantity of food. But it has been clearly and fully proved, that no such absorption or inhalation takes place by the skin, while the external cuticle remains unimpaired.

These experiments have been mentioned for the purpose of stating some conclusions of considerable practical utility, which may be obviously deduced from the facts thus established. From this view of the nature of the functions of the animal economy, the grateful feelings and renovated vigour, which are the result of warm bathing properly regulated, may be satisfactorily accounted for. The body, after immersion for some time in water, heated to such a temperature as not to quicken the circulation, was accurately weighed; and it was found, that the quantity of matter perspired was only equal to about two-thirds of what would have been lost, had the same person remained exposed

to the air for the same length of time. During immersion, it is to be observed, the access of air being prevented, the perspiration from the skin is thus suspended, while that from the lungs goes on as usual. Not aware of this temporary suspension of the perspiration from the skin during immersion in the warm bath, the small loss of weight sustained by the body, while compared with what happens in the open air, may have misled less accurate observers, and brought them to suppose that an absorption of the fluid in the bath actually took place. Another fact admits of explanation from these experiments. It has been observed that thirst is alleviated by the immersion of the body in water. This is to be accounted for from the circumstance of the interruption of the cutaneous perspiration, and not on the supposition that any thing is received into the body.

It was found also by the same philosophers, that when the temperature of the water was raised so high as to accelerate the circulation, and increase the action of the exhalants to discharge their contents in the

form of sweat, notwithstanding the density of the medium in which the body was placed, and its consequent pressure on the surface, the loss of weight, even during immersion in the bath, was considerably increased.

From what has been stated of these curious experiments, it will not be difficult to conceive why immersion of the body, after being exhausted by exertion, in a bath heated to the temperature of 90°, or some degrees higher, should be so grateful and refreshing; for by its effects the immediate causes which produce debility and lassitude are removed; the waste of the matter perspired is checked; and the loss of heat, which passes off during the process of perspiration, is prevented. In this state of the body, the utility of warm bathing will be found no less proper, and its effects no less salutary, than immersion in cold water, as has been already shewn, would prove improper and injurious.

It would lead into unnecessary discussion particularly to trace the history of warm bathing among the ancients, and of the abuses which afterwards crept into the prac-

tice, and which, perhaps, may have been in some degree the means of bringing it into disrepute even in modern times. It was originally employed for the purpose of refreshment after fatigue. Those who had been engaged in violent exercises, as was the case in some of the favourite amusements of the Greeks, found their exhausted vigour renewed, and their depressed spirits elevated, by immersion in the warm bath; but, from being an useful and invigorating practice, it degenerated at last into a mere luxury; and from the too frequent use of warm bathing, its effects, at the same temperature, as might be expected, gradually diminished; so that it became necessary, for the purpose of having the same degree of enjoyment, to increase the temperature. The obvious consequence of this increased temperature was, that the body was debilitated and relaxed, instead of being refreshed and invigorated. At one period of the Roman Republic, it was the duty of some of the public officers to see that the heat of the public baths was properly regulated, before the people were admitted to them; but af-

terwards, when this beneficial precaution was neglected, it appears to have been no unusual thing to raise the heat of the water nearly to the boiling temperature. It is not therefore to be wondered at, that debility and disease should be the certain consequences of exposing the body to the action of heat in a medium so much higher than its own temperature. But these pernicious effects will be avoided by proper attention to regulate the temperature of the bath; and by this attention to the regulation of the heat, the practice of warm bathing, in consequence of the agreeable and salutary effects which may be obtained from it, will be more generally followed than it has hitherto been.

SECT. 2.—*Of the proper Temperature and Time of Using the Warm Bath.*

ONE of the greatest abuses of the warm bath is that which has been mentioned above, and which was very prevalent in the degenerate times of the Romans. When

the heat is too great, effects, the very reverse of what should be expected from it, take place; for then, instead of increasing, it diminishes the vigour of the body.

When the water is under the temperature of 90°, it scarcely comes under the denomination of a warm bath; but the increase of a few degrees of temperature above that point, will be found to produce a material difference in its effects on the body. When the heat of the bath is raised to 98°, which is about the temperature of the human body, it generally quickens the pulse; and it is observed, that this effect follows when the water of the bath is at a lower degree of heat in the evening than before dinner. When it is proposed to excite perspiration by means of the warm bath, the heat should be gradually increased during immersion, till it is raised to the temperature of 100°. At this temperature the pulse will be accelerated, and the increased perspiration will appear on the face; and this increased action, should it be thought necessary, may be kept up for some time, by

going immediately from the bath to a warm bed.

It ought to be recollected, that the sensation of warmth depends on the relative change of temperature to which the body is exposed; so that the senses ought not to be trusted in regulating the heat of the water employed in warm bathing; for if one part of the body has been some time in a cold medium, water at a low temperature will feel warm, while another part of the body exposed to a warm medium, when immersed in the same water, experiences a sensation of cold. This shews the propriety, and indeed the necessity, of regulating the temperature of the bath by means of a thermometer. The neglect of this precaution has sometimes occasioned serious accidents; for the body can bear a degree of heat which will produce hurtful consequences if it be gradually increased, and even with an increased sensation of pleasure. One case is on record, of the effects of inattention to the regulation of the temperature of the warm bath by the thermometer. A gentleman, to whom warm bathing had been recom-

mended, experienced a very agreeable sensation after immersion; and not aware of the danger of increasing the temperature, added more warm water, with the view of increasing the pleasure: the consequence of which was, from the excessive heat of the bath, that the circulation was accelerated, and a slight paralytic affection was induced.

The best and most obvious rule that can be given for regulating the warm bath, except in cases where it is to be employed with a particular view, is, that the heat should never be so great as to accelerate the circulation, or quicken the pulse. It has indeed been asserted by some writers on warm bathing, that the frequency of the pulse is uniformly reduced in a bath whose temperature does not exceed 96°; but it seems probable that this position is susceptible of considerable variation from different circumstances; such as peculiarity of constitution, and the time of the day when the bathing is employed.

It appears from general experience, that the most beneficial effects may be expected from the use of the warm bath at a temper-

ature between 90° and 95°. At this temperature, it seems to be fully ascertained that it may be used with much advantage and with perfect safety; and, excepting with some particular view, it ought never to be resorted to at a higher degree of heat, otherwise the danger from its stimulating effects is considerable; and, indeed, it is extremely probable that the debilitating or relaxing effects of the warm bath, as they have been denominated, with some degree of opprobrium, have arisen from inattention to the proper regulation of the temperature. Perhaps, too, some of the bad effects which are ascribed to warm bathing, may have been produced by employing it at an improper time of the day.

Daily experience shews that the circulation, even in persons who enjoy perfect health, is considerably accelerated towards the evening. It is of little importance to inquire, whether this augmented circulation, and increased frequency of pulse, is to be ascribed to the stimulating effects of food, or to the debility which succeeds the exertions of the body during the day, or to the ope-

ration of both these causes. But the fact is certain, and its application is obvious in regulating the use of the warm bath. If, then, warm bathing be resorted to in the evening, while the body is in this state of increased irritability, the tendency will be still farther to increase it; and hence it happens, that the warm bath employed late in the evening, has not had the effect of soothing and refreshing the system, and thus producing agreeable repose, but has been often followed by a watchful and sleepless night.

Keeping then this in view, the most proper time for the use of the warm bath seems to be about an hour or two before dinner. The warm bath is probably employed seldomer at this time of the day, from an erroneous opinion of the consequences, according to which, it is supposed, that the body, on exposure to the air, is more susceptible of catching cold; but this opinion is founded on inaccurate observation, and want of discrimination of circumstances. It is no unusual thing for feverish complaints to be induced by exposing the body to cold air after it has been heated and exhausted by immer-

sion; but the state of the body is very different after immersion in the warm bath. When the body has been subjected to exertion and fatigue, the augmented perspiration rapidly diminishes its heat; but when it is placed in a medium about its own temperature, the heat is not only prevented from escaping, but it is perhaps accumulated; from which accumulation the body is better able to resist the action of cold after coming out of the warm bath; and in this view, there would be the same risk of catching cold by leaving a warm bed and going into the open air when the temperature is at 32°, as after immersion in the warm bath. No more danger need be apprehended in the latter than in the former case, which is too familiar ever to be the subject of a thought.

The proper time and manner of using the warm bath have occupied the attention of Count Rumford; and an experiment, made with his usual accuracy on his own person at Harrowgate, affords so apt an illustration of the points under discussion, that it will probably be deemed worth while to quote it at length in his own words. "Being at Har

rowgate," he observes, "on account of my health, I at first went into a bath, warmed to about 96° of Fahrenheit's thermometer, every third day. At first, I went into the bath about ten o'clock in the evening, and remained in it from ten to fifteen minutes; and immediately on coming out of it, went to bed, my bed having been well warmed, with a view to prevent my *taking cold.*

"Having pursued this method for some time, and finding myself frequently feverish and restless after bathing, I accidentally, in conversation, mentioned the circumstance to an intelligent gentleman, who happened to lodge in the house, and who had been in the habit of visiting Harrowgate every year. He advised me to change my hour of bathing, and to stay longer in the bath; and above all, to avoid going into a warm bed on coming out of it. I followed his advice, and shall have reason all my life to thank him for it.

"I now went into the bath regularly every third day, about two hours before dinner, and staid in it half an hour; and in coming out of it, instead of going into a warm

bed, I merely had myself wiped perfectly dry with warmed cloths, in a warmed room adjoining to the bath ; and dressing myself in a bed-gown, which was moderately warm, I retired to my room, where I remained till dinner time, amusing myself with walking about the room, and with reading or writing, till it was time to dress for dinner.

"The good effects produced by this change of method were too striking not to be remarked and remembered. I was no longer troubled with any of those feverish heats after bathing, which I experienced before ; and so far from being chilly, or being particularly sensible to cold on coming out of the bath, I always found myself less sensible to cold after bathing than before. I even observed repeatedly and invariably, that the glow of health, and pleasing flow of spirits, which resulted from the full and free circulation of the blood, which bathing had brought on, continued for many hours, and never was followed by any thing like that distressing languor which always succeeds to an artificial increase of circulation

and momentary flow of spirits, which are produced by stimulating medicines.

" I regularly found that I had a better appetite for my dinner on those days when I bathed, than on those when I did not bathe; and also that I had a better digestion and better spirits, and was stronger to endure fatigue, and less sensible to cold in the afternoon and evening.

" As these favourable results appeared to be quite regular and constant, I was induced to proceed to a more decisive experiment. I now began to bathe every second day; and finding all the advantageous effects which I had before experienced from warm bathing still continued, I was encouraged to go one step farther, and I now began to bathe every day.

" This experiment was thought to be very hazardous by many persons at Harrowgate, and even by the physician, who did not much approve of my proceedings; but as no inconvenience of any kind appeared to result from it, and as I found myself growing stronger every day, and gaining

fresh health, activity, and spirits, I continued the practice, and actually bathed every day at two o'clock in the afternoon, for half an hour, in a bath at the temperature of 90° and 97° of Fahrenheit's scale, during thirty-five days.

"The salutary effects of this experiment were perfectly evident to all those who were present and saw the progress of it, and the advantages I received from it have been permanent. The good state of health which I have since enjoyed I attribute to it entirely." *

The authority of Dr Currie, whose attention has been so much occupied in considering the nature and effects of bathing, will be admitted to have great weight. The following quotation contains his sentiments on the temperature and time of using the warm bath: "The effects of the warm and tepid bath," he observes, "though more investigated (than the effects of the cold bath,) are scarcely better understood; for perhaps

* Observations concerning the Salubrity of Warm Bathing.

there is no part of medicine on which so much has been written, and so little has been decided. These subjects are connected together, and might form, with great advantage, part of an experimental inquiry into the laws of animal heat. The commonly received opinion, that the warm bath relaxes and enfeebles the system, must, I apprehend, be admitted with many restrictions. Immersed in water or in air heated to the degree that quickens the circulation, we are doubtless speedily enfeebled; but by a heat short of this effect, it may be disputed whether debility is ever produced. The degree to which the bath must be heated in order to quicken the circulation, approaches nearly to that of the blood. In my own case, I have found the pulse become more frequent at 96°, when the stomach was empty, than at 94° after dinner; and the practice, said to have been adopted by the ancients, of going into the bath to relieve themselves from the oppression of an overloaded stomach, would appear to me to have been attended with some hazard, and with great inconvenience. It does not indeed appear how

the desired effect was obtained, except through the means of profuse sweating. In future experiments respecting the effects of the warm bath, it will be of importance to observe the heat at which the sensible perspiration begins to flow; which probably varies a good deal in different constitutions, and which, as it varies, will materially affect the results. It will be important also to notice the state of the stomach as to fullness, the condition of the pulse, the previous degree of exercise, and the actual heat of the surface; all of which, according to my observation, will influence the experiments.

"In all inflammatory diseases, it is of importance not to use the bath heated to the degree that materially quickens the circulation; where this is not attended to, the symptoms are heightened, unless, indeed, a speedy and profuse perspiration ensues. In the degrees in which it does not quicken the circulation, the warm bath is soothing and sedative, especially when the immersion is prolonged; and it is the temperature from 90° to 95° that is so singularly restorative after fatigue, though a still lower heat is

safe and refreshing, as those who have used the baths of Buxton can testify.

"The warm bath is frequently employed to excite a sensible perspiration, which may be prolonged after leaving it; and in this way it may be used with great advantage. Where this object is in view, it is advisable to immerse the patient in the water heated to 94° or 95°, and very gradually and slowly to increase the heat to 97°, or perhaps 98°, watching its effects. When the sweat begins to appear on the forehead, if the pulse remains calm, and the patient feels at ease, an increase of heat to 90° or even 100° may be ventured on with safety, should profuse perspiration be required; but when the bath is heated *in the first instance* to 100°, the stimulus of heat generally produces a feverish circulation, which the subsequent defective perspiration cannot allay. The injurious effects are still greater where the bath is heated at first to 105° or upwards; and sweat, instead of flowing more freely in consequence of the increased temperature, is discharged with greater difficulty; the stimulus of the heat, and the suddenness of

its application, inducing a contraction of the orifices of the extreme vessels of the skin. In this respect, as in most others, the analogy is perfect between the stomach and surface; for it will uniformly be found, that sweating is excited more easily by draughts of tepid liquor, than an equal quantity of the same fluid swallowed as hot as it can be borne.

"The sensible perspiration excited in the warm bath does not lower the temperature of the body while immersed; but being prolonged afterwards, it becomes powerfully refrigerant, and is a remedy of great efficacy. These observations, however, shew the importance of regulating the temperature of the warm bath by the thermometer, and demonstrate how little dependance can be placed on the observations of those writers who speak of its effects without noting its temperature. A variation of two or three degrees, often impossible to be ascertained by the sensations, will not merely vary the degree, but alter the nature of its effects."*

* Medical Reports, i. 283.

As the topical warm bath, or fomentation with warm water, often produces the most powerful effects, it may be worth while to describe the most efficient method of using it. A coarse towel is to be stretched over a wide basin, and a large piece of coarse flannel, at least half a yard square, is wrapped together and placed upon the towel. Boiling water from a kettle is poured upon the flannel till it is thoroughly wetted; the flannel is then wrapped up in the towel, and the water wrung out of it by two assistants. The moist flannel is then folded up in a convenient form to be applied to the place where the fomentation is required. If it should be too hot, which is sometimes the case when the water employed is at the boiling temperature, it may be cooled down to the proper degree, by holding it up unfolded in the air for a few seconds. The higher that the temperature is, the greater will the effects be from the application, provided the skin to which it is applied do not become tender, which would thus frustrate its beneficial effects. The heat, therefore, must be regulated by the feelings of the pa-

tient, excepting in the case of children, when it must be judged of by the attendants, who, to avoid the injurious consequences alluded to, must employ greater precaution.

That the heat produced by fomentation may be continued without interruption, two pieces of flannel should be provided, so that while the one is applied, the other may be in a state of preparation. Three or four minutes is generally a sufficient length of time for one application. The time of continuing the fomentation, it is obvious, must be regulated according to the urgency of the case.

The partial vapour bath, from which the most beneficial effects are often obtained, is in the power of every person who can command a little boiling water. A jug, or other vessel, with a narrow mouth, which is capable of holding about two quarts, or any convenient size, is to be filled about three-fourths with boiling water. When the vapour is to be inhaled by the mouth, as in cases of inflammation of the throat and breast, the opening of the vessel is to be

covered with a towel, leaving only a space for the mouth and nose. In other cases, the parts to which the vapour is directed, must be held over the vessel containing the water.

What has now been detailed in the two foregoing Sections, on the nature, effects, and temperature of the warm bath, as well as the proper time for using it, may be summed up in the following concise rules.

Rules to be observed in using the Warm Bath.

1. When the bath is employed for the purpose of refreshment after fatigue, the temperature should never exceed 90° or 94°; or it should never be so high as to quicken the circulation.

2. For the same purpose, the time of remaining in the bath should not be less than twenty minutes, or half an hour.

3. On coming out of the bath, the body should be wiped dry with warm cloths, and the usual dress resumed.

4. The most proper time of bathing is when the stomach is empty, or an hour or two before dinner. Never go to bed immediately after warm bathing.

5. The warm bath should never be used in the evening: for then it is apt to accelerate the circulation, and thus to produce feverishness and restlessness during the night.

6. When the warm bath is employed to produce sensible perspiration or sweat, let the temperature be 94° or 95°; gradually increase it to 97° or 98°; and if profuse sweating be required, raise it to 99° or 100°, provided the pulse be not quickened.

7. When the perspiration appears on the face, the patient is to be removed to bed, after wiping the body, and there the sweating is prolonged while it is necessary.

SECT. III.—*Of the Complaints in which Warm Bathing is found useful.*

THE preceding observations on the nature and effects of the warm bath, will in

some measure suggest its utility in various diseases; and from a consideration of the nature of the disorder and the cure required, will shew in what cases, and how far, it may be safely and beneficially resorted to. It will not therefore now be necessary to enter into any long discussion on the use of warm bathing as a remedy in disease. In what follows, it is proposed to state briefly some of the complaints in which the warm bath is obviously useful; but it may be worth while previously to notice some of the more general effects of warm bathing, as it is beneficial in the early periods of life, on the approach of old age, and on account of its detersive properties.

During the earlier periods of life, the warm bath, employed under proper regulations, would certainly be of essential service in promoting and invigorating the general health of the system. It would probably be no less useful in preserving the skin in that degree of softness and openness which are closely connected with a healthy state of the body. In many cases, too, from its action on the skin, warm bathing might tend to

facilitate the progress, and by this means diminish the danger of various eruptive diseases to which the earlier stages of life are subject. This practice would infallibly be followed by very different effects from that which is too prevalent in this country, of immersing children by force into the cold bath or open sea, inducing such alarm and terror as often to excite convulsions;—a barbarous practice, which has been already alluded to, but can never be too much reprobated.

The warm bath has been strongly recommended on the approach of old age, when the secretions and various other functions begin to be less active and vigorous. In such cases, it may be regarded as one of the most grateful enjoyments of declining life; supporting and renovating the diminished heat, and thus retarding, as it were, the progress of old age. On the utility of warm bathing, in this point of view, Dr Darwin has the following observations: "The story of Æson," he observes, "becoming young, from the medicated baths of Medea, seems to have been intended to teach the efficacy of warm bath-

ing in retarding the approach of old age. The words *relaxation* and *bracing*, which are generally thought expressive of the effects of warm and cold bathing, are mechanical terms, properly applied to drums or strings, but are only metaphors when applied to the effects of cold or warm bathing on animal bodies. The immediate cause of old age seems to reside in the irritability of the finer parts or vessels of our system; hence these cease to act, and collapse, or become horny or bony. The warm bath is peculiarly adapted to prevent these circumstances, by its increasing our irritability, and by moistening and softening the skin, and the extremities of the finer vessels which terminate in it. To those who are past the meridian of life, and have dry skins, and begin to be emaciated, the warm bath, for half an hour twice a-week, I believe to be eminently serviceable in retarding the advances of age." * The following anecdote of the practice of the celebrated Franklin, recommended to him by the same ingenious

* Loves of the Plants.

physician, is farther illustrative of the same opinion: "When Dr Franklin," says Dr Darwin, "the American philosopher, was in England, I recommended to him the use of a warm bath twice a-week, to prevent the too speedy access of old age, which he then thought that he felt the approach of; and I have been informed that he continued the use of it till near his death, which was at an advanced age." *

It cannot be doubted, that the warm bath may be highly useful, merely on account of its detersive properties; and when it is employed with this view, as a cleanser or purifier of the skin, the temperature may be regulated from 85° to 95°. When the secreted matters are allowed to collect and remain on the skin for any length of time, it is not without reason supposed, that by obstructing perspiration, they must give rise to different cutaneous diseases. It must therefore be of great importance to the health of the body, which depends so much upon the state of the skin, and the proper action of its ves-

* Zoonomia, p. 686.

sels, to have all the extraneous matters removed as soon as they are deposited on its surface. This is most effectually accomplished by the occasional use of the warm bath. It was a custom with the ancients to employ the leaves of the mallow, or the dry flower of a species of vetch, for rubbing the surface of their bodies while in the warm bath. Common bran, or what is known by the name of almond meal, might perhaps be used as a valuable substitute for the same purpose, and with equal effect.

Hectic Fever.—In the fever which comes under this denomination, the strength of the pulse is diminished, but it is increased in velocity; and these symptoms are accompanied with a falling off or wasting of the body. Here warm bathing will be found an efficacious remedy. Even the hectic fever which accompanies consumption, admits of a temporary alleviation by the use of the warm bath. Much benefit is often obtained in this kind of fever merely by sponging the face, breasts, arms, and hands with warm water.

Chronic Weakness.—The symptoms which attend this complaint are a quick pulse, a shrunk or shrivelled appearance of the skin, and sleepless nights, without any local diseased affection. Such cases, which frequently resist the effects of the most powerful medicines, receive great benefit from the use of the warm bath. Here it ought to be observed, that in this peculiarly irritable state of the constitution, cold bathing, being generally hurtful, should be avoided.

Spasmodic Cough.—This troublesome complaint, as well as other nervous affections, are often greatly relieved by the use of the warm bath. Even the partial application of warm water to the inferior extremities, has proved one of the best remedies in obviating or mitigating those convulsions which sometimes are induced previously to the eruption in diseases of the skin.

Colic Pains, &c.—In these severe complaints, the utility of warm bathing is not sufficiently known. It may be employed either generally or topically, and in both ways with great advantage. Warm bathing is also found highly useful in that species of

colic which is occasioned by the poison of lead; and it rarely fails in proving beneficial, by mitigating the severity of the pain which is produced by the stoppage of biliary calculi in the duct of the gall bladder. In all these cases fomentation will be found most effectual in procuring immediate relief. The topical warm bath is peculiarly effectual in those griping pains to which infants are frequently liable, and which are easily recognized by their severe crying, and drawing up the feet.

Gravelly Disorders, &c.—Great benefit has been often obtained from the use of warm bathing in many of the affections of the urinary organs. The pain which is occasioned by the passage of gravel along the ureters, when it is interrupted by the spasmodic contractions of these organs, and even when it descends along the urethra, is greatly mitigated by immersion in warm water; and the terrible pain which is produced during a fit of the stone is often moderated and relieved by the same means. It may be added, that warm bathing will be of the utmost service in all the inflammatory affec-

tions of the kidneys. Here, too, the most powerful effects may be expected from topical bathing or fomentation.

Rheumatism, &c.—In that species of rheumatism which is not accompanied with fever or inflammatory symptoms, and which is called *chronic*, warm bathing has been often found so highly beneficial, that it may be regarded in some measure as one of the most certain remedies against this harassing disorder. In some modifications of gout and palsy, the utility of warm bathing has been very considerable.

Fistulous Ulcerations and Piles.—In fistulous sores of the perinæum, which, from the peculiar state of the parts in which they are situated, are extremely troublesome and difficult of cure, much benefit has been derived from the use of the warm bath. It is recommended to continue the immersion in water, which is agreeable to the feelings, for an hour daily; and by this practice it appears, that the pain and irritation are greatly alleviated, and a disposition to heal is induced on the ulcerations. These ulcerations

are often the consequence of piles, which might be completely obviated by fomentation on the first attack of the disease. When the pain and swelling first supervene, the fomentation should be persevered in till they are removed; and, at the same time, it will be of no small advantage for the patient to remain in the horizontal position. This simple application, made in proper time, may often prevent a most distressing disorder.

Obstructions.—In cases of suppression or irregularity of the menstrual discharge, which, from the irritable state of the system, is not unfrequently accompanied with hysteric affections, the most beneficial effects may be expected from warm bathing.

Swelling of the Extremities.—The warm bath, it seems probable, may be employed with considerable advantage in cases of swelling of the legs, which is the consequence of debility; and it has been recommended in all those cases where general debility exists, accompanied with cold extremities.

Croup.—In croup, which is so often fatal in the earlier periods of life, the warm

bath has been long recommended. But in a disease in which the termination is so often doubtful, if the severity of the symptoms be not speedily checked, topical bathing will be found far more efficient. In those who are supposed to be liable to this disease, the first approach of the symptoms, such as tickling cough, hoarseness, and difficult breathing, should be carefully watched, and the fomentation is to be steadily persevered in, till they seem to give way; and during the interval of discontinuing the fomentation, when the patient is fatigued and exhausted, rubbing the throat and breast with camphorated ointment will be found highly useful. But in this, as well as in all other cases where the continuance of the fomentation is of so much importance, care should be taken that the water be not so hot as to render the skin tender.

Inflammation of the Throat.—In slighter affections of the throat, when the internal surface is inflamed, and feels raw and sore, topical cold bathing, followed by friction with warm dry flannel, is often highly beneficial; but when the symptoms assume a

greater degree of severity, and when the glands are swelled and painful, the topical warm bath is the best and the most efficient remedy. In no case, indeed, are the effects of fomentation, when applied in time, and steadily persevered in, so certain and so remarkable. In both the kinds of sore throat now alluded to, the partial use of the vapour bath, by inhaling the steam of hot water in the way already directed, will be found to contribute materially to the diminution of the inflammatory symptoms.

Scrophula.—Cold bathing has been almost universally recommended in scrophulous affections, and it can scarcely be doubted that it must prove highly beneficial in giving that strength and vigour to the constitution which will enable it to resist their effects. But when the disease has actually supervened, and the swelling of the glands has made some progress, the greatest benefit may be expected from fomentation. In such cases, as when the glands about the throat or neck are swelled and indurated, the fomentation should be repeated at least three or four times in the course of the day;

and perhaps the use of the warm bath itself, on every alternate day, would tend greatly to promote a speedy cure.

Inflammation of the Eyes.—In the early stages of inflammation of the eyes, fomentation is often found extremely useful in relieving the pain, and removing the redness. For the same purpose, the vapour bath, which is applied by holding the eye affected over a vessel with hot water, is also very effectual in diminishing the severity of the symptoms. When the inflamed eye is very tender, a bit of thin linen or muslin may be placed upon it, before the application of the flannel cloths wrung out of the hot water.

Ear-ache.—In slighter cases of ear-ache, the pain and inflammatory symptoms are often removed by the topical vapour bath, or by holding the affected ear over a vessel nearly filled with water at the boiling temperature. But when this excruciating disorder has assumed a greater degree of severity, recourse must be had to the most active fomentation, and it must be continued without interruption till the pain abates. In some violent cases which have lately fallen under

my own observation, the effects of the fomentation seem to be greatly assisted by introducing into the ear a little cotton moistened with laudanum. The artificial heat probably converts the tincture into vapour, and in this state renders its action more efficient.

Tooth-ache.—Severe fits of the tooth-ache may be alleviated or removed by fomentation. The flannel cloths are to be applied to the affected jaw. When the pain is not confined to one tooth, but is diffused over the whole side of the head, the fomentation will be found very effectual.

Pectoral Complaints.—In all those complaints of the breast which come under the appellation of *colds*, and are attended with tickling cough, or exhibit pneumonic or pleuritic symptoms, and are accompanied with dull pain diffused over the chest, or with sharp pains or stitches confined to particular parts, the use of topical bathing will be found highly beneficial in mitigating the cough and relieving the pain. The inhaling of the steam of water at the same time, will prove a valuable accessory remedy in produ-

cing the same effects. The treatment now recommended, when early adopted, and steadily pursued, will often be the means of obviating a violent attack of a dangerous disorder, or at least of moderating the symptoms, and abridging the period of its course.

Cramp of the Stomach.—The severe disorder of cramp in the stomach, to which some persons are peculiarly liable, is very effectually relieved by fomentation vigorously applied. A few drops, three or four, of oil of peppermint, on a bit of white sugar, given at the same time, will be found to produce very salutary effects. Gouty patients are subject to similar attacks, usually designated *gout in the stomach;* and if not speedily relieved, such attacks have frequently a fatal termination. In such cases fomentation will prove a most efficient remedy.

Sprains.—Bleeding with leeches, and cold applications of vinegar, and solutions of sugar-of-lead, have been long held as specific remedies in sprains and bruises; but, in such cases, I have found from repeated experience, that no plan of treatment yet devised, is so speedy and powerful in relieving

the pain and swelling as fomentation. From the irritable state of the skin of the part which has sustained the injury, it is necessary to observe the precaution that the cloths be not applied too hot.

Suspended Animation.—In the use of the various means for the recovery of persons apparently drowned, and indeed in all cases of suspended animation, one of the great objects is the restoration of the natural heat of the body. Among the different methods that have been devised and recommended for this purpose, fomentation with cloths wrung out of hot water, has not, as far as I know, yet found a place, although it appears to be the most efficient that has been thought of or suggested. The most powerful and salutary effects are produced by this mode of communicating heat to the body in such cases. The fomentation is to be applied to the extremities, but especially to the trunk of the body, and to the region of the heart. But the excellent effects of this application will be best illustrated by briefly detailing a successful case of recovery

from apparent drowning which fell under my own treatment.

In summer 1819, a boy about six or seven years of age had gone out in a boat from Newhaven, near Edinburgh, along with some of his companions not much older than himself; and when about a mile distant from the shore, he fell into the water, and had floated a considerable distance from the boat before he was picked up. As no very distinct account could be obtained from the juvenile adventurers, either how long he was in the water, or what time was lost in reaching the shore, the length of time from his falling into the water till he was brought home could not be precisely ascertained. All agree that it could not be less than half an hour, and some fix a much longer period. Another half hour at least had elapsed when I heard of the accident. Every proper measure had been resorted to for the purpose of restoring the heat of the body, as warm cloths, bottles filled with warm water, &c. applied to the trunk and extremities; but still the diminution of heat was

very considerable, the eyes were fixed, and the eye-lids closed; the respiration and pulsation were at times scarcely perceptible; and he seemed to be altogether in a state of stupor. Besides the means already employed, and which were continued, I had recourse to friction all over the trunk of the body, but more particularly about the chest; and the crowd, collected by anxiety or curiosity, was dismissed from the apartment, which was sufficiently ventilated by opening a window distant from the bed. This treatment continued for more than two hours, and during which several injections of warm water had been administered, afforded little hopes of a return of animation. On the contrary, more than once or twice the respiration seemed entirely to cease; and being greatly exhausted with fatigue, I sat down as often in despair. Having the command of a greater quantity of hot water, the supply of which had been very scanty, I determined to try the effects of fomentation; and such was the influence of the heat communicated in this way, chiefly to the region of

the heart, that on the application of the second cloth wrung out of the hot water, the eyes opened; in a short time the motion of the limbs was restored; and in ten minutes from the first application, the boy was able to swallow a tea-spoonful of brandy diluted with water, and mixed with sugar. The recovery now seemed no longer doubtful; and I am fully persuaded, would have been effected much sooner if a sufficient supply of hot water could have been obtained.

In the course of the evening the breathing became laborious and somewhat stertorous, with flushing of the face, obviously arising from some pressure on the brain; a leech applied to the temple soon afforded relief; next day the child was confined to bed; but the day following he was quite recovered, and was able to amuse himself in his usual way out of doors.

In such cases, and indeed in all cases of suspended animation, as far as the vital functions can be restored by heat, fomentation, according to the method recommended, furnishes the most efficacious means.

When it can be done, the application should be made not only to the region of the heart and the stomach, but also to the extremities.

PART II.

DESCRIPTIVE NOTICES OF WATERING-PLACES IN DIFFERENT PARTS OF THE KINGDOM.

INTRODUCTION.

THE choice of a place for drinking mineral waters, or for sea-bathing, is, in the greater number of cases, regulated by local circumstances rather than by a consideration of the peculiar character of the mineral water, and its suitableness to the relief of particular complaints, or by attention to the prevailing climate, or favourable shelter of bathing quarters. In this choice, indeed, economy must often be the chief guide. But where the invalid has it in his power to make a selection, some useful rules might be given.

Those who are of a feeble or delicate con-

stitution, and are advised to employ sea-bathing, will do well not to approach the eastern shores of the kingdom, in the early part of the season, while the winds, sweeping across the German Ocean, reach the coasts of Britain, loaded with chilling vapours, which not only affect transient visitors, but make a serious impression on the health of the permanent inhabitants, by inducing colds, and various pectoral complaints. The neglect of this precaution, it cannot be doubted, has often frustrated the benefits of sea-bathing, and has been followed by injurious effects. Less occupied with the ordinary business of life, or perhaps for a time altogether disentangled from its concerns, persons at bathing-quarters are much out of doors, and are thus exposed to the piercing east winds, and involved in dense fogs, in a condition of body little prepared to resist their baleful influence; and thus, not only is the restoration of health retarded, but a new series of complaints is in some instances induced. Excepting in the southern parts of the kingdom, the east coast, and perhaps

some places on the west coast, should not be visited earlier than after the middle of June.

Some writers speak of preparation for the commencement of a course of sea-bathing, and for this purpose recommend certain medical treatment. These preliminary matters seem to be in most cases altogether unnecessary; and the vulgar error, that some days should elapse before bathing is begun, that the body may be habituated to the sea air, has no stable foundation whatever. By attention to the precautions already given in the former part of this Treatise, no person need fear the least injurious consequence, should he plunge into the sea the moment he reaches the coast; and to insure its beneficial effects, the best of all precautions can never be too much urged, of remaining not more than a minute in the water.

Peculiar circumstances also very frequently decide the preference given to a mineral water, although it is quite obvious that the climate, soil, and situation of a mineral spring, as well as the season of the year, should be kept in view by those who possess

the power of selection. In such cases, the advice, it is probable, of a medical practitioner will be followed. But perhaps even the general reader may derive some assistance, at least with a little chemical knowledge, from a short statement of the principal characters of mineral waters.

The peculiar properties of mineral waters are derived from certain soluble substances with which they combine as they filtrate through the soil, or pass through the fissures of the rocky strata of the earth. They have been divided into four classes, namely, acidulous or gaseous waters, saline waters, sulphureous waters, and chalybeate waters.

Acidulous waters are distinguished by a penetrating acid taste, sparkle when they are poured into a glass, give out bubbles of air when they are agitated, and boil with facility, in consequence of the escape of the carbonic acid with which they are generally impregnated. When lime-water is added to such waters, a precipitate is formed by the union of the lime and carbonic acid, and the formation of insoluble matter. Waters of this description redden the tincture of turn-

sole, and when they are strongly impregnated with the acid, convert other blue vegetable infusions to a red colour.

Saline waters are sufficiently characterized by the taste, which, as might naturally be expected, varies according to the nature of the salt held in solution. Common salt or muriate of soda, is met with in almost every kind of spring water; and even in such waters as are accounted tolerably pure, muriate of lime is common, and muriate of magnesia, as well as Epsom salt or sulphate of magnesia, is a frequent ingredient in mineral waters. Some of the alkalies, and lime combined with carbonic acid, are not unusual in most waters.

Sulphureous waters have a peculiar fetid odour, which resembles that of the washings of a gun, or of rotten eggs. The blackening of lead and silver is another test of these waters. In some of them the sulphuretted hydrogen gas, to which they owe their distinguishing character, is held in solution by the water, and in others it is combined with lime, or with an alkali. In the first case, the elastic fluid escapes entirely from the water,

by exposure to the air, or by boiling, and leaves it in a state of purity, so that it is fit for all ordinary domestic purposes; and in the last case, a white precipitate of lime combined with carbonic acid, is formed. But some sulphureous waters hold also in solution a portion of saline ingredients, which continues in permanent combination.

Chalybeate waters, constituting the fourth class, are characterized by an astringent taste, and produce a black colour, with the addition of an infusion of galls, and a blue colour with the prussiate of potash. These changes are owing to iron, which is held in solution either by carbonic or sulphuric acid; and when the carbonic acid happens to be in excess, the water has a penetrating taste, and a slight degree of acidity. By boiling, water of this description usually deposits a brownish or reddish sediment.

It would be difficult to lay down precise rules for the use of mineral waters, where so many circumstances must be taken into consideration. But it may be observed in general, that the saline class of waters will be found highly useful where mild laxatives

are required; and where it is necessary to restore the tone of the stomach and digestive organs, and to renew the diminished vigour of the system, some of the other three classes may be administered with advantage.

It may be worth while to notice a very erroneous, and, I suspect, not uncommon practice, in the use of mineral waters. The practice alluded to, of swallowing too great a quantity of the water, especially at the commencement of the course, probably has its origin in the natural anxiety to obtain immediate relief, and a speedy cure. But as sudden changes of any kind have a considerable effect on the animal frame, how can it be supposed that a large quantity of a mineral water taken into the stomach, in a state of debility, and which has, perhaps, never been accustomed to water of any kind, shall not prove prejudicial? And indeed it can scarcely be doubted, that to this cause is to be ascribed the failure and disappointment which many have experienced, and which might have been fully obviated by beginning the course with small quantities.

The following brief notices will be chiefly confined to the general character of the watering place, the more prominent features of the surrounding scenery, and the nature and properties of the mineral water.

PETERHEAD.

Peterhead, which is the most northerly watering place of the kingdom, occupies a peninsular spot near the eastern extremity of the coast of Scotland; and combining the advantage of a mineral spring with sea bathing, has, of late years, risen to just celebrity, and has attracted, during the summer and autumn, crowds of visitors, chiefly from the towns of the northern districts. The distance of Peterhead from Aberdeen is 33 miles, and from Edinburgh 139 miles; so that its remote situation from the central and southern parts of Scotland precludes their inhabitants from enjoying the two-fold benefit which it holds out to the invalid.

Like other places on the eastern coasts, Peterhead must be exposed to the cold winds

and thick fogs from the German ocean during the spring and early summer months; but enjoying a dry soil, it affords comfortable walks and rides, and the busy scenes of a sea-port town present an agreeable variety of amusement to the stranger.

The best accommodations are provided for those who visit Peterhead, both in private houses and in the public establishments, which are elegantly fitted up and well furnished; a public table is kept up; and the amusement of the company is not neglected in the assemblies or balls held every fortnight.

Commodious apartments have been constructed for cold and warm bathing; so that those who do not choose, or to whom it may not be convenient to bathe in the open sea, are not deprived of that benefit.

The mineral spring on the south side of the town has obtained the appellation of the wine well, because the water poured into a glass sparkles like Champagne. It may be considered as a combination of an acidulous and chalybeate water, for it contains a large proportion of carbonic acid in a free state;

and beside the iron which is combined with carbonic acid, it is impregnated with a portion of common salt, and with some of the salts of lime.

The water has been long in high repute, in cases of general debility, in disorders of the stomach, and in nervous and scrophulous affections; and when administered with the precautions already alluded to, it cannot be doubted that it will retain all its former celebrity.

PITKAITHLY.

To those who admire rural scenery, and picturesque beauty, the situation of Pitkaithly holds out many attractions. The valley in which the spring rises, is watered by the river Earne, which has obtained some classic celebrity in Scottish song, and confers the name Strathearne on the district. The springs, of which several have been discovered, are at a short distance from the great road leading from Edinburgh to Perth, and within three miles of the latter

city. The banks of the river are richly wooded, and afford comfortable shelter to the walks and rides of visitors; while those who are able and disposed to extend their excursions to the higher grounds in the vicinity, may command the romantic and varied prospect of the mountains of the Highlands rearing their rugged and lofty summits to the clouds, and the Tay, one of the noblest rivers of the kingdom, issuing from their distant recesses, and rolling its mighty current to the ocean.

Transient visitors to Pitkaithly find good accommodation at the inn, where a public table is kept; and those who make it a more permanent residence, and are desirous of more retirement, can provide themselves with private lodgings in the neighbouring villages.

The water of Pitkaithly belongs to the saline class of mineral waters. It is composed chiefly of muriate of soda, or common salt and muriate of lime, and with a slight trace of sulphate and of carbonate of lime. The whole amount of saline ingredients in an English pint of the water is about thirty-

five grains. But the different springs are found to vary in strength.

The sensible effects of this water on the animal economy are diuretic and laxative; and in many cases it has proved extremely efficacious in restoring the diminished tone and vigour of the stomach and digestive organs. The quantity of water to be taken must vary according to the nature of the complaint, so that no precise rule can be given; but it must always be advisable to begin with small portions.

DUNBLANE.

THE mineral spring of Dunblane, which is about two miles distant from the village, was discovered in 1814, in consequence of flocks of pigeons frequenting the small pools formed by the water as it issued from the earth. Pigeons, it would appear, are fond of water thus impregnated with saline matter; for the discovery of a similar spring in the vicinity of Paisley was made in the same way.

Dunblane is six miles distant from Stirling, to which a daily conveyance by canal and steam-boats is now established from Edinburgh, Glasgow, and the more populous districts of Scotland. It is situated on the banks of the Allan, a stream also commemorated in Scottish song, and affording, by the liberality of the proprietors in the neighbourhood, the finest and most romantic walks along its richly-wooded banks. The antiquary will find some occupation in tracing the history of the Cathedral, presenting, in its venerable ruins, a sad memorial of the ravages of time, and of the more dreadful ravages of fanatical zeal. Doune Castle, an ancient baronial residence now in ruins, at the distance of a few miles, on the banks of the river Teath, will also furnish some historic recollections of considerable interest. The district in which Dunblane is situated is well sheltered by the surrounding mountains; the soil is dry, and the climate mild.

The water issues from two springs, the more northerly of which is most strongly im-

pregnated with saline matter, which amounts nearly to forty-six grains in an English pint. The ingredients, which are nearly the same as the waters at Pitkaithly, but in larger proportion, are the following: Muriate of soda, or common salt, twenty-four grains; muriate of lime, eighteen grains; sulphate of lime, three and a half grains; and carbonate of lime, half a grain, with a slight indication of iron.

The mineral water of Dunblane, from similarity of composition, may be recommended for the same complaints as the Pitkaithly water; and, as has been already noticed, the effects are not to be estimated according to the strength or quantity of the saline ingredients; for it appears from the experience of medical practitioners that the efficacy of diluted solutions, or of small doses of medicines, although less violent, is not less permanent than when they are more liberally administered. This water will be found highly useful in cases of general debility, and particularly in stomach complaints, and it seems likely to be beneficial in scrophulous affections; but in disorders of the lat-

ter description, it will be requisite to persevere long in its use.—Murray, *Edinburgh Transactions*, VII.

EDINBURGH.

THE metropolis of Scotland is well situated for affording the advantages of sea-bathing to the inhabitants; within itself it contains cold and warm baths, commodiously fitted up at the Royal Infirmary, at the Royal Hotel, Prince's-street, and at the Waterloo Hotel; and a private establishment of the same description, with the addition of vapour and medicated baths, in Drummond-street; and it can boast of sulphureous and chalybeate springs almost in its immediate vicinity.

Portobello, which was little else than a barren waste of sand, even in the memory of persons yet living, is now an extensive town, and has become the great resort of the inhabitants of Edinburgh, for sea-bathing. The dry soil is always agreeable for walking; the sea-beach is smooth and fine;

and the air is pure and salubrious. Baths for cold and warm sea-water have been constructed in an elegant and commodious manner; and a similar bathing establishment has been formed at Sea-field, nearer Leith.

The inhabitants of Edinburgh visit also Musselburgh, Prestonpans, and other towns and villages to the eastward, for sea-bathing; and, perhaps, the distance, and the want of travelling accommodation, preclude North Berwick from being crowded with visitors, which the coast and scenery would draw to its shores.

The water of St Bernard's Well, the spring of which, on the banks of the Water of Leith, is within a few minutes walk of some parts of the New Town, is impregnated with sulphuretted hydrogen gas, and contains scarcely any other ingredient; for, when it is boiled, or even exposed to the air for a few hours, it becomes quite pure without the deposition of any sediment, as sometimes happens with mineral waters of this class. The water of St Bernard's Well, although not of great strength when compared with those of Moffat and Harrogate, of

the same nature, will be found useful in all those cases in which sulphureous waters are usually recommended ; and, in restoring the tone and vigour of the organs of digestion, after occasional excess, it will prove peculiarly beneficial.

The chalybeate spring, near the bridge of Bonnington, discovered within these few years past, indicates by its taste the class of mineral waters to which it belongs ; but although it has not been sufficiently examined to ascertain precisely the nature and proportions of the saline ingredients in its composition, it may be safely recommended as a useful tonic remedy.

CANDREN WELL, NEAR PAISLEY.

As this mineral water has not been noticed in any publication, excepting in a small treatise on its chemical properties, and its medicinal effects, by Dr Lyall, which was circulated privately, it may be worth while to introduce a short account of it, as the saline

ingredients with which it is impregnated seem to entitle it to attention.

The discovery of this spring, like the mineral water at Dunblane, is ascribed to pigeons which were seen to collect daily, in great numbers, in the furrows of the ridges, and the holes of the field, where it oozed from the earth: after long continued drought, depositions of saline matter were seen on the places from which the water had evaporated; and a workman, swallowing a copious draught of the water, was much struck when he perceived its strong saline taste. Some of the water was carried to Paisley, with this information, and, being examined by some of the medical practitioners, Dr Rodman pronounced it to be of the same nature as the Pitkaithly water, but stronger in quality. Like the waters of Pitkaithly and Dunblane, it rises from the fissures of a sandstone rock, and a well is dug to the depth of ten feet.

The situation of this spring, in a flat tract of country, about two miles to the westward of Paisley, is, perhaps, not sufficiently attractive of itself, to encourage vi-

sitors to a temporary residence on the spot, even if proper accommodations were provided, so that those who come from a distance, for the use of the water, must take up their abode in Paisley, or in some of the neighbouring villages.

The experiments of Dr Lyall, already alluded to, seem to have been conducted with much care; but it would be necessary to have them varied and repeated, before the saline contents of this water can be considered as fully ascertained. From a wine gallon of the water evaporated to dryness, 220 grains of solid matter were obtained. This matter readily deliquesced when exposed to the air. The following are the proportions of the ingredients determined by this analysis:—Muriate of soda, or common salt, 110 grains; muriate of lime, 40 grains; sulphate of magnesia, or Epsom salt, 30 grains; muriate of magnesia, 27 grains; carbonate of lime, eight grains; sulphate of lime, five grains.

But, as it is stated that the crystals obtained by evaporation are mostly of a cubical form, it may be suspected that the

quantity of common salt ought to be increased, and magnesian salts diminished; and should this conjecture be verified by repeating the analysis, the composition of the Candren Mineral Spring will approach more nearly to the Pitkaithly and Dunblane waters.

The effects of this water on the animal economy are similar to those of Dunblane and Pitkaithly, and are found to be diuretic or purgative, and, in some constitutions, it seems to have a tendency to promote perspiration. To derive the greatest benefit from drinking this water, it seems probable that it should be taken in small quantities, frequently repeated. But the enormous dose of two or three quarts, which, it is said, has been sometimes swallowed, can scarcely fail to be injurious to the most vigorous constitution.

This water has been found peculiarly beneficial in constitutions relaxed by sedentary habits, or intemperance. It has been recommended in scrophulous affections, and, indeed, has been found useful, when persevered in for a sufficient length of time, in

such disorders. This water may be also beneficially employed in bathing ill-conditioned sores, or in washing the eyes in cases of inflammation; but when applied to these purposes, it should be used moderately warm. For removing eruptions of the skin, it may be taken internally, and used externally for bathing the part affected. Taken in moderate quantities, it will be found useful in cases of indigestion, or in such affections of the organs of digestion as come under the common appellation of stomach, or bilious complaints.

A sulphureous water rises from a spring called the Seedhill, on the banks of the Cart, in the immediate vicinity of the town of Paisley. It is similar in its properties to the water of St Bernard's Well, near Edinburgh, but seems to contain a larger proportion of common salt; and yet, when it is boiled, it is sufficiently pure for all domestic purposes. Of its beneficial effects in debility of the stomach, whether from relaxation, induced by a sedentary life, or occasional excesses, the most ample evidence might be adduced.

FIRTH OF CLYDE.

THE shores of the Firth of Clyde are the usual resort of the inhabitants of the western districts of Scotland, for sea-bathing; and in this preference the local position probably has not more influence than the excellent accommodation, salubrious air, and picturesque scenery, which contribute so essentially to the enjoyment of a temporary retreat from the cares and business of the crowded city; and to almost all the places now alluded to, the speedy and cheap conveyance of steam-boats holds out no small advantage.

Helensburgh, in Dumbartonshire, is seated at the mouth of the Gare Loch, an arm of the sea which advances many miles into the country, is within an hour's sail of Greenock, on the opposite shore, and has risen, of late years, to great celebrity as a watering-place. Besides the convenience of bathing in the open sea, for which Helensburgh presents every facility, cold and warm salt-water baths have been constructed, for those

who do not wish to be exposed to the open air. The dry soil, and romantic views, afford to strangers, not only in the immediate vicinity, but in more distant excursions along the banks of the loch, the most delightful walks and rides; while to the observant eye, the bold and rugged features of the Highland mountains are strikingly contrasted with rich fields in the finest state of cultivation, and elegant mansions embosomed in extensive woods.

Gourock, within two miles of Greenock, has been long much resorted to for sea-bathing; and it holds out some advantages to those who wish to be less retired, or who are desirous of amusing themselves with an occasional glimpse of the bustle and activity that prevail in that celebrated sea-port town.

Auldkirk is five miles to the westward of Gourock; as a place for sea-bathing, possesses all the conveniencies of the latter; is in a more retired situation, and as the firth opens, enjoys a more extensive and varied sea prospect. The dry and sheltered walks,

as well as the fine woodland scenery, will serve also to recommend it as a watering-place.

Largs, about seven miles farther to the westward, on the same coast, is a thriving town, in a fine dry soil; commands a still more extensive sea view, in which are included the islands of Cumbray, Bute, and the distant mountains of Arran; has been long a fashionable resort for sea-bathing; and now enjoys the advantage of cold and warm salt-water baths, and a subscription reading-room. Conveying the labours of ingenuity and art to distant countries, or loaded in return with the rich productions of nature, from almost every quarter of the globe, the ships daily passing to and fro give a peculiar interest to the beauties of this scene. Largs is memorable for the total defeat of the Norwegians, who, with a great body of troops, under their king Haco, invaded Scotland in the thirteenth century. The narrative of this decisive battle, which was fought in 1263, holds a conspicuous place in the early history of the kingdom,

and much is still recounted of its progress and glorious issue to the brave defenders of their country, in local tradition.

As this coast was open to the attacks of hostile invaders, numerous strongholds were constructed for its defence. The remains of many of these forts and baronial castles being still visible, furnish to the antiquary copious subjects of investigation. Port-in-cross, a few miles along the shore, was a royal residence; and from this place the devotees from the southern districts of Scotland embarked on their pilgrimage to Iona, to perform their vows at the holy shrine of St Columba.

An event that occurred in a later period of our history renders this place not less memorable. One of the ships of the formidable Spanish Armada, which was sent out in 1588 by Philip, for the conquest of England, and soon after its appearance in the British seas was dispersed by a storm, was sunk opposite to Port-in-cross. The descendants of the Spaniards, it is alleged, may still be traced among the inhabitants of the neighbouring parishes; and in an at-

tempt to examine the wreck, which was made about the year 1750, several guns of brass and iron were brought up. One of these guns, which was of iron, lay long on the beach, and being deeply corroded, presented the appearance of a honey-comb; and another was transported to Greenock, and set up on the street, for the ignoble purpose of protecting the corner of a pavement from the wheels of carriages.

Ardrossan.—Under the spirited exertions of the late Earl of Eglinton, a commodious harbour has been formed, and a new town has risen, near the old castle of Ardrossan, formerly a residence of that family. This castle was dilapidated in the time of Cromwell's protectorate, and the materials were conveyed to Ayr, for the construction of the fortification, great part of which still remains.

No part of the coast is more favourable, or more convenient for sea-bathing, than Ardrossan; but in the hotels and private lodging houses, and in the cold and warm salt-water baths, no accommodation is wanting to render it an attractive watering-place;

and accordingly it is visited by families of the first rank and distinction.

Troon, which is about half way between Irvine and Ayr, is, like Ardrossan, a new place, and is indebted for its origin and progress to the fostering care of the present Duke of Portland. The shores in the vicinity afford every convenience for sea-bathing.

Ayr, which is situated on a fine dry soil, offers numerous historical recollections, both of ancient and modern date. It was the scene of many of the daring exploits of the renowned Wallace, for the deliverance of his country from a foreign yoke, and of whom much is preserved in legendary tradition; it was selected by Cromwell as a station for his troops, and converted into a stronghold in the way already alluded to, for the purpose of maintaining his authority in the country; and to the admirer of Burns, every spot consecrated by his muse, and commemorated by the powers of his genius, will excite the most pleasing emotions, and add a double relish to the descriptive delineations and impressive moral lessons of

our native bard, when they are read and studied on the spot which gave them birth. The Ayr, almost throughout its whole course, and its romantic banks, are depicted in his most glowing strains; the Doon is the subject of some of his sweetest effusions; and in the inimitable tale of Tam o' Shanter, the whole legendary lore of the district is artfully embodied.

The dry soil in the vicinity of Ayr affords comfortable walks; and a long extent of a fine sandy beach renders sea-bathing convenient and agreeable. But with the sea-bathing, a mineral spring in the immediate vicinity of the town holds out another advantage to those who resort to this place. The water of this spring, which has its source in the coal strata, is of a chalybeate nature; and although it has acquired no reputation beyond the limits of the neighbourhood, it may be successfully employed in all those cases for which similar waters are recommended.

The village of Priestwick, three miles north from Ayr, merits notice, as a retired spot in a sandy soil; and having a fine sea-

beach, it has become of late years a place of considerable resort.

MOFFAT.

THE village of Moffat, which is about fifty-six miles south-west from Edinburgh, occupies a finely sheltered spot at the head of a valley on the banks of the Annan, and is surrounded by hills, some of which are of considerable elevation. The principal street is spacious and airy, and the inns and lodging houses are neat and commodious; while the surrounding scenery, and salubrious air, render it a delightful summer retirement for invalids.

Moffat has been long celebrated for its mineral springs. The waters are of two kinds, sulphureous and chalybeate; the first of which is about a mile and a half distant from the village, and the last rises from a spring five miles distant.

The sulphureous water flows from a spring on the banks of the small river which gives name to the village. The spring is suffi-

ciently copious; and when the water is first drawn, it exhibits somewhat of a milkish or bluish appearance; the smell is like that of Harrogate, or St Bernard's, near Edinburgh, the taste is saline, and it sparkles a little when poured into a glass. Exposed to the air, the water becomes more turbid, throws up a thin film of sulphur, and is then deprived of its most characteristic property. Even in close vessels it undergoes this change, so that it cannot be conveyed to a great distance, without the loss of one of its most valuable ingredients.

The whole amount of foreign matter obtained from a wine gallon of Moffat water, is equal to thirty-six grains of muriate of soda or common salt, and nineteen cubic inches of elastic fluids, of which ten cubic inches appear to be sulphuretted hydrogen gas, five inches are carbonic acid gas or fixed air, and the remainder is azotic gas. From this result the composition of this water is very simple.

The sensible effects of this water on the animal economy are chiefly diuretic, and more rarely laxative. In cutaneous erup-

tions, the use of this sulphureous water has been peculiarly successful, and hence has been regarded as a specific remedy in such disorders. The external application of the water, made pretty warm, to the parts affected, is found very beneficial. Great benefit is also obtained from the use of the water, as a constant dressing, to ill-conditioned or irritable ulcers. In the earlier stages of scrophulous affections, its good effects are most conspicuous; for, by persevering in its use, the swelling of the glands is often removed without suppuration. In stomach or bilious complaints it may be had recourse to as a safe and efficient remedy.

Near the village of Moffat a weak chalybeate spring has been discovered; but the Hartfell Spa has its source at the base of a high mountain of the same name, and at the distance of five miles; so that the water can seldom be conveniently used as it issues from the spring. It is therefore conveyed to the town in close vessels; and although it deposits a portion of iron, even when excluded from the air, yet, retaining a large portion of the metallic ingredient,

on which its medicinal property depends, it may be kept for some time without much diminution of its effects.

When drawn from the fountain, the Hartfell water is perfectly clear. By boiling and slow evaporation, not more than five cubic inches of an elastic fluid escapes from a wine gallon; and as iron is at the same time precipitated, the gaseous substance is probably carbonic acid. The solid contents are sulphate of iron, 84 grains; sulphate of alumina, 12 grains; and oxide of iron, 15 grains.

In some cases the first effects of the Hartfell Spa water, when taken in too great quantity, are giddiness and sickness, and frequently it produces constipation of the bowels. It has proved highly beneficial in general debility; and while it is employed internally as a medicine, its external application to old inveterate sores has been attended with the most salutary effects. The invalid should begin the use of this water with small doses; and it may render it more agreeable to a delicate stomach to drink it in a slightly tepid state.

WINDGATE SPA.

THE Windgate Spa is near a village of the same name, and is eight miles from Morpeth, and four miles from Rothbury, in the county of Northumberland. It is situated on the joint property of Mr Trevelyan of Netherwitton, and Mr Witham. The spring issues from strata of coal and limestone, both of which are wrought in the immediate vicinity. The temperature of the spring was 47°, when the thermometer stood at 45° in the air; the water is perfectly transparent when it issues from the spring; but as it flows along, it deposits an ochery sediment. It sparkles when poured into a glass, has a strong astringent taste, and with the usual tests, indicates that it holds in solution sulphate of iron, an aluminous salt, and a salt of lime. By boiling, a portion of carbonic acid is separated, and oxide of iron is precipitated; and when slowly evaporated, the solid contents obtained from a pint of the water amounted to thirty grains, of which six grains were found to be sulphate of iron,

fifteen grains sulphate of alumina, and nine grains ochery matter, or oxide of iron. But as this analysis was made nearly thirty years ago, it can scarcely be considered very correct. Some other earthy salts are clearly indicated by the preliminary tests.

In all cases of general debility, the Windgate Spa has been found extremely beneficial; it is not less efficacious in those cutaneous eruptions which come under the denomination of scorbutic; and in scrophulous affections the use of this water has been very successful. As an external application in inflammation of the eyes, and in restoring to old and ill-conditioned sores a disposition to heal, it has been attended with equal advantage. The parts affected are bathed with the water two or three times a-day, and at the same time, its internal use in moderate quantities is to be continued.

HARROGATE.

HARROGATE has been long celebrated for mineral waters. Two villages of this name are distinguished by the names of High and Low, and occupy an agreeable situation in a central district of Yorkshire. The distance of Harrogate from the city of York is twenty miles, from Leeds sixteen miles, and from London 211 miles. The country around is adorned with many elegant mansions, and the ancient forest of Knaresborough, which is now enclosed and cultivated, with the town of the same name, on a beautiful and romantic spot, forms part of the scenery, which cannot fail to strike the eye of the contemplative observer.

Four sulphureous springs have been discovered at Harrogate, all of which have their origin in an extensive bog, in which a mass of half fluid, black fœtid matter, chiefly composed of decayed vegetables, and in many places, four or five feet in thickness, rests on a bed of clay and gravel. When taken from the wells, the water is perfectly transparent.

Of the four sulphureous springs, one is found to be much more strongly impregnated with the sulphuretted hydrogen gas, and is only used for drinking, while the other three are devoted to the supply of the baths. But their general properties are nearly the same.

The water of the old Sulphur well, as it is called, is supplied by a copious spring, and is received in a large stone basin, which is covered with a dome, supported by pillars. Like the other springs, the water is quite clear; and when taken up, gives out a few bubbles of air. The smell is fœtid like the washings of a gun, and the taste, saline, bitter, and nauseous. When the water is exposed for some hours to the air, it is deprived of its transparency and part of its odour, acquires a greenish hue, and deposits a thin film of sulphur on the bottom and sides of the vessel. The temperature of the spring is 54° of Fahrenheit.

The sulphureous water of Harrogate, when bottled at the spring, and completely excluded from the air, may be kept for many months unchanged.

The gaseous contents of a wine gallon of

the water of the sulphur well, according to one analysis, amount to thirty-four cubic inches, of which nineteen inches are sulphuretted hydrogen gas, eight inches are carbonic acid gas, and seven inches are azotic gas; and the solid contents of the same quantity of water, amounting to 754 grains, consist of muriate of soda, sixteen grains; muriate of magnesia, ninety-one grains; muriate of lime, 13 grains; carbonate of lime, 18 grains, with a portion of carbonate and sulphate of magnesia. But according to another analysis, the quantity of elastic fluids is only equal to twenty-nine cubic inches; and besides the three gaseous substances already noticed, a portion of carburetted hydrogen gas was detected; and the solid contents, consisting of muriate of soda, muriate of lime, muriate of magnesia, sulphate of soda, and carbonate of soda, amount to 848 grains, of which 730 grains are muriate of soda, or common salt.

The parade of preparation for drinking the sulphureous water of Harrogate, so formally held out by some authors, is, in few cases, worthy of regard; and the only pre-

caution to be observed, is to begin the course with small portions; for in some cases, perhaps, when taken in excessive quantity, it has produced head-ache, or giddiness. Like other saline waters, it is beneficially employed in disorders of the stomach, and in the derangements of the biliary secretions which so often accompany diseases of the organs of digestion. The use of this water is also recommended in cases of general debility, in scrophulous affections, and in different visceral obstructions. But the sulphureous water of Harrogate has been found peculiarly useful in diseases of the skin, and from the numerous cures of this description which have been effected, has acquired its highest celebrity. In these cutaneous disorders, the use of the water was formerly limited to external application, and then its efficacy was sufficiently obvious; but it is now employed with the best effects as an internal medicine. In some old and inveterate eruptions, moderate doses of the water, slightly heated, contribute to keep up the perspiration which is induced by the warm sulphureous bath, and in this way restore the healthy action of the skin.

The waters of the other sulphureous springs are employed for bathing, and accommodations are provided for this purpose. The same precautions that have been suggested for the use of the warm bath in general, are to be observed in the use of the bath with sulphureous water. When it is required to excite perspiration, the bath is employed a short time before going to bed, and the perspiration may be kept up by means of warm diluent drinks.

Several chalybeate springs have been also discovered in the vicinity of Harrogate, but the quantity of iron with which they are impregnated is very small. The saline ingredients are similar to those of the sulphureous water, but in smaller proportion. The observations which have been already made, with regard to the use of chalybeate waters, apply equally to the chalybeate water of Harrogate. It has been suggested, that some advantage might be obtained by conjoining the use of the sulphureous and chalybeate waters; and it is recommended to the visitor at Harrogate, to take the water of the old

Sulphur Well in the morning before breakfast, and the saline chalybeate about midday. It may be worth while, perhaps, to try this plan; but its beneficial effects can only be ascertained by experience.

SCARBOROUGH.

SCARBOROUGH is a sea-port town in the North Riding of Yorkshire, and is forty miles north from Hull, and 218 miles from London. It is situated at the bottom of a lofty cliff, which overlooks a spacious bay, and is surrounded by precipitous rocks.

Scarborough combines the advantage of sea-bathing with its mineral chalybeate. Two mineral springs have been discovered issuing from the bottom of a high cliff, about a quarter of a mile distant from the town. Both of these springs are of a chalybeate nature, and although the source of both is near the same spot, yet the difference in their composition is considerable. The one is a simple chalybeate, containing a small proportion of iron, held in solution by

means of carbonic acid, without the admixture of any saline ingredient. But the other, which is distinguished by the name of Scarborough Spa, contains, beside the iron, a certain proportion of alkaline, or earthy salts, and perhaps of both; for the taste of this water at the spring is not only strongly chalybeate, but brisk and pungent, and at the same time saline and bitter.

The water of the Scarborough Spa contains a considerable proportion of carbonic acid, which escapes not only when it is exposed to the air, but even when it is kept in close vessels, and then it is deprived of its chalybeate property, by the deposition of the iron. This water is also described as of a hard quality, for it curdles soap, thus affording an indication of an earthy salt. The saline taste probably arises from common salt, and the bitter taste is to be ascribed to sulphate or muriate of magnesia. But this water has not been subjected to any accurate analysis of late years. From a pint of the water about thirty or thirty-five grains of solid contents are obtained, two-thirds of

which are found to be a soluble and crystallizable salt.

The general effects of the Scarborough Spa, are gently laxative and slightly diuretic; and although these effects are in some cases scarcely perceptible, it is not to be inferred that the use of this water, when persevered in, is not followed with any benefit, especially when it is accompanied with sea-bathing.

HOLY WELL.

Holy Well, a village or town of Flintshire, in North Wales, it can scarcely be doubted, derives its name and origin from the celebrated spring called St Winifred's Well, and on account of the virtue of the water, was much frequented in former times by crowds of visitors from the neighbouring counties. This water seems to have been in great reputation in the fourteenth century, for the Countess of Derby, the mother of Henry VII., erected an elegant Gothic chapel over the fountain. This copious

spring issues with great force from a limestone rock at the foot of a mountain, and forms a stream of such magnitude as to turn eleven large water-wheels within the short distance of a mile.

The water of this celebrated spring is remarkably transparent, and it is employed by the inhabitants for all domestic purposes, thus affording a pretty obvious proof that it is not strongly impregnated with mineral ingredients. It is said, indeed, that it resembles very nearly the Malvern water both in the nature and quantity of the substances with which it is impregnated; the whole amount of earthy and alkaline salts little exceeding seven grains in a gallon, so that its medicinal effects may be expected to be the same.

MATLOCK.

MATLOCK is a village in the hilly part of Derbyshire, and has been long admired for its picturesque scenery. It is seventeen miles distant from Derby, and 143 miles

from London. The springs, which first attracted notice about the end of the 17th century, rise from a lime-stone rock near the river Derwent, and they possess the property of a petrifying water; for it forms a calcareous covering on vegetables and other objects with which it comes in contact. The temperature of some of these springs is higher than the natural temperature of the ordinary springs at that elevation, and hence they come under the appellation of tepid or thermal waters. The source of the tepid waters, the temperature of which is about 68°, is from 50 to 80 feet above the level of the Derwent.

The water of Matlock is perfectly clear, curdles soap in consequence of the earthy matter, and contains a small portion of common salt, but has no sensible saline taste, so that its medicinal effects cannot be expected to be greater than those of pure water. But on account of the temperature of the water, it is advantageously employed as a tepid bath. Several of these baths have been constructed about 22 feet in length, and 15 feet in width; and one of still great-

er magnitude, is 30 feet long and 18 feet wide. The rules and precautions already detailed, with regard to the use of the cold bath, are here equally applicable.

BUXTON.

BUXTON is situated on the north-western side of Derbyshire, and not far distant from the borders of Cheshire. It stands in a narrow valley, which is surrounded on all sides by lofty hills. This elevated district, which is called the Peak-hundred, presents a bleak and barren aspect, excepting in the valleys, which are fertile and beautiful. The spacious caverns, which have been formed in the lime-stone, which is the prevailing rock of the country, have been long the admiration of travellers, and are emphatically denominated the Wonders of the Peak.

The waters of Buxton have been long in great repute, although it cannot boast of a very genial climate, and even in summer, few days elapse without rain; but the dryness of the soil, and the inequality of the

ground, which permits the frequent showers to be rapidly carried off, allows visitors to take the advantage of being out of doors during the shortest interval of clear weather. In no place has the hand of industry and cultivation succeeded better than in the improvements which have been made on this village, in the excellence of the roads, and the beauty of the buildings, and particularly the magnificent Crescent which has arisen under the auspices of the noble proprietor, affording the most elegant accommodation to those who visit Buxton.

The water of St Anne's well, as it rises through the fissures of the rock, is at the temperature of 82°; but when it is collected in the basin, it falls to 77°; it is perfectly transparent, and has scarcely any perceptible taste different from common spring water. A wine gallon evaporated to dryness affords fifteen grains of solid contents, of which ten grains are carbonate of lime, and the remainder muriate of soda or common salt, and muriate of magnesia, but chiefly the first.

From the small proportion of saline in-

gredients with which this water is impregnated, its medicinal effects cannot be very powerful; and yet it is said that it produces in some patients headache and slight giddiness. These effects probably are to be ascribed to the quantity of the water swallowed, rather than to its quality; and particularly when it is drunk by those who have not been accustomed to take pure water of any kind into the stomach. No danger of such consequences need be apprehended if the course of drinking commence with small doses at proper intervals. Perhaps it may be a useful precaution to allow the temperature to be somewhat reduced before using the waters. But the formal preparation recommended by some authors seems to be altogether unnecessary. Buxton water has proved highly beneficial in the deranged state of the digestive organs occasioned by previous intemperance; and it is equally efficacious in similar disorders arising from gouty and rheumatic affections.

The baths of Buxton are on a splendid plan. Three baths, two of which are public, and one is private, are appropriated to

gentlemen; they are from twenty-five feet to twenty feet in length, and from six to eighteen feet in breadth. Two baths, a public and private one, are constructed for the use of ladies, and nearly on the same grand scale. Beside the baths now mentioned, a charity bath is reserved for the patients at the Infirmary; and the visitors at Buxton have the farther accommodation of marble baths for warm bathing, a vapour bath and a cold bath. The temperature of the water employed in the tepid baths varies from 82° to 81°, as they are supplied directly from the spring or from the reservoir; and the temperature of the cold bath is about 60°.

The tepid bath is below the temperature of the human body; a slight shock is felt on the first immersion, but it is immediately followed by an agreeable sensation over the whole body. These effects are peculiarly beneficial to persons of a delicate constitution, or of an irritable habit. The small degree of reaction excited by the difference of temperature is regarded as a salutary effort of the system to restore the vigour of parts

which have been weakened by disease; and hence the cases in which the Buxton bath has been found most useful, are those in which diminished action, and sometimes even some deficiency of sensation, have affected particular limbs, as the consequence of violent inflammation, or external injury. In the various forms of chronic rheumatism which succeed the acute species of that disease, and when the inflammation has been fixed in moving parts, the most essential relief has been derived from the Buxton bath. By perseverance in its use, the power and vigour of the parts affected have been so far restored as to allow the invalid to have recourse to sea-bathing, or the ordinary cold bath.

The most proper time for using the Buxton bath is before breakfast, excepting in those cases where delicacy of constitution forbids the invalid to leave his apartments at so early an hour. At the commencement of a course of bathing, it is very properly recommended, that the time of remaining in the bath should not exceed a minute or two; and it can scarcely be doubted, that the use

of gentle friction shall prove beneficial, especially in stiffness of the joints, or in the diminished power of muscular action of any of the limbs.

Those who visit Buxton have also the advantage of a weak chalybeate spring in its immediate vicinity; the alternate use of which, with the other water, might perhaps be followed, in many cases, with very salutary effects.

LEAMINGTON PRIORS.

LEAMINGTON is two miles to the eastward of the city of Warwick, and ninety miles from London. It derives its name from the Leam, a small rivulet which flows near it. The plain of Warwick, in which it is placed, is covered with the same red marl and gypsum that forms the repository of the salt mines of Cheshire; and in this bed are to be traced the saline ingredients with which the waters of Leamington Priors are impregnated.

To those who admire the beauties of na-

ture, or who delight to dwell on objects that recal the memory of past events, or sooth the mind with agreeable recollections, the vicinity of Leamington holds out numerous attractions, in the magnificent pile of Warwick Castle, in the picturesque scenery of Guy's Cliff, and in the mouldering remains of Kenilworth Castle, which the genius of a modern writer, in a romance of the same name, has raised from its ruins, and in his inimitable description has decorated with all the splendour of a former age; nor will it be a small gratification to reflect, that the birth-place of Shakspeare, at Stratford upon Avon, is at no great distance, and that an opportunity is offered of contemplating the spot where the ashes of the immortal bard repose.

The springs of Leamington were not unknown in the 16th century, although it was not till the close of the 18th century that they acquired much celebrity; since which time, the village, formerly an obscure hamlet, has assumed all the elegance and neatness of a modern town.

The waters of Leamington are obtained

from nine different springs, all of which are impregnated with the same saline ingredients; namely, muriates of soda, of lime, and of magnesia, and sulphate of soda; but varying in the proportions of these ingredients. The whole amount of the saline ingredients of the different springs varies from 27 grains to 110 grains in an English pint of water. The water of some of these springs is impregnated with sulphuretted hydrogen gas, and in all of them a slight trace of iron is detected. The saline water at the Royal pump-room contains 110 grains in the pint, but the saline contents of the sulphureous water at the same place, amount to only about 38 grains. A pint of the water from Lord Aylesford's spring yields about 78 grains; the same quantity from Mrs Smith's spring affords 76 grains; from Mr Robins's spring, about 100 grains; from Mr Wise's spring, 90 grains; and from the three urns at the Marble Bath pump-room, from 27 to 38 grains.

From the composition of these waters, they are to be considered as properly belonging to the saline class. They are deprived

entirely of their chalybeate property by exposure to the air, and by the same treatment the sulphuretted hydrogen gas escapes; so that if any benefit is to be expected from these waters, on account of their chalybeate or sulphureous property, they must be taken at the spring.

It may perhaps be considered of no small advantage to those who visit Leamington, to have it in their power to make a selection of mineral waters of so much difference in strength, and thus to give the preference to what shall appear most suitable to the particular case. It is scarcely necessary to mention, that of the stronger kinds a small quantity only should be taken at first; and it is equally unnecessary to add, that these waters may be expected to prove beneficial in all those diseases for which the use of such waters is commonly recommended, and has been already noticed.

The baths at Leamington are fitted up with the utmost neatness and elegance, and every accommodation that could be desired is provided for cold and warm bathing.

MALVERN.

THE village of Great Malvern, which is situated on the east side of the extensive and lofty range of hills from which it derives its name, is eight miles distant from the city of Worcester, and 120 miles from London. From the summit of this range, on one side, a diversified prospect of corn fields, orchards, and hop plantations, presents itself; and on the other side, the distant view is terminated by the mountains of Wales. The pure air and retired situation of Malvern, are no small recommendation as a watering-place.

The spring called St Anne's Well is at a short distance from the village of Great Malvern. The water is remarkably pure, and is altogether destitute of taste; and indeed this might be expected, from the small quantity of saline ingredients with which it is impregnated. According to one analysis, the amount of solid contents obtained from a gallon of this water, is about seven grains, consisting of carbonate of soda, sulphate of

soda, and a very small proportion of the muriates of lime and of magnesia; and according to another analysis, the whole amount of solid contents is about five grains and a half, composed chiefly of sulphate of soda, and muriate of lime, with some carbonate of lime.

The water of the Holy Well issues from a spring between the villages of Great and Little Malvern, and, in its chemical properties, approaches very nearly to the water of St Anne's Well.

From the small proportion of saline ingredients with which it is impregnated, it is scarcely to be expected that the water of Malvern should have any remarkable effect, either when applied externally, or when employed as an internal medicine; and yet, in both ways, the use of this water has been attended with considerable benefit. It was first brought into notice as an external application, and has been found efficacious in inveterate sores, which are the consequence of a scrophulous habit of body, by moderating the discharge, and promoting the healing process,—in that variety of inflamma-

tion of the eyes which is induced by the same disease,—and in cutaneous eruptions, where the skin is hot and dry, by relieving the irritation and itching. The sensible effects of the Malvern water, when used internally, are diuretic. In many cases it has been found useful in painful affections of the urinary organs; it moderates the violence of hectic fever, produced by irritating sores; and, with the aid of pure air, and gentle and regular exercise, improves the appetite, invigorates the spirits, and confirms the general health.

CHELTENHAM.

CHELTENHAM is a small town in Gloucestershire, which has acquired great celebrity on account of its mineral waters. The distance from London is ninety-four miles; from Bath and Bristol, forty-four miles; and from the city of Gloucester, nine miles. The surrounding districts, in the vale of Gloucester, are fertile, and well cultivated, embellished with fine villages and exten-

sive orchards, and watered by the Severn, winding its course along richly wooded banks. In the midst of this beautiful scenery, Cheltenham has risen up, and now offers to the invalid who seeks health, as well as to those who visit it for amusement, every accommodation and enjoyment that could be desired, in elegant hotels, and lodging-houses, in a theatre, and in assembly-rooms.

The Old Well, or original spa, which is at a short distance from the town, was discovered about one hundred years ago. The waters of this spring, of which several varieties are described, belong to the saline class. The amount of the ingredients of which they are composed varies from 67 to 83 grains, in an English pint of the water. In some of these varieties muriate of soda is in largest proportion; in others, sulphate of soda is the prevailing ingredient; and in all of them the proportion of muriate of lime, and muriate of magnesia is small. A very minute portion of iron is also detected.

Montpellier Spa, or Thompson's Wells, discovered about 1806, contain the same in-

gredients, and nearly the same amount and proportions. A slight impregnation of iron is also observed in this water, which is by no means entitled to the name of strong chalybeate saline water.

The waters of the Sherborne Spa have also the same character with regard to their saline ingredients; but the whole solid contents obtained from an English pint of the water described as sulphureous and chalybeate, is not quite nine grains. Another water called the magnesian water, affords scarcely six grains; but the water under the appellation of pure saline, contains more than 84 grains of saline matter, of which nearly 73 grains are common salt.

The high celebrity which the waters of Cheltenham have obtained seems to have suggested the preparation of the salts with which they are impregnated in a solid form, by evaporating the water of the springs; and to have led to the artificial imitation of these salts, not only on the spot, but in different parts of the kingdom. One of these imitations consists chiefly of crystals, of sulphate of soda, or glauber salt, and is called

real Cheltenham salt; the same salt, being deprived of its water of crystallization, or in the state of efflorescence, is in the form of fine powder; and a third kind is called magnesian salts, from having a portion of sulphate of magnesia added to the glauber salt.

Cheltenham has been long resorted to by those who have lived in Tropical regions, and in whom a general state of relaxation, and impaired action of the digestive organs prevail. In an irritable state of the stomach, it is obvious, that a small quantity of the water should be taken at first, and gradually increased, till it produce a laxative effect. In a disordered state of the liver, when the diminished secretion of bile induces a costive habit of body, the use of these waters, when properly regulated, is found highly beneficial. In irritable and feverish habits, accompanied with thirst, and general languor, which seem to be the consequence of some local and visceral affection, less advantage is to be expected from the waters of Cheltenham; but in cases of jaundice, when fullness, distention, and a

sense of heat prevail, their good effects are considerable. The saline waters of Cheltenham have also proved efficacious in various diseases of the skin, particularly in erysipelatous affections.

Two chalybeate springs have been discovered at Cheltenham, containing, besides the impregnation of iron, a portion of alkaline and earthy salts; but, although none of these springs possesses any great strength, it has been properly suggested, that the invalid, after the use of the saline water, may have recourse to the chalybeate, on account of its tonic effect, with considerable advantage.

Those who visit Cheltenham are provided with most elegant accommodation for enjoying every kind of warm and cold bathing.

BATH.

BATH, which, in its modern state, is dignified with the appellation of The Pride of England, and The Admiration of Foreigners, and, on account of its spacious squares,

elegant streets, and magnificent buildings, seems well entitled to this distinction, is 107 miles distant from London, and about twelve miles from Bristol. It stands on the banks of the Avon, in a deep narrow valley, which is well sheltered by the range of hills on all sides, excepting to the north-west, where the vale expands into rich meadows. The various names, which, at different times, have been given to Bath, are obviously derived from the quality or uses of its copious mineral springs; and hence the "Hot Waters" of Ptolemy, "Waters of the Sun" of the Romans, the "City of Baths" of the Britons, and the "City of Valetudinarians" of the Saxons.

Attracted, probably, by its warm springs, the luxurious Romans selected Bath as a favourite residence, and made it one of their chief towns, during their stay in Britain. It was strongly fortified, and adorned with temples, baths, and other public edifices of the most magnificent description. But two hundred years had scarcely elapsed from the departure of the Romans, when the remains of this splendour could only be traced in the fragments of columns, sculptures, and other

architectural decorations, inserted into the walls, which the invading Saxons had constructed for their own defence; and the remains of an elegant structure, destined to the purpose of a sudatory or vapour bath, was discovered in 1755, about twenty feet below the surface.

Bath is one of the greatest resorts of fashionable company in the kingdom. The best and most elegant accommodations are provided for those who seek health, or pursue pleasure. The vicinity affords the most delightful walks and rides, and the amusements, for which every conveniency is supplied, are regulated and conducted according to the most polished forms of etiquette.

The Bath waters arise from three copious springs, at the lower part of the town, and not far distant from each other; and so abundant is the supply, that the large baths are filled every evening with fresh water.

When the Bath water is first drawn, it is transparent and colourless, but becomes turbid by exposure to the air for a few hours, and deposits an ochery sediment. It has no smell, but is astringent to the taste when

hot from the pump; but when the water cools, it is deprived of this taste, and then leaves on the tongue only a slight saline impression. The temperature of the Hot bath is 117°, of the King's bath, 114°, and of the Cross bath, 109°; but then it is to be understood of the water fresh drawn from the pump; for, when it is exposed in the spacious baths, it is soon deprived of a part of its heat.

The solid contents obtained from an English pint of the Bath water amount to about 14 or 15 grains, two-thirds of which consist of sulphate of lime, and the remainder is composed of muriate of lime and muriate of magnesia, with a small proportion of sulphate of soda, silica, and oxide of iron. It contains also about one cubic inch of carbonic acid in the same quantity of water.

The internal use of the Bath water is recommended in those disorders in which a deficiency of nervous energy is prevalent, in visceral obstructions, and especially in affections of the liver, which are indicated by hardness and distension, and in the consequent deranged condition of the digestive

organs, when symptoms of jaundice make their appearance.

An agreeable sensation of heat of the stomach, succeeded by an increase of appetite, and a greater flow of spirits, and a speedy diuretic effect, are regarded as the sure indications of the beneficial influence of the Bath water on the system; but if its use be followed by a sense of weight in the stomach, sickness, headache, thirst, parched tongue, and dry skin, it must be relinquished for the time.

The quantity of water to be taken daily, it is obvious must be in a great measure regulated by the constitution of the patient. In some cases, an English pint divided into three portions, two of which are swallowed at intervals before breakfast, and the third afterwards, is recommended; and in other cases, a pint and a half, or two pints, divided and drunk in the same way, are prescribed. But the safest practice, at least with delicate or irritable habits, is to begin the course with small doses.

As the temperature of the Bath waters is so much higher than that of the human bo-

dy, it is natural to expect that the effect should be greater than the ordinary warm bath. It seems necessary, therefore, to watch its effects with more attention, especially when the hot bath is employed, which is eight or ten degrees higher than the temperature of the body. In many cases it seems extremely probable, that the water heated so many degrees above the temperature of the body, may produce very beneficial effects; but other cases may occur, in which this increased temperature may prove injurious. Should headache, or any degree of giddiness, be the consequence of using the warm bath, to persons of a feeble habit of body, it must be abandoned for the time; and perhaps it might be a judicious plan to begin with the Cross bath, the temperature of which approaches nearly to that of the human body; then to use for some time the King's bath, the temperature of which is a little higher; and last of all to employ the Hot bath.

After all that has been said by medical writers, it seems doubtful whether any peculiar benefit is to be ascribed to the waters

of Bath, different from what may be expected from pure water raised to the same temperature. The whole effect, it is likely, depends on the heat; but as the uniformity of temperature is kept up during the whole time of immersion, in consequence of the great body of water, some advantage is gained from this circumstance.

That the reader may have some notion of the grand scale on which these baths are constructed, it may be worth while to notice, that the King's bath, which is about 65 feet in length, and 40 feet in breadth, contains more than 346 tons of water. The Queen's bath, which is separated from the King's by an arch, is about 25 feet square; the Hot bath is of an octagonal form, with a diameter of 21 feet; and the Cross bath is somewhat larger than the hot bath, and of an irregular form. The depth of each of these baths is about four and a half feet. Beside the public baths now noticed, private baths have been constructed, which, as well as the former, belong to the corporation of the city. A similar establishment of private baths, known by the name of the Kingston

Baths, has been formed by a private individual.

The warm bath is generally employed in the morning at this place; and where it is found to answer, this practice may be continued; but as this time may be inconvenient for many persons, it will be found equally beneficial two or three hours before dinner. The time of immersion, which is from ten minutes to half an hour, should be regulated by the feelings of the patient, who should not remain a moment longer in the bath, after experiencing any degree of faintness or lassitude.

To what has been already said of the diseases in which warm bathing is found beneficial, it is unnecessary to add any thing, as the same remarks are equally applicable to the use of the Bath waters for a similar purpose.

Topical warm bathing, called dry-pumping, because the water is applied to one part of the body, while the rest is kept dry, is much employed at Bath, and often proves a powerful remedy. By this mode of application the water is at its highest temperature,

because it comes immediately from the source, and is directed by the pump to the part affected. The duration of the application of the water in this way, is measured by the number of strokes of the pump, of which from 50 to 100 are used at one time.

BRISTOL.

THE celebrated spring called the Hot Well of Bristol, has its source at the bottom of St Vincent's rock, a lofty limestone cliff on the banks of the Avon, about a mile below the city, and four miles from the Bristol channel. The banks of the Avon abound with beautiful scenery, and the neighbouring hills, where the air is pure and salubrious, afford the most delightful and extensive prospects.

The water of the Hot Well rises from the bottom of the rock so copiously as to discharge about forty gallons in a minute. The water is perfectly transparent, and sparkles when poured into glass. The taste is agreeable, and is not different from that of pure wa-

ter, a certain indication that the foreign matter with which it is impregnated is small in quantity. The temperature of the spring is about 74°, and it continues nearly at the same point throughout the year. From this increase of temperature above that of other natural springs in the vicinity, this spring has derived the name of Hot Well. During spring tides, which arise to a great height in the Severn and Avon, the water of the Hot Well becomes turbid, although its source is considerably higher than the surface of the water in the river. This change is probably owing to the regurgitation of some other spring, by which the course of its waters, when obstructed by the rise of the waters in the river, is directed to the Hot Well.

The solid contents of the water of the Hot Well have been variously estimated by different chemists from forty-seven grains to fifty-seven grains in the gallon, of which seven grains are muriate of magnesia, four grains are muriate of soda, eleven grains are sulphate of soda, nearly twelve grains are

sulphate of lime, and thirteen grains are carbonate of lime. The gallon of water affords also thirty-three cubic inches of an elastic fluid, of which thirty inches are carbonic acid gas, and the remainder common air. The solid ingredients scarcely bring the Bristol Hot Well water under the denomination of hard water; and the proportion of carbonic acid gas can scarcely entitle it to the name of an acidulous water.

A gentle glow in the stomach is the first sensible effect produced by drinking the Hot Well water fresh from the spring; but sometimes it is said a slight degree of head-ache and giddiness succeeds. When its use is persevered in, it is found in many cases to be diuretic, while, at the same time, it keeps the skin soft and moist. Sometimes it has a tendency to produce constipation of the bowels, which requires to be counteracted by some mild aperient medicine.

To those who begin a course of the Hot Well water, it is recommended to take the first dose, which varies from a quarter to half a pint, as early in the morning as may be convenient; after half an hour's mo-

derate exercise, another glass is taken; and in the course of the forenoon two more glasses, with a similar interval, are swallowed. Perhaps some of the effects of the Bristol water are to be ascribed to its increased temperature. On this account, it should be used as it issues from the spring, for by keeping, or carriage to any distance, it would be diminished in temperature, and at the same time would be deprived of the greater part of its carbonic acid gas.

The water of Bristol Hot Well has acquired great celebrity in the cure of many diseases; and particularly in those bilious or stomach complaints, and general debility, to which Europeans are subject who have long resided in warm climates. Much has been attributed to the use of this water in the cure of consumption; but although it has probably acquired a higher reputation than what it is entitled to, as some medical writers have supposed, it seems not improbable, that along with the mild climate, it may have a beneficial influence in relieving some of the symptoms in the early stages of this disease; and indeed it is said to be particularly effi-

cacious in moderating the thirst, the burning heat of the hands and feet, and the partial night sweats.

TUNBRIDGE.

TUNBRIDGE WELLS, which is a populous village in the county of Kent, and about thirty-six miles south from London, is indebted for its origin and name to the mineral springs in the vicinity. Tunbridge has the advantage of a pure and salubrious air. The neighbourhood is remarkable for picturesque and striking scenery, and many elegant seats adorn the rising grounds. Every kind of accommodation for the pleasure or comfort of visitors is provided, whether in taverns, hotels, or private lodging-houses; in the amusement of the ball-room, or in conversation or reading in the coffee-house or library.

The trade of Tunbridge Wells, having a similar origin with that of the Spa in Germany, consists chiefly in the manufacture of various toys, well known by the name of

Tunbridge ware, including tea-chests, dressing-boxes, snuff-boxes, and numerous toys for children, made of plum-tree, yew, sycamore, beech, and holly.

The discovery of the mineral water of Tunbridge is dated early in the 17th century. The waters had acquired so much celebrity in the time of Charles I. that his queen Henrietta Maria spent six weeks at this place on account of her health; and as no house was near, she and her attendants lived in tents, which were pitched upon Bishop's Down; and in honour of her majesty's visit, the wells were called *Queen Mary's Wells;* a name which has since been changed to Tunbridge Wells, from the neighbouring village.

The waters of Tunbridge are of a chalybeate nature, and several springs have been discovered; but one only is now in use, the water of which is received into a capacious marble basin, and affords an abundant supply to the numerous visitors who annually resort to this place. The temperature of the water, as it issues from the springs, is about 50°, at all seasons of the year. When taken

up from the spring, it is perfectly colourless and transparent; it has no perceptible smell, and has only a slight astringent taste. When the water is exposed for some hours to the air, minute bubbles are seen on the sides of the vessel; the liquid becomes turbid; a yellowish iridescent pellicle forms on the surface; and in 24 hours, it is entirely deprived of its chalybeate properties, while a brownish sediment is produced.

The solid contents of a gallon of Tunbridge water, according to one analysis, amount only to five grains, and the elastic fluids given out by boiling the same quantity of water, are equal to sixteen cubic inches, of which ten inches are carbonic acid gas, four inches azotic gas, and the remainder atmospherical air. But, according to another analysis, thirteen cubic inches of gaseous matter were obtained from a gallon of the water, and the solid contents exceeded seven and a half grains, of which the chief ingredients are muriate of soda, muriate of lime, sulphate of soda, and oxide of iron, with a small proportion of muriate of magnesia, and of carbonate of lime; and, it

is said, with some traces of magnesia. The quantity of iron at the different springs of Tunbridge is different; and in the same spring, at different seasons of the year, a similar diversity in the proportion of the iron is observed. This difference, it is obvious, arises from the mineral ingredients being more or less diluted by an increased flow of the water from the fountain.

Although the waters of Tunbridge hold in solution a very small proportion of foreign ingredients, yet they have acquired, and perhaps deservedly, a high degree of celebrity in the cure of many diseases. Much of the virtue of the Tunbridge chalybeate is ascribed to the simplicity of its composition, which it is supposed amply compensates for its weak impregnation; and it is alleged that the iron, in a state of solution, may be conveyed into the circulation, for no other reason than that the water may be heated to the temperature of 140° out of the body, without decomposition. But, in this reasoning, it is forgotten that a series of changes, independent of heat, is going on in the stomach.

The effects of these waters, when they prove salutary, are an increased circulation, followed by an agreeable glow over the body, and an improvement of the appetite. These effects are said to be most striking in irritable and sanguine habits, and even in some, at the commencement of a course, nausea and slight giddiness are induced; but it seems not improbable that these symptoms might be traced to some other cause. The diuretic effect of these waters is considered as affording the most favourable proof of their salutary influence; and when they are used with free and regular exercise, they have a tendency to induce a gentle perspiration. The waters of Tunbridge are found to be peculiarly beneficial in impaired appetite, irregular action of the digestive organs, and in those chronic complaints which, without any local affection, are accompanied with general debility.

The dose of Tunbridge water usually prescribed, is from one English pint to three quarters of a pint, according to the age and constitution of the patient. The first dose is taken an hour before breakfast, and one or

two others in the course of the forenoon, so that the whole quantity to be used for the day, may be taken two or three hours before dinner.

It has been observed, that Tunbridge water, and no doubt others of a similar character, lose their effect when continued for some time. In such cases, it might be a useful practice to intermit the drinking for a few days, after which it may be expected the same effects as at first will be repeated.

To some persons of a delicate constitution, the water, as it is fresh drawn from the fountain, is too cold for the stomach, and sometimes occasions nausea or sickness. These unpleasant effects are obviated by slightly heating it, which is conveniently done by immersing a bottle of the water, well corked, in hot water, that the escape of the carbonic acid gas may be prevented. In many cases it has been suggested, that the occasional use of the warm bath may prove highly beneficial during a course of these mineral waters.

No fixed period can be assigned for the duration of a course of the Tunbridge wa-

ter, although it is usual to prescribe from one to two months for this purpose; but before coming to a decision on this point, various circumstances, some of which are scarcely appreciable, must be considered.

BRIGHTON.

THE situation of Brighton, which is finely sheltered by rising grounds on the north and north-east, has, no doubt, in some degree, contributed to render it a fashionable resort for sea-bathing. It is fifty-five miles distant from London; and, within the last fifty years, has risen from the condition of a fishing village, to the rank of a fine town. For this remarkable change, it is greatly indebted to the frequent visits of his present majesty, with whom it has become a favourite residence. This alone must attract the most distinguished company of the kingdom, for whose accommodation and amusement, lodging houses, assembly-rooms, public libraries, and a theatre, have been erected on elegant and splendid plans. Baths

of every description, as hot, cold, and vapour of salt and fresh water, have been commodiously fitted up; and the chalybeate spring, near the town, holds out another advantage to the invalid who visits Brighton.

The chalybeate spring, which is called the Wick, rises from the declivity of a small eminence, situated about half a mile to the westward of Brighton. The prevailing rocks in the immediate vicinity are chiefly limestone; but the soil from which the water rises is almost entirely of clay. A small building has been erected over the spot from which the spring issues, and the water is received into a basin of Portland stone, which contains only a few gallons; but, when it is emptied, soon fills again. The spring is always copious, and appears not to vary in its sensible qualities. When the water remains at rest for some time, a thin iridescent pellicle appears on the surface, and sometimes, also, a kind of yellowish scum, in irregular patches. When the thermometer stood, in the air, at 68°, the temperature of the spring was found to be at 54°.

When this water is taken up quite fresh, it has a peculiar faint smell, with a strong chalybeate taste. When it remains for a night in a vessel, the greatest part of the scum falls down, and forms a yellowish ochery sediment; and even in a close vessel, excluded from the air, the same effects follow in the course of a few weeks.

The solid contents obtained from an English pint of the Brighton chalybeate, amounted to eight and a half grains, composed of nearly two grains of sulphate of iron, four grains of sulphate of lime, one and a half grains of muriate of soda, with a small proportion of muriate of magnesia, and siliceous earth.

The chalybeate water of Brighton must, no doubt, prove beneficial in all those diseases which require tonic remedies, and which have been already noticed, in treating of similar waters, as the Hartfell, and Windgate Spa. It has been observed, by some of the practitioners on the spot, who have recommended this water, that it is apt to occasion, in some individuals, a degree of nausea, and a sense of weight in the sto-

mach, when it is taken cold; but when it is swallowed moderately warm, no such effects follow. In this respect, the Brighton chalybeate has the advantage of the Tunbridge water, because it may be heated without any material change in its composition.

ISLE OF WIGHT.

THE pure air and genial climate of the Isle of Wight have long rendered it a favourable retirement for sea-bathing; and the diversified surface, rich soil, and luxuriant vegetation, have procured for it the appellation of The Garden of England. At the towns of Ryde and Cowes, which are annually crowded with strangers, every accommodation is provided for warm and cold bathing. The rides and walks are highly romantic, the scenery truly picturesque, and, to those who are within reach of this island, no spot holds out more attractions as a watering place. But, besides the advantage of sea-bathing, a powerful aluminous chalybeate spring has been discovered, and will,

perhaps, render the Isle of Wight a still more attractive place of residence for invalids.

The spring is situated on the south-west coast of the island, and in a romantic spot, about two miles to the westward of the village of Niton. The water flows from a bed of loose quartzose sandstone, containing oxide of iron. The temperature was found to be 51°, when that of the atmosphere was 48°. When the water issues from the spring, it is perfectly transparent, and it remains unchanged for any length of time if it be put up and preserved in well closed vessels; but when exposed to the air, reddish flakes are soon separated, partly subsiding, and partly adhering to the inside of the vessel. It has the peculiar smell of chalybeate waters, and beside an astringent and harsh taste, it is somewhat sweetish, arising from the sulphate of iron, and sulphate of alumina. By boiling, carbonic acid gas is given out in the proportion of one hundredth part of the bulk of the water.

In ascertaining the quantity of solid contents obtained from this chalybeate water,

the amount varied in different specimens from sixty-three to ninety-two grains in the English pint of sixteen ounces. But the average amount of different trials gives eighty and a half grains of solid ingredients in each pint of the water, consisting of forty-one grains of sulphate of iron, thirty-one grains of sulphate of alumina, ten grains of sulphate of lime, three grains of sulphate of magnesia, sixteen grains of sulphate of soda, and four grains of muriate of soda, with a slight trace of siliceous earth.

This is the strongest of the mineral waters belonging to the chalybeate class that has yet been discovered in Britain, and perhaps its medicinal effects may be found too powerful for most constitutions; so that it may be necessary, especially at the commencement, to employ it either in very small quantity, or in a diluted state.

This chalybeate water was administered to the sick of the troops at the depot in the Isle of Wight, in cases of continued and intermittent fevers, pulmonary complaints, chronic dysentery, and rheumatism, and it was observed to have a rapid effect on the ap-

petite and spirits. The commencement of the course was generally preceded by a dose of Epsom salts; and in those of irritable habits, the water was diluted, and slightly heated. The quantity prescribed was at first only two ounces, or a small wine-glass full, to which some aromatic was added; and this dose was repeated three times a-day at least.

It has been suggested, that in obstinate agues, and in many other complaints where great debility prevails, Peruvian bark, or some tonic medicine might be very beneficially combined with the water; and from the use of the same water, along with diuretics, good effects might be expected in dropsical cases.

THE END.

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