

**The waters of Kreuznach : a work for general readers / by Charles Engelmann.**

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Engelmann, Karl, 1807-1861.  
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**Publication/Creation**

London : Williams & Norgate, 1854.

**Persistent URL**

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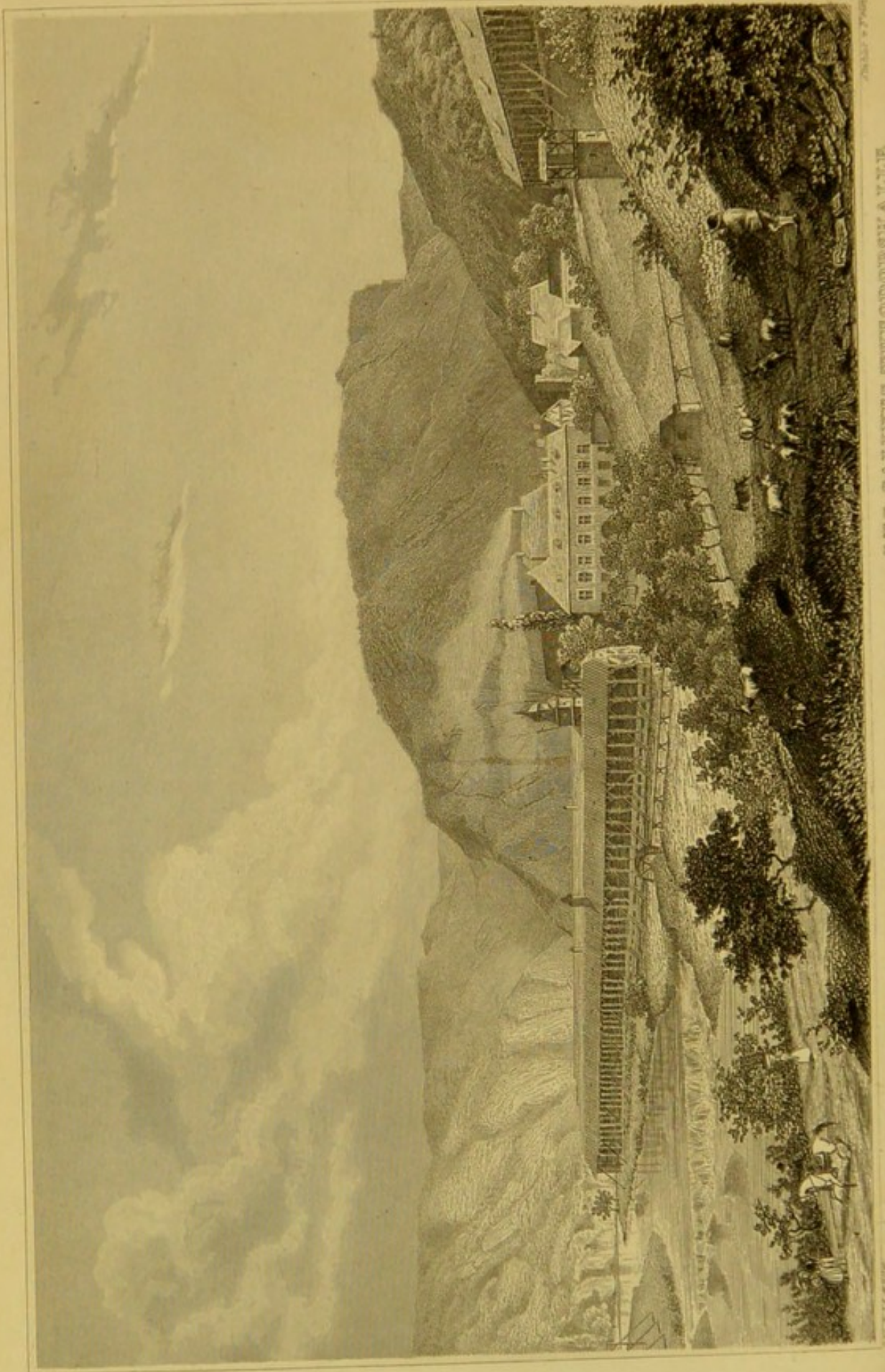
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LES SALINES THEODORESHALLE  
*vue de l'ouest*

SALINES THEODORESHALLE  
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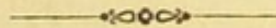
THE WATERS  
OF  
KREUZNACH,

A WORK

FOR GENERAL READERS,

BY

CHARLES ENGELMANN, M. D.  
PHYSICIAN AT KREUZNACH.



**LONDON,**  
WILLIAMS & NOR GATE,  
14 HENRIETTA-STREET, COVENT-GARDEN.

**KREUZNACH,**  
VOIGTLÄNDER.

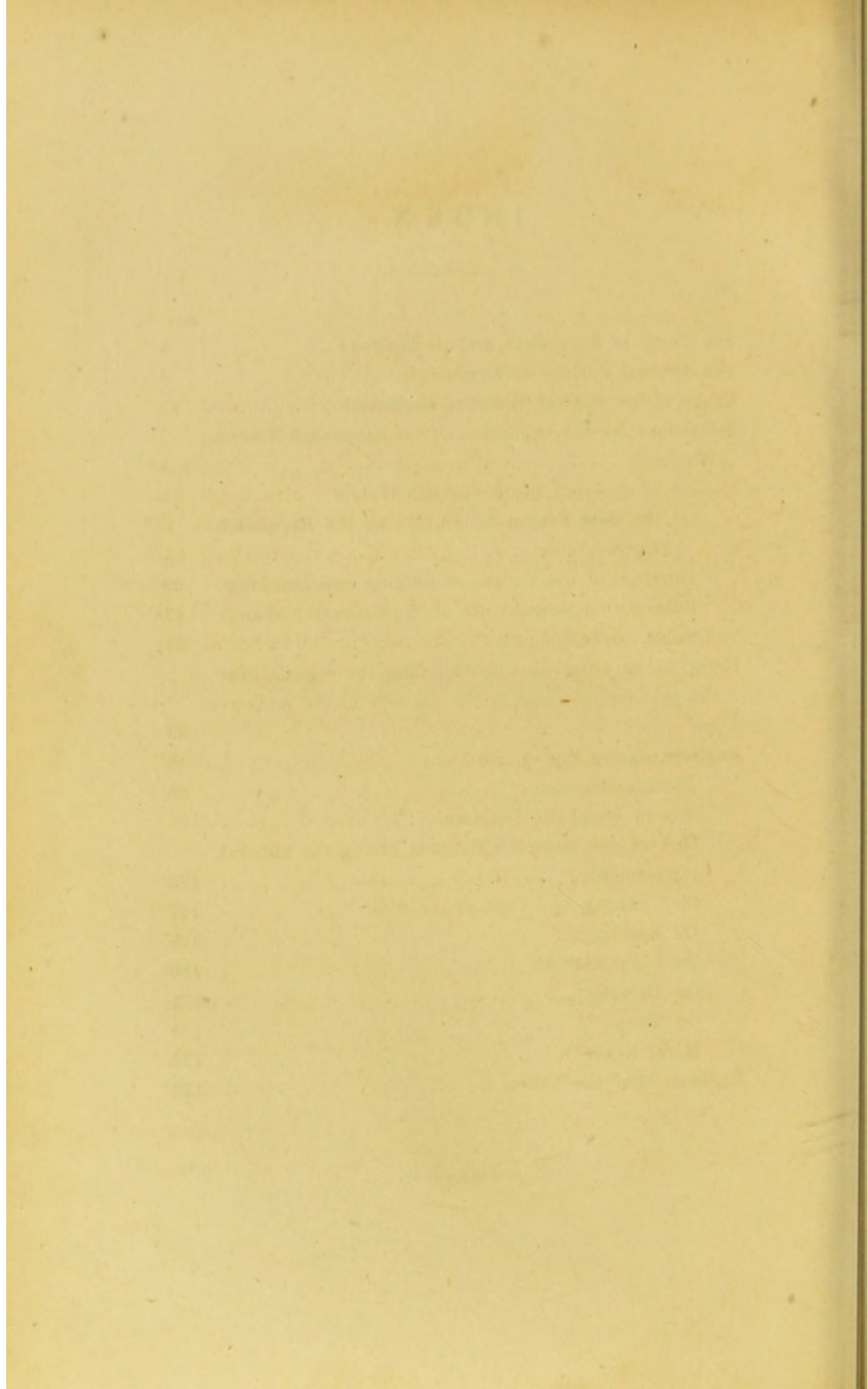
1854.

PRINTED BY  
C. ADELMANN IN FRANKFORT O. M.

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## P R E F A C E.

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The little work on the Mineral Waters of Kreuznach and their employment, published by the author of these pages ten years ago, and of which an English translation appeared at the time, can no longer be considered as sufficient. Ten years have brought important additions to our experience and have modified many of our views; besides which, several of the rules given in the work above-mentioned have, in subsequent practice, been found to require correction. The present pages are intended to supply the deficiency, and rectify the errors. Their immediate object is to serve as a sort of Hand-book to the invalid who visits our waters, to guard him from false steps that too frequently occur during the treatment, and to keep the directions of his medical adviser constantly in his memory. It has been



endeavoured to avoid whatever is superfluous or incongruous. In the course of the work several questions will be met with, the answers to which may appear self-evident. The author has written them down, simply because he has found in practice that they were often asked.

The book is not intended for the profession. With the general rules contained in it, every competent medical man is acquainted; and those referring to the special mineral treatment he will be able to deduce from the analytical tables of the waters, and from any knowledge of the local circumstances he may happen to possess.

It is hoped that the present pages may meet with a favourable reception, and often prove of service to the invalid.



THE  
TOWN OF KREUZNACH  
AND ITS  
ENVIRONS.

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At Bingen is the outlet of one of the finest lateral valleys of the Rhine. It is the valley of the Nahe. Following the course of this river by vine-clad hills and pleasant villages, we arrive at the town of Kreuznach. Distant seven miles (Engl.) from the Rhine, it is situated at a point where the Nahe emerging from a narrow valley bounded by rocky mountains traverses a smiling plain, and offers to the spectator the picturesque features of a mountainous region in happy union with a cheerful landscape. Intersected by the river, in two arms, the town is divided into two parts, one of which

leans against the high grounds of the left bank, while the other spreads itself out towards the plain. A stone bridge unites both sections of the town, and by the somewhat grotesque houses constructed on its piers presents a singular appearance. Kreuznach itself offers so little that is remarkable either in buildings or curiosities, that a traveller will seldom be induced to visit it for its own sake. It is irregularly laid out, the streets are narrow and crooked, but generally animated, and on the whole it presents the aspect of a prosperous provincial town. Two thirds of the inhabitants (10,000) are Protestants. Both their churches, however, display as little architectural beauty as the two similar edifices devoted to the Catholic rite. Close to the principal church of the Protestants are the ruins of the ancient Cathedral, of which only the choir is standing; this is in the pure Gothic style and constitutes the sole architectural curiosity of the town. During the summer English divine service is performed in one of the Protestant churches. Since the town has been included within the Prussian territory it has become the seat of the

Courts and Government Offices of the district; it possesses, besides, an excellent gymnasium, esteemed throughout Germany. There is a considerable business in wine carried on here; there are also tobacco manufactories and several tanneries. But the grand source of Kreuznach's prosperity is the cultivation of the vine, which is prosecuted with particular care and predilection.

Few, however, as are the attractions of the town itself, the beauty and variety of the surrounding country amply make up for this deficiency blooming. On all sides gardens, carefully planted vineyards, and luxuriant fields bear witness to the fertility of the soil. The whole valley of the Nahe, about 30 Engl. miles in length, is one of the most picturesque of the numerous vales that branch off from the Rhine; and it is in the immediate vicinity of Kreuznach that the most varied and remarkable portion of this valley, especially with regard to the geological formations, is to be found. In consequence of this romantic situation Kreuznach is visited from far and near; and since the Rhine has attracted the attention of the travelling public, few who delight in the

beauties of Nature neglect to make an excursion to our neighbourhood.

As may be supposed, this affluence of strangers and the importance and prosperity of the town have been immensely increased by the discovery of the *Elisen* spring, which has given Kreuznach a place among the mineral Baths of Germany. Since that period the importance of the place has gradually augmented from year to year, and at the present day the reputation of Kreuznach is such, both at home and abroad as to render it one of the most renowned watering-places in Europe. A new quarter soon began to rise up around the *Elisen* spring. The immediate environs were turned into shady promenades, a Kur-house was erected, and every year saw fresh buildings spring up for the accommodation of strangers; and it is particularly within the last ten years that the continued affluence of visitors has in this respect aroused the speculative spirit of the inhabitants. Thus, the town has gradually been connected with the spring by a row of stately edifices, while the whole plain towards the *Salinen* valley is studded with hotels and private dwellings.

As a natural consequence of such an influx of strangers, speculation has not been slow to provide those requisites and conveniencies which the wealthy either demand or unwillingly dispense with. The latter may therefore be sure of finding elegant apartments and a luxuriously furnished table, while the less opulent may be equally certain of meeting with those modifications in regard to accommodation, that may suit his pecuniary resources. Authorities and private individuals unite in doing their utmost to render a sejour at Kreuznach agreeable. The comfort of invalids during their walks is particularly attended to, by laying out convenient promenades and constructing places of shelter and repose. Almost every year brings forth some new establishment for public entertainment, at one of the many picturesque spots in the vicinity. There is, besides, no lack of concerts, balls, and theatrical representations; during the season artists of eminence often visit Kreuznach. The stranger will find also reading-rooms, circulating libraries, and teachers in almost every branch of art\*) and science. Roulette and *trente*

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\*) The writer cannot refrain from mentioning the studio of

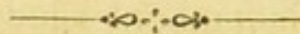
*et un* are fortunately not to be found in Kreuznach. The advantage of such a want in a bathing-place like ours need not be expatiated upon.

The majority of visitors come to these waters in search of health, and desirable as it is that the residence in a watering-place should be rendered agreeable by a moderate supply of comforts and amusements, yet all these advantages are as nothing, compared with the enjoyments offered by Nature. In this respect Kreuznach presents us with a variety sufficient to gratify the taste of the most fastidious. We find woodland and meadow alternating with picturesque rocky glens; the heights around afford the most diversified prospects, while the summits of the mountains on all sides are crowned with interesting ruins with which, as for instance in the case of the *Ebernburg*, some of our most romantic historical reminiscences are connected. Besides these walks in the immediate neighbourhood, the whole valley with

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the sculptors Cauer, father and son. Even at the risk of displeasing these artists, he feels obliged to praise their instruction in drawing, especially of landscape from nature, neither can too much enlogy be bestowed on their busts and statuettes.

its numerous branches, affords the visitor frequent occasion for more distant excursions; very good roads lead to Stromberg, to the castles of Dalberg and Sponheim. to the ruins of the ancient monastery of Desibodenberg, to Altenbaumburg and to the castle of Dhaun. The friend of natural science will find here an inexhaustible field of enjoyment; the Flora of our environs offers a rich variety of uncommon plants, while the geognost will meet with most interesting geological details in the porphyry and agate of the older sandstone formations, in rare minerals and petrefactions, quicksilver, fluor spat, brenite etc.





THE  
MINERAL SPRINGS  
OF  
KREUZNACH.

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The low hills that border the valley of the Nahe from Bingen to Kreuznach begin, a little above the town, to assume a loftier form. A volcanic production, porphyritic rock, here breaks through the superincumbent sandstone and shapes itself into the picturesque mountains and dome-like rocks of the *Salinen* valley. It is in this porphyritic formation that the various saline springs take their rise; and the most important one, the Elisen spring, gushes forth nearest to the town. The original source of these waters being the same, the individual springs scarcely differ in a qualitative point of view; it is only in the quan-

tity of the components and in the temperature (from 54°—83° F.) that any variation is to be observed. The water belongs to the class of iodated and bromated saline minerals; its principal ingredients are: chloride of sodium, chloride of calcium, iodine and bromine. For the purpose of drinking, the *Elisen* spring is employed. It is situated a short distance above the town, at that point where the river, dividing into two branches (which join again below the town), forms a long low island. The spring is protected from inundations by a strong stone dam. Its temperature is constantly 54° F. The water is clear and almost colourless; the taste saline and bitterish, and the odour somewhat resembles that of sea-water. It contains in 16 ounces 94 grains of the following substances:

Chloride of sodium . . . .	72,88
„ of calcium . . . .	13,38
„ of magnesium . . . .	4,07
„ of potassium . . . .	0,62
„ of lithium . . . .	0,61
Bromide of magnesium . . . .	0,27
Iodide of magnesium . . . .	0,03
Carbonate of lime . . . .	1,69

Carbonate of baryta . . . . .	0,01
Magnesia . . . . .	0,10
Oxide of iron . . . . .	0,15
Phosphate of alumina . . . . .	0,02
Silica . . . . .	0,12
	<hr/>
	94, 02

When the water is intended to be used for bathing, it is taken from the principal well of the salt-work *Carlshalle*. The temperature of this water is 75° F. and the proportion of ingredients, 104 grains in 16 ounces. The well of the salines of Münster has a temperature of 86° F.

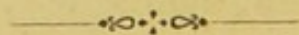
The baths at the *Kurhaus* receive their water from an adjacent source which rises in the bed of the river; a steam-engine forces the water through pipes into the baths. The spacious bath-hotel, the *Oranienhof*, is supplied by a copious spring of its own, the contents of whose water are similar to those of the well at *Carlshalle*. Accurate analytical tables of all these springs have been published, but as each table differs but little from that of the *Elisen* spring I have not thought it necessary to give the others.

In the composition of the baths the Mother-

lye (Germ. Mutterlauge) plays a very important part. This term, it must be explained, is applied to the fluid residue remaining in the boiling pans, after the salt has by means of sufficient evaporation of the water been crystallized, and taken out. It is a transparent, brown-yellow liquid, of a consistency little less than that of oil. The smell has some analogy to that of tang; the taste is extremely salt, bitter and caustic. It contains the elements of the saline water, with the exception of the greater part of the common salt and the iron, in a highly concentrated state. According to the most recent and accurate analysis, 16 ounces of this liquid contain 2484,16 grains of solid substances, or about one third of its contents, viz:

Chloride of calcium . . . .	1789,97
„ of potassium . . . .	168,31
„ of sodium . . . .	226,37
„ of magnesium . . . .	230,81
„ of aluminium . . . .	1,56
„ of lithium . . . .	7,95
Bromide of sodium . . . .	59,14
Iodide of sodium . . . .	0,05
	<hr/>
	2484,16 gr.

It is particularly to this „*Mutterlauge*“, that Kreuznach is indebted for its great reputation in foreign countries and for the quickness of its growth as a watering-place. It is exported in considerable quantities either in a fluid state or evaporated till dry, under the name of „*Kreuznacher-Mutterlauge*“, for the purpose of being used in baths. By adding a suitable quantity of this *mother-lye*, together with common salt, to a bath of common water, a fluid may be prepared, which has the greatest resemblance to that of the saline baths of Kreuznach. An opportunity is thus offered of trying the effect on the patient at home, and should the results be encouraging, the medical adviser will be enabled with greater confidence to recommend Kreuznach itself.



EFFECT OF THE  
MINERAL WATER  
OF  
KREUZNACH.

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The mineral water of Kreuznach is exhibited both internally and externally; the latter in the form of baths. The possibility of combining the two methods of application gives it a decided preference over other saline waters that greatly resemble it. This advantage is attributable to the fact that, in all other saline springs hitherto known, there are always ingredients that render the water very difficult of digestion; such noxious agents are mostly sulphates and especially the sulphate of lime, or gypsum. The waters of Kreuznach, on the contrary, do not

manifest any traces whatever of these constituents, and are therefore easily supported by the most sensitive stomach and by the weakest constitution. Far from disturbing the digestion this water even facilitates the process and promotes appetite. Such a result, however, takes place only when a *proper* quantity is administered a quantity proportioned to the age, and constitution of the patient, to the stage of his disease and the sensitiveness of his stomach. Taken too copiously, it produces diarrhœa; and if this course be persisted in, disturbance of the digestive functions will ensue.

The efficacy of the baths depends partly on the temperature of the bath, partly on the constituents of the water. These constituents act freely and with the highest degree of intensity only then, when the temperature of the bath is such as to produce no variation of the pulse. Experience has proved beyond doubt, that in this state the skin is most inclined to absorb the efficacious components of the mineral-water, with which it is brought in contact. The degree of warmth, however, at which this takes place, differs considerably according to age, constitution,

sex, condition of the skin, and state of disease. As a rule, it ranges from  $86^{\circ}$  to  $93^{\circ}$  F.

If the bath consist only of pure salt water, the bather will not be conscious of any particular sensation; the impression will be that of a bath of common water. But if, as is necessary in advanced or obstinate cases, mother-lye be added to the bath and the quantity gradually increased, the body will, sooner or later, according to the relative irritability of the skin, be subject to certain sensations. At first a prickly feeling is perceived in different parts of the body; on continuing the baths, this feeling is diffused over the whole surface, and, when the additions of mother-lye are constantly augmented, passes into a burning sensation. The skin assumes a red hue, which, together with the feeling of heat, remains for hours after having bathed\*). It is here proper to remark, that a bath ought never to be strengthened to such a degree as to produce the burning sensation alluded to. If

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\*) Experiments, which the author of these pages has of late years carefully tried, prove, that when the body is in a healthy state, the resorption is strongest in a bath of  $90\frac{1}{2}^{\circ}$  F., that it decreases in higher and lower temperatures, that it is but slight at  $86$  and  $96^{\circ}$  F. and ceases entirely at  $80^{\circ}$  and  $98^{\circ}$  F.



a due temperature, a suitable proportion in the additions of mother-lye and a proper duration of the bath be observed, the bather will never experience any disagreeable feeling; on the contrary, after quitting the water, he will be sensible of a certain degree of elasticity and freshness, and never of exhaustion or weakness; he will never experience giddiness or head-ache in consequence of congestion to the head; the skin will never become sensitive with regard to the influences of temperature, neither will there be any general inclination to take cold. Should the patient, after bathing, complain of giddiness, head-ache, or lassitude, we may be assured that the bath was too warm for his individual constitution. The temperature, and not the ingredients of the bath, is the cause of indisposition. In the course of these pages we shall indicate how the bather is to find the temperature suited to his individuality.

As a rule, the effect of the water, and the consequent partial or total cure of the disease, takes place without presenting distinct crises. Only in cases where there exists disposition to affections of the skin, or where there has been a suppression

of cutaneous disease, do eruptions take place sooner or later, but never before the 30th bath, in the form of pustules or furuncles. Such eruptions always bear a critical character and are to be looked upon as a favourable sign. They generally disappear during the bathing treatment, or very soon afterwards. In cases where previous cutaneous eruptions have by unsuitable treatment been repelled into the interior, these eruptions break out again during the course of waters in those parts of the body where they formerly existed, nor do they disappear till the whole system has been improved by the bathing treatment, and the disposition to cutaneous disease annihilated. — Generally speaking, the use of these baths gives the constitution a tendency to eliminate peccant matters by the excretory organs; or, should there not be sufficient vigour in the system to perform this, at least the more important organs are freed from the morbid matter, which then settles on organs of less significance for the general system. In course of the treatment it is not uncommon for bluish spots to show themselves on different parts of the skin, and these, like the marks resulting from con-

tusion, gradually change their colour to green and yellow, and after a few days disappear. Whenever such spots become visible, a favourable issue of the treatment may with confidence be expected.

An appropriate and sufficiently continuous treatment at the baths of Kreuznach will have the effect either of producing a cure, if the disease be not too inveterate; or, symptoms will be manifested that the body is already so saturated with the ingredients of the water, as to be unable to receive an additional quantity. A feeling of uneasiness, oppression of the head, lassitude throughout the body, a sudden repugnance to the bath, hitherto taken with pleasure, a salt taste in the mouth and, on persevering with the course, a febrile condition, become perceptible. Before, however, these unmistakable symptoms appear, the change of the pulse (it becomes quicker) announces to the physician the approach of this so called point of saturation, and that the treatment must now be terminated, even if a successful result has not yet been attained. After the lapse of a few days the symptoms mentioned above, disappear. The ef-

fect of the treatment, however, does not cease with the discontinuance of the latter. The effective components of the water which, by resorption through the skin and the stomach had been gradually introduced into the blood, are now withdrawn from it by the different excretory organs in order to act beneficially on diseased structures. This after-effect continues for several months, except it be disturbed by imprudence on the part of the patient, or by accidental malady. In very inveterate cases, indeed, it is not till now that the curative process begins to take place, and to progress till the ingredients admitted into the body by absorption are again excerned. It even often occurs that patients leave Kreuznach with their diseases apparently aggravated. Instead of cutaneous eruptions having disappeared, new ones have broken out, while swellings of the glands, instead of being cured, increase in size and number. The patient listens with incredulity to the consolatory assurance of his physician, that the result of the treatment is to be considered as favourable, the morbid matter being now set in motion and on the point of being expelled; that by the morbid matter being

deposited on external glands or on the skin, internal organs are freed from its deleterious influence, and that the after-effect of the mineral treatment is powerful enough to bring improvement and cure to the parts still affected.

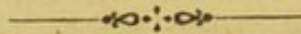
If the bath be taken too strong, or if the patient remain in it beyond the period prescribed by his disease and constitution, the resolvent effect of the mineral ingredients will not be confined to the disease. This effect will extend also to the healthy parts of the body, and particularly to the glandular organs. Their substance will begin to fall away, their size to diminish; their functions will be disturbed, — of course not without injurious influence on the whole organism.

With respect to the methods of employing the treatment, the drinking and bathing courses are to be considered as reciprocally aiding each other. But if the question be raised, to which form of application the greatest efficacy is to be attributed, we must give the preference to the external form. For, through the skin it is possible, without any disturbance of its functions,

to introduce much larger quantities of mineral substances into the blood (and consequently into the system) than would be attainable by the means of the stomach, the functions of which would be continually deranged by such abundant doses.

From the operation on the organism of the individual ingredients, taken separately, every practitioner who is acquainted with the analysis of the waters of Kreuznach, will be able to judge on what systems of the body these waters are more especially calculated to act, and in what manner their exhibition will eliminate morbid matter, and restore diseased parts to a normal state. Their principal effect is undoubtedly directed to the lymphatic system, the action of which is strengthened; by this effect, those diseases that are attributable to a want of activity in the lymphatic vessels and glands, are cured. And even when the lymphatic system itself is not in a diseased condition, yet, from various noxious influences, indurations may have been formed in particular organs; and in such instances, the augmented activity of the lymphatic system and its resor-

bents (produced by the use of the waters) affords a possibility of the indurations being dissolved, their consequences on the organism removed, and a state of health re-established.



INDICATIONS  
FOR THE  
EXHIBITION OF THE KREUZNACH MINERAL  
WATERS.

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From what has already been said with regard to the operation of these waters, we may easily infer what forms of disease are likely to find a cure at Kreuznach. They are the following:

- 1) That numerous class of diseases founded on disorders of the lymphatic system.
- 2) Indurations and hypertrophies of particular organs, unaccompanied by affections of the lymphatic system.

The *first of these categories* occurs chiefly in children and young persons who have not yet attained the age of puberty, and comprises those morbid forms termed lymphatic diseases, or on



reaching a certain degree of intensity, — *scrofula*. The morbid principle of these diseases is developed under favouring circumstances in an hereditary or acquired disposition and, affecting principally the glands of the neck, occasions in them swelling, indurations, and suppuration. But this morbid matter often attacks other parts and systems of the body, producing the most varied forms of disease, the quality of which, however, as they arise from one cause, is identical, and consequently these forms are curable by identical remedies. Thus, we find among the patients who visit Kreuznach, and generally with success, diseases in very different forms and affecting very different organs. The desirable result, however, takes place only when the disease is based on an affection of the lymphatic system; and, we repeat it, there is scarcely a form of this malady, which may not be observed among those who visit our spring. The majority of these suffer from tumefaction and induration of the glands of the neck; some from discharges of the mucous membrane of the ear, hardness of hearing and deafness in consequence of affections of the Eustachian tube; others from

inflammations or ulcers of the eyes, or affections of the borders of the eye-lids; some from affections of the mucous membrane of the nose, or indurations of the tonsils; very many have scrofulous eruptions of the skin, or even the most malignant forms of lupus; or we find affections of the periosteum or the bones, swellings of the joints, white swellings of the knees; affections of the vertebral column and their consequences, curvatures of the spine; again, among a numerous class of patients the morbid symptoms are not yet clearly developed, and it is only in their entire habit that the disposition to lymphatic disease manifests itself.

If the predisposition to lymphatic diseases be not eradicated in youth, after the age of puberty the character of the malady undergoes a change. Either, — under favouring circumstances and in case of hereditary inclination to pulmonary affections, — the scrofulous acrimony throws itself on the lungs and occasions consumption, or, a peculiar hæmorrhoidal diathesis is formed, that is especially apt to give rise to the most obstinate forms of cutaneous disease. Such forms of disease, which medical practice

comprises under the names of *eczema* (an eruption, beginning with vesicles, which cause violent itching and secrete a serous fluid in considerable quantities) and *psoriasis* (a roughness and scaliness of the skin with a redness underneath) are often sent to Kreuznach for treatment, after the most active remedies, arsenic not excepted, had been employed for years not only without success, but even without momentary improvement.

The *second class of diseases* curable by the waters of Kreuznach, comprehends principally complaints of females, such as *kindly indurations of the pectoral gland, swellings and enlargements of the uterus, tumours in the cavity or the substance of the uterus, swellings and indurations of its cervix and of the ovaria*. The consequences of these local diseases are, irregularities in the menstrual discharge, leucorrhœa, and in married females inclination to abortion and sterility. The statement will not excite surprise, that by a bathing course at Kreuznach these morbid conditions may be removed, when they appear as symptoms or results of the affections specified above. Real scirrhus and cancer

are as little cured by our waters as by every other remedy. A number of female patients with scirrhus of the breast are, however, immediately prior to operation sent to Kreuznach in order that *the morbid disposition may be annihilated* and a relapse avoided.

In all the forms of disease just enumerated, we are fully justified in prognosticating cure, or at least improvement, as the result of a treatment at Kreuznach; of course with the proviso, that the complaint has not become incurable and that the patient strictly observes the prescribed regimen.

Among those diseases which we have designated as belonging to the second class, there are often cases in which we must be satisfied if we can but obtain some improvement, or only arrest the farther progress of the malady. It is even possible, that the disease may have become so inveterate and the whole constitution so exhausted, that every attempt at cure must prove hurtful, and in such instances the use of the Kreuznach waters would not only be of no service, but could not fail to be highly injurious. It is only by the most careful

diagnosis that the most serious mistakes can be avoided.

Pregnancy, generally speaking, does not forbid the employment of the Kreuznach waters. A cautious and not too strong treatment will even have a double effect, i. e. on the fœtus and on the mother. Suckling may, without hesitation, be continued during the course.

Whether the effect of the Kreuznach waters on the forms of disease mentioned above, may entitle it to a preference over similar mineral springs, is a question which the writer leaves to be answered by other physicians, who, in so doing, will not lay themselves open to the charge of pleading *pro domo*. A few opinions of this kind may, perhaps, not be considered out of place here.

One of the most distinguished living German practitioners, Dr. Kopp, by whom public attention was first directed to the advantages of Kreuznach, denominates these waters „one of the first and most excellent remedies in all forms of scrofula“, and adds „I have witnessed incredible effects resulting from their employment“. It is especially in the forms of cutaneous disease,

referred to above, that he extols the efficacy of our waters. His words are: „I am not acquainted with any remedy that surpasses or comes up to their effect in the most obstinate forms of these diseases, and have seen cases of 10 and 12 years' standing, cured by the use of the baths“. — Dr. Vetter, an eminent writer on mineral waters, says: „The vigorous effect of saline and iodated springs in all lymphatic diseases being placed beyond doubt, the powerful combination of the waters of Kreuznach allows us to expect the removal of even the most inveterate forms, when based on a scrofulous disposition“, and in continuation: „Most assuredly Kreuznach will preserve the reputation it has obtained, as long as diseased glands and lymphatic vessels, affections of the mucous membranes and tuberculous diseases exist“. Prof. Trousseau, of Paris, in his work on mineral springs, in which he expatiates at some length on the effect of Kreuznach, writes as follows: „Kreuznach jouit en Allemagne d'une reputation meritée pour le traitement des affections scrofuleuses; les malades y affluent et l'expérience s'appuie sur un assez grand nombre de sujets pour être

inattaquable“. The latest English author on mineral waters, Dr. Sutro, says: „In whatever form the (scrofulous) disease may appear, whether the glands of the neck be swollen and indurated, or whether the eyes, ears, nose, mesenteric glands, or bones become affected, Kreuznach will be found highly beneficial“ and „it will be sufficient to convince ourselves that scrofula forms the base of the disease, in order to advise unhesitatingly a visit to Kreuznach“.

The renown of our waters as an efficacious remedy in female complaints is mainly attributable to an opinion pronounced by the celebrated professor of midwifery, Dr. d'Outrepont, who, in an essay on this subject, quotes a series of cases from his own practice, which met with a cure in Kreuznach; and for this place he claims a pre-eminence over other mineral springs, in complaints of the nature referred to.

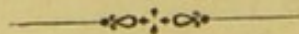
„A great advantage of Kreuznach“, says Dr. Sutro, „over similar springs with a prominent amount of iodine and bromine, lies in the circumstance that we may employ Kreuznach both internally and externally in appropriate diseases, whilst in many powerful springs

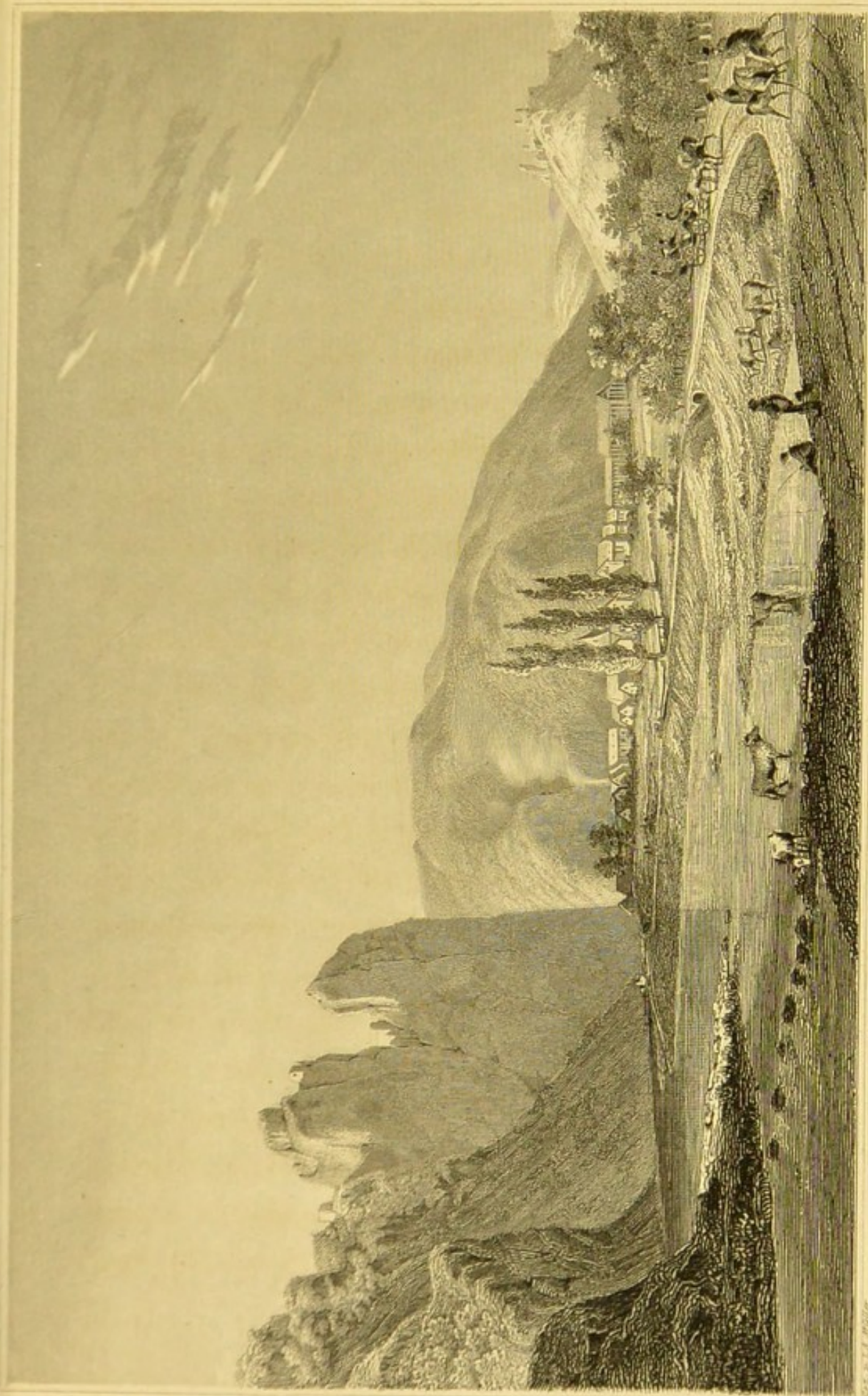
of the same class the physician is restricted either to internal administration (as in the Adelheidquelle of Heilbrunn, through scantiness of supply) or to external (as Oeynhausen or Rehme, Ischl etc.) This double action becomes highly important<sup>66</sup>. With this advantage another, that cannot be too highly appreciated, is (in the case of K.) connected, and powerfully seconds the sanative action of the water. This advantage is — the *Climate*. Residence in a healthy place and constant enjoyment of the open air, act favourably on the treatment of every disease, and, above all, on those morbid conditions that are most frequently to be met with at the Baths of Kreuznach. It is a well-known fact, that no situation is calculated to act so beneficially on all lymphatic diseases as an open part of the country in the vicinity of moderately high and wooded hills, and which, being exposed to the sun the whole day, is warm and dry; where there are no sudden transitions of temperature, and where foggy days are a rarity; where the air circulates freely, marshes or standing water are not to be found, and where consequently intermittent fever is



unknown. All these conditions are fulfilled by Kreuznach.

That the climate is mild, the winters not severe, is amply proved by the character of the surrounding vegetation, which includes a number of plants belonging to a more southern latitude. Thus we see whole avenues of almond trees, bringing forth every year abundance of fruit, while the neighbouring hills and mountains are clothed with the luxuriant vines that produce the strong wines for which the valley of the Nahe is renowned. The general health of the population and the low degree of mortality afford evidence of the salubrity of the climate; dysentery never occurs in an epidemic form; the cholera did not reach Kreuznach, and with intermittent fevers the inhabitants are totally unacquainted, while cases introduced by strangers are easily cured. That scrofulous maladies are to be found among the natives, especially those of the poorer class, is not to be ascribed to the climate or situation of Kreuznach, but to causes that in the present state of society and manner of living cannot be absent from any place, whatever its situation may be.



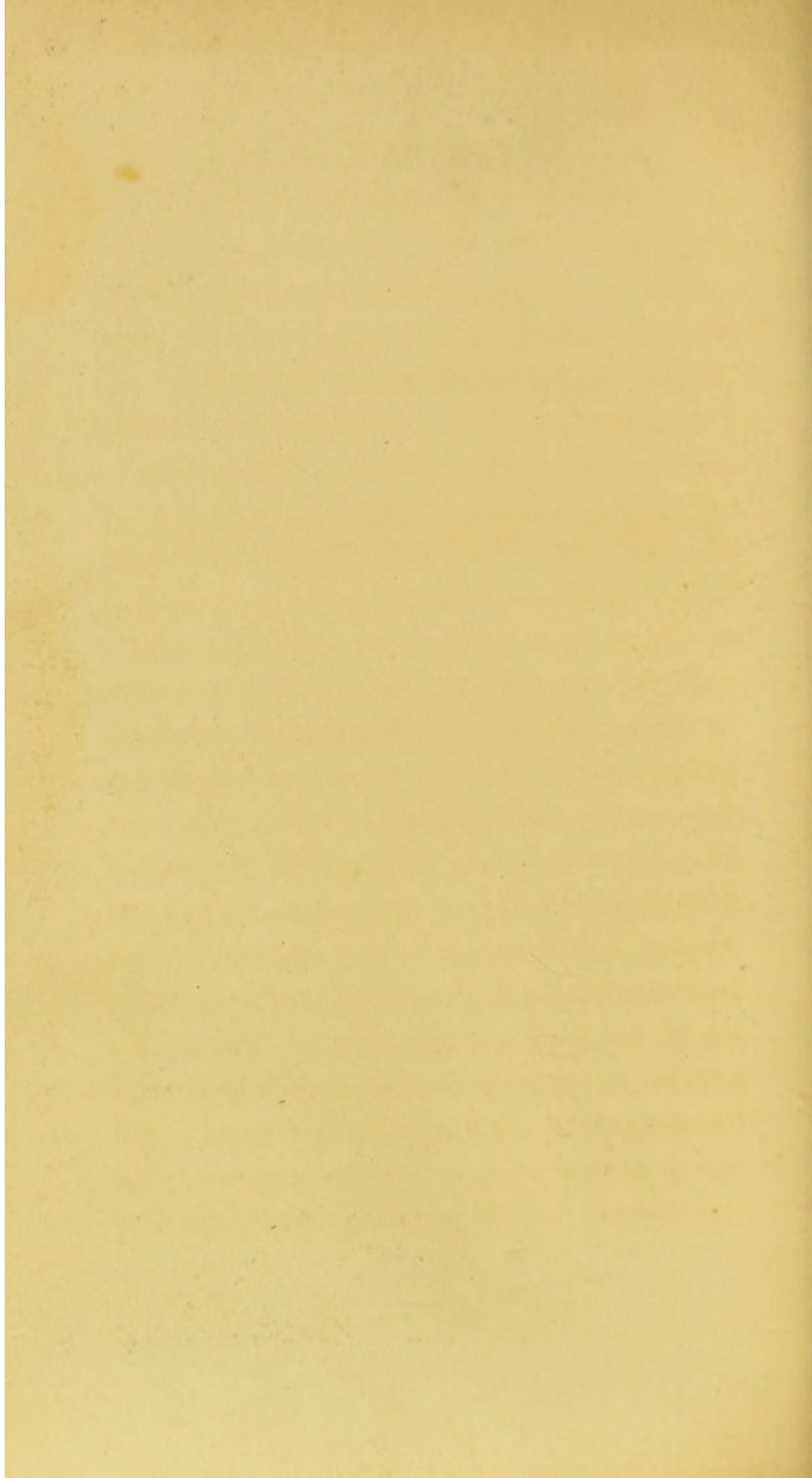


CHARRAS FINE

LES SALINES DE MÜNSTER  
LE RHEINGRAFENSTEIN LES RUINES D'EBERBURG

SALINE MÜNSTER  
RHEINGRAFENSTEIN RUINE EBERBURG

DE WILHELM



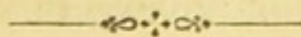
METHOD  
OF  
APPLYING THE KREUZNACH WATERS.

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It will devolve on the domestic physician to determine whether a treatment at Kreuznach is likely to prove advantageous in an individual case, and if so, to furnish some general rules as to the method of application, such as, whether the internal and external courses are to be used; whether the patient is to take strong or weak baths; and also to make an approximative calculation of the length of the treatment. But it is not possible at the commencement of the course to foresee all the contingencies that may occur during its progress. It will be necessary for the medical adviser carefully to watch over

the whole treatment, attentively to observe the operation of the water, and to modify the strength and duration of the baths according to the effect manifested on the organism. „It is“, says a celebrated authority, „a very unadvised proceeding for the home physician to send his patient to a bathing-place fettered with a catalogue of directions, which regulate his mode of living, as it were, from hour to hour, and prescribe by anticipation the exact number of glasses he is to drink during the whole treatment. For, who can calculate all the manifold contingencies and circumstances that may happen to the patient! and the practitioner at the Bath, if he be a conscientious man, finds himself placed in the distressing dilemma, either of directly opposing the rules of conduct brought from home, thereby shaking the patient's confidence in his regular medical adviser, or, he must sacrifice his better judgement, and, against his convictions, tolerate a course of proceeding which he knows to be injudicious“. Undoubtedly there exist rules, especially in regard to diet, as will be seen below; but most of them must be adapted and modified to the peculiar case. It may here be re-

marked, that some persons often conduct their own treatment without having consulted either their domestic or the Bath physician, and take as a guide the prescribed regimen of some one of their acquaintance who, according to their idea, has suffered from the same complaint. Now two persons may have the same complaint, and yet their constitutions and susceptibility for medicaments be so dissimilar, that though they both require the same remedy, it must be administered in very different doses. Of equally frequent occurrence is the circumstance that patients arbitrarily over-step the rules laid down by the physician, and unknown to him, try stronger baths than those prescribed, because they may have seen such large additions of *mutterlauge* supported by others whose constitution *they* consider weaker than their own. The medical adviser is seldom acquainted with these fitful transgressions till the injurious consequences have begun to make themselves felt; and their removal is often difficult and tedious.



### Of the best Season for employing the Kreuznach Waters.

In exhibiting pharmaceutic remedies it is but seldom that we have to take into consideration the season of the year at which they are employed, and the same rule holds good with respect to the application of mineral waters. Generally speaking, there is no season, no weather in which their use is forbidden, not even when they are exhibited in the form of baths. The opinion that baths ought not to be recommended for winter use on account of the liability to take cold, is correct only when referable to very warm baths. When the bath is only tepid and the room properly warmed, the patient is not liable to take cold more easily in winter than in summer. In baths of mineral water there is still less danger of catching cold than after the use of common water, inasmuch as the mineral ingredients fortify the skin and render it unsusceptible to changes of temperature. In cases, therefore, in which delay would be dangerous, there can be no doubt of the expediency of not waiting for the summer months before

beginning the course. Should, however, travelling in winter be deemed improper for the patient, it will certainly be advisable, if other remedies are expected to be less efficacious, to employ artificial baths of *mutterlauge* during the cold season, with the view of arresting or retarding the progress of the malady. But when no particular evils are to be apprehended from delay, it is undoubtedly preferable to select the warmer months for the purpose of using mineral waters. Accordingly it is in the summer that watering-places are thronged with visitors, who, from the most various motives, choose this season for performing the journey. For the physician, however, the principal ground of preference lies in the fact, that in the warm season his patient will be able to take most exercise during the treatment, and to enjoy the greatest quantity of fresh air.

If in determining the limits of a bathing-season the situation and climate of a place are to be taken into account, Kreuznach will be found to enjoy a decided superiority in point of duration over many other Baths, as for instance *Ischl*, by reason of its favourable cli-



matic circumstances. May and September are included in the months of the regular season; but our early visitors make their appearance already in April, while in November our latest patients have not yet quitted Kreuznach. With regard to the question, in what months the course of baths is most efficacious, there can be no hesitation in replying, from the beginning of May to the middle of June, that being the period of the year at which the system is most susceptible of medicamental influences, and most disposed to expel morbid matters. Also in very inveterate and obstinate cases which require a long treatment, it will certainly be advisable to commence the course as soon as possible, in order that, after an interruption of some weeks, a second course may be undertaken in the same summer.

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## Duration of the Course of Bathing and Drinking.

One of the first questions usually addressed to the medical adviser is, how long will the course last? It will, however, be as impossible to determine by days the duration of a mineral treatment, as it is that of any other curative method in chronic disease. If the utmost advantage is to be derived from the course, the patient will have to continue it till either his complaint is removed, or symptoms of saturation appear, in which latter case the treatment must cease, even though the cure is not yet complete.

At what period, however, this saturation will occur, depends entirely on the susceptibility of the patient for medicines, and whether his constitution is capable of supporting strong baths. A debilitated organism will require weaker baths and a longer treatment than a more robust constitution. With the latter it will be allowable to bring on the point of saturation much sooner by means of strong baths and a lengthened duration of them, and consequently to terminate

the treatment much earlier. But in the case of a weak constitution it is often absolutely necessary to interrupt the course, in order that the body may recruit its strength and be able to re-act upon the treatment. While a course of six weeks is often sufficient for a vigorous constitution, a very debilitated patient will require three months and more, before recovery or the point of saturation is attained. — In no case, however, does this saturation appear earlier than till after the expiration of six weeks. — It often occurs that the circumstances of patients will not allow of their prolonging the treatment till saturation appears, and in such cases the physician is frequently asked, whether a shorter treatment will have any effect, whether saturation is indispensably necessary. The reply is, that a treatment of a few weeks will not remain without beneficial results, but that the greatest advantage cannot be obtained without awaiting the point of saturation. For in every bath the resorption of a certain portion of the ingredients takes place; and each individual bath has, therefore, an effect on the organism. This action increases with the number of baths, and in pro-

portion as the patient approaches the point of saturation.

In general, the treatment at Kreuznach is of longer duration than at other watering-places, and this is easily explained by considering the character of the cases for which our waters are indicated. As we have already seen, they are those in which not only strongly marked morbid symptoms are to be eliminated, but where the whole constitution has to be changed, in order to prevent relapse and to annihilate the disposition to disease; or, they are such as present diseases in the structure of organs and indurations which are often of many years' standing, and have been treated with the most energetic remedies, but without a successful result. The statement will, therefore, not excite astonishment, that in many instances, a single season by no means suffices for the attainment of the object in view; and that to effect a radical and permanent cure, the treatment must be repeated for several successive summers.

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## Rules for the internal use of the Kreuznach Waters.

If there are no circumstances to prohibit the internal application of the waters, and if the patient be not too much affected by the exertion of the journey, the treatment may begin immediately after arrival. The efficacy is greatest when the water is taken fasting, and the earlier hours before breakfast are preferable for the purpose. At no other period are the digestive organs so disposed to act on medicaments and to receive them into the mass of the fluids. In summer, therefore, the morning hours are to be chosen for drinking the water; and this time of the day would be preferable, were it only selected in order to avoid the heat. Persons who have not been accustomed to early rising are strenuously advised to conform to this rule, and not to allow themselves to be deterred by the weariness which, in the beginning, will result from the change of habit. Even nervous constitutions soon get accustomed to quitting the bed earlier than usual, and in a very few days become sensible of the beneficial

influence of the morning air. Should the weather be inclement, the water may be drunk later and at home; for the Kreuznach water does not decompose itself so soon as other mineral waters, and this quality renders it unnecessary to drink the water immediately at the spring. Not till several hours have elapsed after the fluid has been taken from the well does a change commence to take place; a portion of the iron is separated, and precipitates itself in the form of a yellow deposit.

When the physician prescribes that the water is to be drunk at the spring, it is only in order to procure for his patient the advantage of a morning walk. This exercise, in itself, promotes the success of the whole treatment, but is not to be regarded as particularly contributing towards the digestion of the water. As we have already observed, this mineral is so very easily digested, that it is borne with facility by the weakest stomach, and patients whose complaints do not admit of their taking exercise, drink the water in bed or on the sofa with the most satisfactory results. On the contrary, it is perhaps more necessary to caution

the patient against too much exercise whilst at the spring in the morning, and to advise him not to continue his walk till he is fatigued. Should there prevail such an aversion to cold beverages that the water of the *Elisen* spring by its coolness produces a disagreeable feeling in the stomach, it will be proper to add a portion of warm milk to the mineral, or to place a glassful in a vessel of hot water. On cool rainy days it will be advisable thus to warm the mineral water also for less sensitive stomachs, which during the usual summer temperature, do not experience any inconvenience from its coldness. If the spring at the „Salinen“ be used, artificial warming will not be requisite, on account of the higher natural temperature of this water.

Patients whose constitutions forbid the use of iron even in small doses, may let a bottle of the water stand over night, in order that the iron may have time to precipitate. This takes place in ten or twelve hours, whilst the other components remain in the same state as before. By the loss of the iron the water is by no means rendered less digestible.

With regard to the quantity of the dose,

it will be the business of the practitioner to adapt it to the age and constitution of the patient, as also to the stage of disease and the individual susceptibility to the operation of medicines. In every case, only small quantities ought to be taken at the commencement, and these are to be gradually increased to larger doses. But whatever may be the quantity prescribed, it is not to be drunk off at once, but to be taken in small portions at intervals during a period extending from half an hour to an hour and a half. Between each portion ten minutes or a quarter of an hour ought to elapse. The quantity of the doses is prescribed by ounces, and the glasses used at the spring are constructed accordingly, with the separate ounces marked on them. The maximum of the whole dose varies from four to twenty ounces; but in no case should the quantity be so great as to cause diarrhœa. When this takes place, the effective ingredients of the water are not resorbed into the blood, and have no opportunity of developing their peculiar action on the organism. Thus, an increase of stools will generally indicate the point beyond



which the dose may not be carried, and it will then be incumbent on us to diminish the quantity by several ounces. It is, however, not to be supposed that the doses are continually to be augmented till diarrhœa ensues. Where there is great inactivity of the intestinal canal, it would require very large quantities to produce this effect, and were the number of beakers to be increased till diarrhœa appeared, too great a portion of the other effective ingredients would be introduced into the body, and act injuriously on the organism. Unfortunately, the erroneous belief is but too prevalent; that a mineral water is only then efficacious — when it operates as a purgative, and that in this way alone can acrimony and morbid matters be expelled from the system. It cannot therefore be too often repeated, that the Kreuznach water is not to be considered as an aperient; and, that when employed so copiously as to excite diarrhœa, it not only loses its peculiar effect on the organism, but by disturbing the digestion proves positively injurious.

In most cases it will be sufficient to take the water only in the morning; with patients,

however, who are naturally weak or who are greatly debilitated by their disease, it will be better to divide the dose which a more energetic organism would bear at one time, and to let the second portion be taken either an hour before dinner, or in the evening. In the latter case the indispensable condition must not be lost sight of, that the process of digestion must be completely terminated and that for three hours no food of any kind should have been taken. This second dose is, like the first, to be distributed into several portions, and should the time at which it is usually drunk happen to interfere with a walk or drive, it will be advisable to be furnished with a small bottle of the mineral and, at intervals, to drink the contents during the excursion.

The question is often put to the physician, whether the Kreuznach water be not injurious to the teeth, and whether it would not be prudent to drink it through a glass tube. Now, the analysis of the water shows that the teeth cannot be affected by it in the least, and experience fully confirms its innocuousness in this respect.

In many watering-places it is customary at the middle of the treatment to reduce the dose to the quantity prescribed at the commencement. Every rational physician will, however, join Prof. *Heyfelder* in stigmatizing such a proceeding as unwarranted equally by theory or practice. This distinguished practitioner says: „if the employment of a remedy, whether pharmacetic or belonging to the class of mineral waters, produces evident signs of recovery, nature requires us to dispense with medicine entirely. But, if such signs do not manifest themselves, there can be no rational grounds for diminishing the dose and making, as it were, a retrograde movement.“ The physician, carefully considering the individual constitution of his patient and the operation of the water during the course, gradually increases the dose to the quantity that seems to him necessary, and at this maximum, particular circumstances excepted, the dose remains till either a cure is effected or saturation supervenes and prescribes the termination of the treatment. Among the exceptional circumstances alluded to, that demand a temporary diminution or interruption of the dose, we are to reckon

every accidental indisposition of the patient, disturbances of the digestive functions after dietetic deviations, inclination to diarrhœa after a slight cold, etc.

The internal use of the waters during the menstrual period will depend upon individual circumstances. The general rule is, that if there be perfect regularity in the discharge, an entire discontinuance of the waters need not take place. Only, as at this period the system is more sensible than usual of the effects of medicaments, it will prudent to diminish the doses. But if the catamenial discharge be attended with pain or any indisposition, it will be advisable to discontinue the internal application entirely.

With respect to the propriety of employing pharmaceutic remedies during the treatment, in lieu of the mineral water, the writer of these pages feels himself bound to express an opinion opposed to such a proceeding, as also to the exhibition, simultaneously with the water, of other means calculated to act directly on the disease, for the removal of which the mineral treatment was undertaken. This latter can always be adapted to the stage and intensity of the disease,

so as to require no assistance from pharmaceutical remedies. Even in cases of slight indisposition, when the patient is in the habit of employing medicine without consulting his physician, we would advise the utmost caution. An English physician says: „No medicine unless ordered by the medical attendant ought to be taken during the course of water; dinner and anti-bilious pills, as they are commonly called, ought particularly to be avoided. The use or rather abuse of such drugs, to which our countrymen are so notoriously addicted, is at all times detrimental to the enjoyment of health, but in conjunction with mineral waters, they are totally inadmissible; in all instances they interfere with the action of the water.“ In persons subject to torpidity of the bowels the inclination to costiveness, if it be not a consequence of the complaint for which the waters are employed (in which case its disappearance follows improvement) will remain unchanged during the treatment, especially if the patient has been accustomed to the use of aperient medicines. In such instances, as regularity in the stools is of the utmost importance for the general health,

it will be proper to promote digestion by means of aperients. For this purpose such medicines are to be chosen as agree with the mineral water, — according to circumstances, rhubarb, Epsom salts, or Sedlitz powders. — In very inveterate diseases of the skin and in cases where an other dyscrasia is combined with the scrofulous disease we frequently make a pause in the treatment after several weeks, and during this interval employ such pharmaceutic agents as are capable of enhancing the activity of the secretory organs, ex. g. Sarsaparilla, or decoctions in which it is the chief ingredient; this, however, is not done with a view of operating directly on the disease, but with the intention of seconding the effect of the water, and of facilitating the expulsion of the acrimony which has already been set in motion and prepared for excretion.

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## Rules for Bathing.

It is of very rare occurrence, that a patient whose complaint requires the waters of Kreuznach, is confined to the drinking treatment alone. Sometimes, however, it takes place in the extraordinary cases, in which a patient testifies an invincible repugnance to bathing, amounting to a veritable idiosyncrasy. My experience has furnished me with but one case of this nature, in the person of a highly nervous female. \*) A rule observed in many watering-places, — to let the patient take the waters only internally for a time, and to wait till the digestive powers are regulated before employing the bath, — is not applicable to Kreuznach. The rule in ques-

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\*) When children, indeed, who have never bathed in their lives, at the first trial utter the most piercing shrieks and are not to be pacified, their friends are easily led to consider this aversion as a constitutional peculiarity, and to declare to the medical attendant that it is impossible to carry out a bathing treatment. The writer, however, has always found that every child can be brought to submit quietly to a bath, provided it be not too suddenly immersed, but at first only washed in the bath, which must not contain much water; the child will then soon gain confidence and its attention being in some way or other engaged, more water may be allowed to run in.

tion is founded on the idea, that by such a course of proceeding congestions to the head are avoided. But, as before stated, if the temperature of the bath be properly regulated, congestions to the head need never be apprehended. \*) Another rule, equally inapplicable here, is, not to take the bath till the mineral water previously drunk shall have been followed by a stool. This method, too, aims at preventing congestions, and, in addition, is supposed to possess the advantage of rendering the skin more disposed to receive by resorption the ingredients of the bath. Accurate and numerous experiments by weighing before and after the bath, made by the author of these pages in such a manner as to enable him to draw a conclusion, have fully demonstrated that the opinion referred to, which is quite unsupported by experiment, is totally erroneous. There is another rule, however, the observance of which cannot be too strenuously recommended, namely, *not*

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\*) This statement is at variance with the opinion contained in my former work on the Baths of K. Experience has since fully convinced me that the opinion in question was not correct.



*to bathe immediately after a meal.* At such a time our baths, are not positively dangerous, when taken at the proper temperature, but the bather is very apt to experience a disagreeable feeling of fullness in the pit of the stomach and of contraction about the chest, arising from the mechanical pressure of the water on the full stomach, and in plethoric individuals this may occasion congestion to the head, vertigo, and oppression. It is therefore advisable to wait till the digestive process is terminated. It is generally adduced as the chief motive for this observance, that the resorptive activity of the skin decreases in proportion to the greater activity of the organs of digestion. According to the experiments to the writer, this assumption is ungrounded\*). Let the patient, then, either take his bath before breakfast, as soon as he has drunk his prescribed dose; or, let him breakfast half an hour or an hour after drinking the water and not bathe till an hour and a half or two

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\*) In my earlier publication, relying on the prevalent opinion that bathing is the more efficacious the longer the digestive organs have reposed, I stated that the bath was most effective before breakfast. I now consider this opinion incorrect.

hours have elapsed from the time of finishing his meal. Which of these two courses is to be preferred, will depend upon the ability of the individual to remain fasting. Delicate patients, especially women and children, are often much inconvenienced by remaining long with an empty stomach after rising; they soon begin to feel poorly, and are attacked with giddiness, headache, and nausea. With subjects of this description bathing before breakfast will by no means be so efficacious as at a later period of the day, when the general system has more tone, and greater resorptive capability is developed in the skin. For, the resorptive activity of the skin stands, *cæteris paribus*, in exact proportion to the energy of the whole organism. Such patients will do better, to take the bath between breakfast and dinner. In all other cases it may be left to the option of the patient, whether the bath shall be taken before or after breakfast. Should the latter alternative be preferred, the patient should take care not to bathe too near the dinner-hour, and to have sufficient time not only to dress without haste, but also to rest after the bath.

There is yet another period of the day at which the bath may be applied, and that is, in the evening before supper. Theory and practice have shown, that at this time the bath is not less efficacious than in the fore-noon. It is necessary to observe, however, that the patient ought not to be over-fatigued from walking etc. and should not have taken any food for several hours.

In many instances the baths are even more effective in the evening than in the morning, and are therefore to be preferred; this is particularly the case with nervous females. In persons of this description, there is always much more general energy in the latter than in the earlier part of the day; an evening bath will, therefore, be followed by a more vigorous resorption. In this class we may moreover include individuals of a naturally feeble habit, or who are much debilitated in consequence of their complaints; such require a degree of rest after bathing that can only be obtained by nocturnal repose\*).

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\*) I formerly mentioned great irritability of the skin as an indication for evening baths, in order to avoid taking

With respect to the bath-rooms, those are to be preferred which enjoy a sunny aspect, are sufficiently spacious, and from which the bather may regain his own apartment without exposing himself to draught. In the cold season of the year the bath-room must be warmed to a temperature of 68° F.; also in spring and autumn the occasional coolness of a day or two may render a little fire necessary.

One of the most important points connected with the bath is, — its *temperature*. The success of the whole treatment depends mainly upon a correct choice in this respect, and the attention of the patient cannot be too often directed to the subject. On entering the bath-room, therefore, let his first care be, to ascertain by means of a good thermometer, whether the temperature of the water correspond to the instruction of his medical

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cold afterwards. This opinion I now retract. With a suitable temperature there need be no apprehensions of catching cold. Equally erroneous is the statement, that evening baths were appropriate in those cases in which it might be desirable to promote perspiration after bathing by going to bed. Perspiration immediately after the bath is in no case desirable.

adviser \*). The determination of this point ought never to be left to the attendants alone, as even those who are most experienced and conscientious may make a mistake.

The question now arises, how are we to find the temperature suitable for each individual case? It has already been stated, that the most considerable resorption of the mineral ingredients takes place at a temperature that does not affect the pulse; and that the degree of warmth at which this is to be observed varies from 86° to 93° F. Which of these degrees of temperature may suit the individual case, will depend upon the patient's constitution, age, sex, sensibility for changes of temperature, as also on the being accustomed to cold or warm baths, the stage of the complaint, and the general strength; in special cases the degree will differ in consequence of momentary influences, particularly those of the atmosphere. A youthful vigorous body requires a lower degree of temperature for the proposed object, than an

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\*) I allow no thermometer to be used, of the correctness of which I have not convinced myself; or which, if inaccurate, I have not regulated.

aged person; for little children a higher degree will be necessary than for such as are more advanced in age; cold, phlegmatic constitutions demand warmer baths than excitable and plethoric natures. Persons who have been much debilitated by illness require a higher temperature, than those in a comparatively vigorous state. An individual who has never taken a cold bath or has been accustomed to very warm ones, will feel cold in a bath that would be comfortable or even too warm for one who often bathes in the open river or has just quitted a hydropathic establishment. Plethoric and at the same time nervous women feel at their ease only in baths of scarcely 86° F.; a few degrees more have an exciting effect on them. Persons from the South, or who have long been inhabitants of the Tropics, stand in need of a higher degree of warmth, than those who are accustomed to the temperate zones. A bath, that on a hot day was attended with a feeling of comfort, will in cool, rainy, or windy weather appear of a disagreeably low temperature. After great exertion a bath, that otherwise produced a pleasant sensation, will be found cool and

uncomfortable; and the same effect is observed as a consequence of indigestion or depressing emotions. The temperature of the bath will suit the individual case, when the following circumstances are attended to. On first immersion the feeling ought not to be one of comfort, but rather a sensation of shivering; this passes away, if the patient remains quiet, and gives place not exactly to an agreeable but to an indifferent feeling. As long as no movement is made, the patient must feel as if he were not in a bath at all; — the water must appear neither warm nor cold. But as soon as the slightest motion takes place, even a change of position, so that another stratum of water comes into contact with his skin, the shivering sensation ought to return, and induce the bather to remain tranquil in order to escape the unpleasant feeling of sudden chilliness. Again we repeat that it is essential the patient should not feel himself comfortable on first entering the water; should this be the case, he may rest assured that the temperature is too high for him; and even though it may not be warm enough to produce a sense of oppression in

the head, and exhaustion after bathing, yet the effect will not be that of a bath taken at a correct temperature. It will, therefore, be advisable seriously to warn the patient not to give way to the first impression, and to abstain from immediately adding warm water in order to enjoy a comfortable sensation. Not till he has been several minutes in the bath, in a *state of quite*, may it be assumed by the continuance of the shivering, that the temperature is too low. He may then by turning the cock admit such a quantity of warm water as suffices to remove the disagreeable sensation of coolness.

This increase of the temperature after having entered the bath may often become necessary, inasmuch as the sensibility of the skin is, from moral and physical influences (particularly that of the weather) not always the same. Consequently, should the bath have been prepared without due consideration to the momentary state of the bather, he will have to adjust the temperature according to the rule given above. But let him not do this till he has been *several minutes* in the water, and the continuance of the shivering convinces him that the bath is too



cool. — An exception may be made in the case of persons who by nature are exceedingly sensible of cold, or have become so by indulgence, and who testify an unconquerable aversion to a bath that is not perfectly warm; or of such as, in addition to the complaint that brings them to Kreuznach, are afflicted with rheumatism. In these instances it will be proper to give a higher degree of temperature at the beginning, in order that the shivering on entering the bath may be avoided. After having been a few minutes in the water, however, it will be necessary to reduce the warmth to the proper degree, by admitting a supply of cold water. In a very short time the baths will be found to exercise such an invigorating effect on the skin as to render the proceeding in question superfluous, and to enable the patient to bear the proper degree at the very commencement.

The medical adviser, however experienced and cautious he may be, will be able to indicate the suitable degree of temperature on the thermometer only approximatively, and never with certainty. The sensation of the bather fur-

nishes the standard. The best, perhaps the only means of guarding against delusion on this head, is the examination of the pulse and skin *during the bath*. In this investigation the medical man is unfortunately confined to children and men. In the cases of females he must be satisfied with seeing them immediately after the first few baths, and by the appearance of the individual must draw a conclusion as to the correctness of the temperature.

If due attention be paid to these rules, the use of our baths, even when the additions of mother-lye are considerable, will never be accompanied with congestions of blood to the head; nor will it be necessary, even where there is predisposition to giddiness and headache, to wrap cloths steeped in cold water round the head, as often occurs in other Baths.

During the time occupied in bathing the water of course grows cooler, more or less, according to the temperature of the surrounding air. In the heats of summer the loss of warmth, at the expiration of half an hour, is scarcely perceptible; on cool days, however, it may amount to upwards of two degrees F., and if

the bath be prolonged to an hour, to three or four degrees. Besides the influence of the weather, this refrigeration depends greatly upon the individuality of the bather, and varies according to constitution, age, and general strength. With persons of advanced age or enfeebled systems the temperature falls sooner than with those of a plethoric habit or sanguine constitution. Where there is a disposition to erysipelas, the water even attains a higher degree of temperature while the bath is being taken. Generally speaking, if the bath lasts only half an hour, the cooling of the water is not remarked by the bather; and it is, therefore, unnecessary to make good so trifling a loss by turning on the warm water; this will be required only on chilly days towards the close of the half hour, but in baths of longer duration it may be proper also in hot weather.\*) The sensation of chil-

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\* A few words respecting the baths in the *Kurhaus* will here not be out of place. The baths are heated by means of steam; each bath is provided with a double bottom, and into this the steam is admitted, and thus effects the warming of the superincumbent water. This arrangement would of course, were the steam not turned off, not only prevent the bath-water from losing any heat, but would

liness while in a state of quiet will, in this respect, guide the proceedings of the bather.

If, from exercise or any other cause, the patient should have overheated himself, he must be careful to get cool before taking his bath. Should he not observe this precaution he will find the water much chillier than would otherwise have been the case, and will consequently be tempted to increase the temperature beyond that degree which his individuality requires.

From the foregoing observations on the temperature of the water used for bathing the rule may easily be inferred, that the patient ought to be as motionless in the bath as possible.

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even frequently occasion an increase of temperature. Considering, therefore, the difficulty of regulating the warmth of the water by this method of heating it becomes requisite to have the thermometer constantly immersed during the bath, whereby any variation may instantly be perceived. It is, moreover, advisable to ascertain before entering the bath, that the bottom is no longer heated and capable of furnishing additional warmth. It may here be remarked, that the advantage expected from this method of heating, namely, that the water would thereby be less liable to be decomposed, has not been realised; theory and experiment prove this. The baths in the *Kurhaus* do not, therefore, merit any preference over those of the bath-hotels or private establishments.

In a bath which, though it suits his case, is by no means one of the warmest, the patient will generally find that the most comfortable way of getting over the matter is, to remain as quiet as he can. It is true, the shivering sensation consequent on a fresh stratum of water coming in contact with the skin when the bather changes his position, is most easily obviated by a few violent movements, and many patients assert that they prefer this course to remaining motionless. When this is really the case, the proceeding need not be forbidden, especially as the size of the bathing-vats precludes the probability of such exercise being carried so far as to produce fatigue.

It would, however, be erroneous to suppose that, by thus continually changing the mass of water nearest the body, a greater absorption of the mineral ingredients ensues. That portion of the latter resorbed by the skin is, by the equable solution of the ingredients in the water instantly replaced, and even were this not the case, the movement resulting from a necessary change of position, would occasion of itself a sufficient renewal of the water immediately round

the body. The result of the author's experiments on this point has been, to prove that resorption through the skin takes place in a equal degree, whether the body be agitated or in a state of quiescence. Motion in the bath is likewise superfluous when made with the view of preventing the additions of mother-lye from settling. The lye does not fall to the bottom, but remains in suspension in the fluid. Its specific gravity is indeed greater than that of the salt water, but in this latter it is exceedingly soluble\*).

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\*) When there are additions of mother-lye, the bather often remarks a sediment at the bottom of the bath, and imagines it to be the lye, which ought to be stirred up that none of its effect may be lost. This sediment, however, is only a mud arising from the dust accidentally commingled with the mother-lye; its weight causes it to settle, and it is perfectly unoperative. The dust, that has got into the salt water of the reservoirs in the works, after the evaporation of the fluid remains in the lye and gradually sinks to the bottom. If, therefore, the mother-lye used for the bath should happen to be taken from the bottom of the reservoir, it will contain a portion of mud, and is then no longer as transparent and liquid as oil, but turbid and thick. — It may here be remarked that this difference of appearance not unfrequently leads the bather to suspect adulteration, and we sometimes hear a patient say, at length he has obtained a really strengthening and consistent mother-lye, while what he formerly used was thin, clear, and probably diluted with water. The writer has repeatedly tested the

The peculiar nature of the Kreuznach baths, renders the employment of friction with brushes or woollen cloths in the bath quite exceptional. Only in cases of great cutaneous insensibility can they be applied with advantage, at the commencement of the treatment. But if, when mother-lye is added, the skin were irritated by friction, the consequence would be that the prickly sensation, which in most cases must serve as a guide for increasing the adjections of mother-lye, would occur much earlier than when the skin is not rubbed; and the augmentation of the additions would have to cease sooner than the constitution of the patient naturally required. It is moreover to be mentioned that the author's experiments have satisfactorily proved, that the skin irritated by friction does not possess greater resorptive capability than before.

It sometimes happens that individuals express apprehensions of being infected by means of

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mother-lye in a number of bathing establishments by means of an araeometer, and has never discovered the least adulteration; — which indeed with the present facilities of discovery it would be hardly worth while to attempt.

the baths. On this head the most positive assurance may be given, that infection is impossible under any circumstances; for the ingredients of the water, especially the bromine, instantly neutralise all animal infecting matter. It may, in addition, be observed that the diseases in which the waters of Kreuznach are employed, are not of a contagious nature. Should, however, the most careful scrubbing and washing of the bathing-tub not satisfy the doubts of the patient, let him have the inside of the bath covered with cloths, so that while bathing his body may not come into contact with the tub itself.

The use of a bathing gown may be left to the option of the bather; but it ought to be made in such a manner as to be easily thrown off on quitting the bath. With regard to the effect of the water, it is perfectly immaterial whether a dress of the kind in question be worn or not.

It is advisable not to let the hair of the head become wet in the bath. The ingredients of the water, particularly the large quantity of muriate of lime, possess the property of attracting



the moisture of the atmosphere. On drying the head these saline constituents still adhere to the hair; and if there be the least moisture in the atmosphere, in obedience to the laws of affinity it settles on the hair and, making it damp, occasions colds. This precaution is the more to be observed the larger the adjections of mother-lye may be. Should, however, the hair become wet in spite of all care, as is nearly unavoidable with children, the saline ingredients are to be removed by washing the hair with common water after the bath. The use of an oil-skin cap is not to be recommended; it keeps the head too warm, and does not sit close enough to fulfil its object. It will be found, however, that if little movement be made in the bath, the hair will not easily get wet.

The patient's position in the bath ought to be such, that the whole of the body up to the chin may be covered by the water; for, it is only by exposing the largest possible surface to the action of the ingredients that the greatest benefit is to be derived from the treatment. It is also to be observed that a bath of the tem-

perature already indicated, will not make such a disagreeable impression of coolness, if taken in the manner described, as when the neck and shoulders are out of the water. Nervous persons who are unused to baths are, at least at the beginning of the course, unable to support full baths. Even when there is not the slightest disposition to affections of the chest, they are liable to be seized with a feeling of oppression and anxiety. In such cases the tub is to be but partially filled, so that the water reaches only to the pit of the stomach; at a later period the bath is by degrees brought up to the full measure, by which proceeding the patient bears the bath without any inconvenience. The writer has seen cases, especially of children, in which the anxiety and tightness of the chest instantly disappeared on the bathing-vat being covered with a cloth by which the water was in a certain degree concealed from the eyes of the patient.

One of the most important questions connected with the bathing treatment is that relating to the *duration of the bath*. As we have seen, the sanative action of the baths is effected

by the resorption of the ingredients of the water. In proportion, therefore, to the resorptive capability of the skin, the susceptibility to medicinal influence, and to the relative quantity of substances necessary to be absorbed, all of which circumstances differ according to constitution, age, degree of disease, and general strength, — will the length of time allotted to the bath materially vary. With respect to age the rule obtains, that the younger the patient, the shorter must be the duration of the bath; in regard to the strength, the more vigorous the body is, the longer may we allow it to be exposed to the action of the mineral ingredients, and *vice versa*. Phlegmatic constitutions require baths of greater duration than excitable temperaments. As to the inveteracy and stage of the disease, these circumstances have less influence in determining the time the bath is to last, than the state of the strength in consequence of the complaint. For female patients it may be observed that the sex being, as a rule, more sensible to the influence of medicines than men, a shorter period is generally prescribed for continuing in the bath. One of

the principal criteria in this respect is the condition of the skin; the more torpid and inactive this is, the longer may the bath last. Patients, therefore, with inveterate cutaneous diseases, and those, whose skins remain dry even in the hottest weather, will have to continue longest in the bath.

It will be possible to avoid error in determining the duration of the bath, only when we investigate and take into due consideration all the circumstances, individually and collectively, that attend the case. Thus, we shall let a child of a vigorous constitution take a longer bath, than an adult whose strength has been much impaired by disease. — According, therefore, to the various circumstances stated above, the duration of the bath will vary from ten minutes to an hour and a half.

As the susceptibility of the body for the action of medicines diminishes with use, and a remedy that has been exhibited for a length of time loses much of its operative force, the rule follows, with regard to the Kreuznach waters, that in the beginning of the treatment the baths should be of short duration, but are

to be gradually prolonged in the progress of the course. The inverse proceeding is observed only in those cases in which during the treatment the patient's general strength perceptibly improves, and allows a greater re-action of the organism to be expected; moreover, when the skin, which at first was dry and devoid of energy, becomes during the mineral course more natural and affords the presumption of greater resorptive capability.

The patient will, therefore, be enjoined to remain such a period of time in the bath as may be judged adequate to enable the skin to imbibe that quantity of the constituents of the water which may be worked up and digested in the interval of a day. Were he to take several baths in the course of twelve or fourteen hours, and each of the length prescribed for a single bath per diem, an over-excitement of the organism would soon ensue; nor would the most rigorous constitution be able to support with impunity the consequences of such a rash proceeding.

It being, then, possible in the majority of cases to procure the resorption of a suitable

quantity of mineral ingredients in *one* bath, the rule prevails, to take *only one bath a day*. The exceptions can be determined only by the medical adviser. They consist of those cases in which either the skin is in the highest degree torpid and without energy, or when it is so covered with eruption that only a small surface is sufficiently healthy to be capable of resorption. Experiment having demonstrated, that after the first half hour of bathing the resorbing process diminishes in activity and is inconsiderable at the expiration of an hour, under the circumstances referred to above, the period of even an hour and a half would not suffice for the purpose of absorbing the quantity suited to the organism. In such cases, therefore, it will be expedient to let a second bath be taken in the evening, and to continue in this course till such an improvement in the condition of the skin is manifested, as to warrant the assumption that the necessary resorption will take place in a single bath.

In the preceding pages it has already been several times mentioned that, in certain instances, *mother-lye is added to the bath*. The deter-

mination of the quantity of mother-lye is of an importance equal to that of the duration of the bath, and is dependent on the same circumstances. Here, too, only rules of a general tenor can be given, subject to various modifications on account of the age, constitution, strength etc. of the patient. Generally speaking, it may be asserted that the proportions of the adjection are correlative to the duration of the bath. The point beyond which we are not authorized to go, is indicated by a prickly sensation over the whole body or in particular portions of the skin. The feeling in question, however, can no more serve us as a criterion with regard to the external treatment, than can the appearance of diarrhœa when the waters are applied internally. It announces only a limit or extreme, which, in the vast majority of cases, we are not obliged to come up to. For it is to be observed that this prickling occurs at an earlier or later period according to the nature of the skin; where the latter is very insensible, therefore, this local effect of the lye will not appear till the adjections are so strong as no longer to be supported by the constitution and the

degree of disease. A due consideration of all the circumstances of the case, can alone guide us with any certainty. In general, the strength of the bath is determined by the object of the treatment; and the question will be, — whether, the body being diseased from a disorder of the lymphatic system, the curative intention is to restore this last to regularity of function by a strengthening remedy; — or whether, though the said system be in a normal state, indurations and enlargements of particular organs may exist, which are to be resolved by temporary augmentation of activity in the absorbing vessels. In the first-named class of diseases a cure may be obtained by relatively smaller additions of lye, than in the second. The observations offered above respecting the influence of constitution, sex etc. on the duration of the bath, apply with equal force to the regulation of the mother-lye. Thus, these adjections may vary from one pint to forty and upwards; and here it may be allowed again to direct the patient's attention to the danger he will incur, by overstepping the bounds prescribed by his physician. It cannot be too often repeated that the idea



entertained by many, that rapidity of cure is in proportion to the strength of the remedy, or that the baths are productive of a favourable result only when a local effect is manifested on the skin, — is completely erroneous. The consequences of taking baths that are too strong have been mentioned above. — In like manner as, in the progress of the treatment, we shorten or prolong the bath according to the necessity of the case, so do we proceed with the additions of mother-lye, commencing with small doses and gradually increasing the quantity. According to the individuality of the case, we make a *daily* augmentation sometimes of one pint (or even of two), sometimes of half a pint, or occasionally of still smaller a dose. The first few baths are invariably to be taken without any additions, and when these begin, they are gradually increased either till the end of the treatment (i. e. till a cure takes place or saturation puts an end to the course); or, till we are led to expect that the resorptive capability of the skin is enhanced in proportion as the susceptibility of the organism to the influence of medicine diminishes. As long, however, as this

ratio continues to be equal, we retain the maximum of the corroborant adjection and do not decrease till the resorptive capability of the skin preponderates. This occurs when a skin, that was formerly excessively torpid and required some of the strongest baths, has been restored to a normal state; or, when cutaneous affections which covered the greater portion of the body, have partially healed, thereby rendering a larger surface capable of resorption.

With regard to the method of regularly augmenting the quantity of mother-lye up to the middle of the period of treatment, and then diminishing the quantities of lye („abbaden“, as it is called in German), to pure salt water, — what has been remarked above on the number of glasses in the internal treatment, applies equally to the variation in the strength of the baths.

It must be looked upon as a point of considerable importance, that not only the proportion of lye, but also the quantity of water the bathing-tub is to contain, should be precisely indicated. As may be supposed, the difference is material whether the prescribed dose

of mother-lye be added to a bath of 400 or 600 pints. When, therefore, the home physician prescribes the quantity of the additament, he will do well to remember that the bathing-tubs at Kreuznach are smaller than at other watering-places, and at different bathing-establishments are of different sizes\*). The measure of their contents varies between 400 and 600 pints; the average quantity of water for a bath may be taken at 400 pints. For children there are smaller bathing vessels containing from 100 to 200 pints. Moreover, in order to be able to regulate with exactness the strength of the bath according to the proportions of mother-lye, each bathing vessel has been accurately measured and its contents in quarts ( $\equiv$  2 engl. pts.) are marked on it.

The additions of lye require the observance of one condition not demanded by other baths, and this is, that the patient should always bathe in the same quantity of water. If

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\*) Small bathing-tubs have been introduced for the benefit of the less opulent classes, for whom a bath with considerable additions of *mutterlauge* would otherwise have become too expensive.

this rule be not observed, the effect of the bath with equal quantities of *mutterlauge* will on different days be very dissimilar.

As a rule, no remedies of any description are employed during the bath. An exception takes place in female complaints, when *injections* are ordered; these are most conveniently applied in the baths. Sometimes in other cases the use of a *douche* will be requisite. Respecting the employment of the latter a few remarks may be offered, as it is not unfrequently resorted to without medical advice, and yet, when unreasonably used, cannot fail of producing serious injury. The effect of the *douche* is based upon the shock which the jet occasions on the skin and the parts immediately subjacent. Being a violent irritant, it can only awaken slumbering energy, but not produce strength. An essential condition is, that the part to be acted upon by the *douche* should not be in a state of irritation, and still less of inflammation, but should be quite without pain. A second indispensable condition is, that the induration, whether situated in a gland, a joint, or elsewhere, should manifest a tendency to resolve itself, that the depo-

sited morbid matter should be on the point of becoming mobile, and that a vigorous impression may have already been made on the organism by the mineral treatment. When this is not the case, the employment of the douche will only contribute to render the induration more obstinate, and by the irritation it causes, to attract a still greater quantity of morbid matter towards the organ affected. It will, therefore never be proper to use the douche at the beginning of a bathing treatment. With regard to the place to which the douche is to be applied, we must carefully avoid those localities contiguous to the principal nervous plexuses, especially the abdomen, the region of the stomach, and the front part of the neck. At first, a weak jet should be employed, and this but for a short time and at considerable intervals; by degrees the force of the jet and the period of application are to be increased, while particular attention is to be paid, whether or not the affected part is becoming sensible. Should this be the case the intensity of the douche must immediately be diminished, and if the sensibility remains, the douche must be discon-

tinued. One disagreeable circumstance connected with the employment of this irritant is, that when it has to be applied to parts of the body covered by the water of the bath, the patient is liable to take cold, inasmuch as the part to be acted on must be raised out of the water and exposed to the air. This evil may, however be avoided by keeping the part in question under the surface; by this proceeding indeed the force of the jet is diminished in effect, but will nevertheless be found sufficient for the purpose in the cases under consideration.

On *quitting the bath*, it will be best to wrap the body in a large linen cloth that has been previously warmed, to envelop the feet as quickly as possible in warm woollens, and thus to dry the body without haste or over-exertion. As soon as the upper parts are protected against the air, then let the feet be dried. These little precautions are not to be despised; they are certain preventives of cold, which is so easily taken when the feet are for any length of time exposed in a wet condition to the influence of the atmosphere. Moreover, by thus keeping the feet warm the bather will be

exempted from the shivering and disagreeable chilliness usually felt on emerging from a warm bath, and which proceed from the uncovered wet feet, whence they are communicated to the rest of the body. For sensitive individuals who are very apt to take cold, it will be advisable to wrap themselves closely in a woollen bathing-gown *over* the linen cloth, and to wait a few minutes till the linen has imbibed the greater part of the moisture on the skin, after which the body may be thoroughly dried by means of towels.

Gentle friction of the skin with a woollen cloth after bathing, is practised in Kreuznach as well as at other watering-places. It is applied either to the whole body, or to a particular part affected. From rubbing the whole surface of the body the favourable effect will not be so striking, as when only a diseased part is subjected to the operation, especially if the disease should consist of induration of a gland or of scrofulous deposits in the joints. Such frictions become still more efficacious when made with warm oil. But, as is the case with the douche, these applications will act as

auxiliaries in discussing indurations and tumours, only when there is already a resolvent disposition in these; therefore, not till the bathing treatment has had time to take some effect. Were they to be applied at the commencement, not only would they not be productive of a beneficial effect, but might easily prove injurious. This rule, however, is limited to frictions of tumours. Frictions of the whole body may be undertaken at any period of the course, unless forbidden by peculiar morbid conditions.

As soon as the patient has dressed himself, with a proper attention to warmth in his attire, he ought immediately to withdraw to his room and recline for an hour or two on a couch or bed. To the majority this will be a grateful task, as persons who are not accustomed to early rising and walking out are, after bathing, doubly sensible of the necessity of repose. Even for those of a vigorous constitution, who do not feel this necessity, it will be advisable to keep quiet and not to take exercise directly after the bath. Persons who are liable to chilliness and cold feet, will do well to cover up the latter warmly, while lying



down. Children and weakly individuals, or those debilitated by disease, may even be recommended to undress and go to bed for an hour or so. If the bath has been taken fasting, the patient may breakfast during this hour of rest, immediately on his return. If the bath was taken later in the day, and yet the patient on coming home should feel in want of some nourishment, he may have a cup of milk, chocolate, or broth, or an egg boiled soft. This additional refreshment is particularly necessary for children, as with them digestion proceeds much more rapidly than with adults.

Individuals much weakened by illness, and children, often feel an unconquerable desire to sleep after the bath: this inclination may without hesitation be indulged. On awaking, the patient will invariably feel refreshed and invigorated, and will never have to complain of oppression or other inconvenience. These consequences are likely to ensue only when the temperature of the bath was too high. Even persons who are inclined to congestions to the head, or those of an apoplectic disposition, may without scruple take a short nap after bathing, provided al-

ways that the temperature was properly regulated.

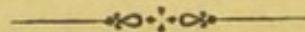
It has already been observed, that *forcing* the treatment by taking stronger baths than those prescribed, cannot fail to be highly injurious; and it must be considered equally detrimental to a favourable result, if the course be irregularly followed; if the patient takes his bath one day in the morning, on another in the afternoon, or, without the most urgent necessity and against the advice of his physician, omits it altogether. In the first half of the treatment such an omission of one bath is, indeed, of less importance, and may even sometimes be permitted; but the more we approach the conclusion of the treatment, the nearer we are to the point of saturation, the more imperative does regularity in taking the baths become, unless the curative plan should require an interruption to take place.

In case of accidental indisposition with febrile symptoms, it will of course be necessary to discontinue bathing. But if the indisposition should consist in a slight cold without fever, a mild catarrh or sore throat, no inter-

ruption of the bath need be enjoined, especially if the weather be fine.

Disturbances of the digestive functions unaccompanied by fever, and diarrhœas that are not attended with pain, by no means require an interruption of the bathing course, though the internal use of the waters must be discontinued for a time. In all these cases, however it will be necessary to increase the warmth of the bath by one degree.

During the period of menstruation prudence requires us to discontinue the bath entirely. Almost every unprofessional person is aware of this rule, and it will scarcely be necessary to direct the patient's attention to the subject.



# RULES TO BE OBSERVED

WHEN INHALING THE

## SALT-AIR NEAR THE GRADUATION-WORKS

OR THE

VAPOURS OF THE MOTHER-LYE.

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On approaching the salt-works\*) the visitor will soon become aware of a peculiar odour, arising from the evaporation of the saline water and bearing a great resemblance to weak vapours of iodine, or to the sea-air. By the trickling of the fluid through the filtering frames of the

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\*) The water as it issues from the springs, contains but  $1\frac{1}{2}$ — $2\frac{1}{2}$  pro cent of common salt. In order to concentrate it, the fluid is made to filter through frames filled with fagots of twigs (graduation works) and trickling through these repeatedly, the salt-water becomes each time more concentrated. After seven filterings it contains 16—18 p. cent of salt, and is then subjected to evaporation in the salt-pans.

salt-works and the draught continually passing through these frames, the surrounding air is impregnated with minute particles of the ingredients of the water. On dry and windy days this impregnation is so extensive as to pervade the whole valley (Salinenthal), and to be perceivable by the smell in the immediate vicinity of the town. Even the perfectly healthy respire this air with a pleasurable sensation; the chest expands and seems called upon, as it were, to make deeper inspirations. In several forms of affections of the respiratory organs, this impregnated air may be said to constitute a real curative agent. The cases alluded to are those in which the mucous membrane of the pectoral organs is affected by scrofulous morbid matter, or in which the mucous secretion of the bronchi and the windpipe is augmented, and the consequences, — chronic catarrhs exist. Even where in the cellular tissue deposits of glandular matter, unaccompanied as yet by any destruction of the pulmonary substance, have taken place, the curative effect produced by breathing this air has been frequently demonstrated. The same may be said with regard to those cutaneous

eruptions that indicate the employment of the Kreuznach waters, and which have spread to the respiratory organs; or where cutaneous disease by the untimely use of repellents has been driven into the body and has thrown itself on the organs referred to. The efficacious constituents of the saline water are by the proceeding in question brought into direct contact with the affected part, and the deductions of theory are confirmed by experience. — The effectiveness of the internal and external treatment is materially enhanced by the operation of the saline air. Its beneficial influence is soon felt by the patient; difficulty of breathing and expectoration are relieved; the secretion of mucus, and with it the cough, is diminished.

Long walks, railed in, lead on both sides, along the filtering frames and by the troughs destined to receive the salt water that has dripped through. The patient is either to promenade up and down these walks or to respire the invigorating air, while reposing on one of the benches that are to be found there. The preference is to be given to the side exposed to the sun and at the same time protected from

the wind. On this sheltered side there is the double advantage of not being incommoded by the wind, and of inhaling the greatest portion possible of the saline ingredients. The difference in the positions of the graduation-works enables the visitor to combine these conditions\*). How often these walks are to be visited in a day and what length of time each promenade is to occupy, will depend on the degree of the affection, as also on the patient's constitution and susceptibility to medicamental influences. It will, in like manner, devolve on the medical attendant to determine whether, at the commencement of the general treatment, it will be better to confine the patient to a part of the works where the air is not so strongly im-

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\*) One of the graduation-works situated on an eminence has been thought unsuitable for the purpose under consideration, on account of the draught from the neighbouring ravine; the side, however, towards the *Salinenthal* is almost always protected from the wind and exposed to the sun during the greatest part of the day.

In rainy and damp weather, there is no *peculiar* benefit to be derived from visiting the works, as on such days the evaporation is very trifling. But far from a resort thither being injurious in the weather in question, the roofs and walls of the filtering frames furnish an excellent covered promenade for exercise on rainy days.

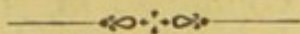
pregnated with mineral ingredients; and this with the view of eventually proceeding by degrees to the inhalation of a more concentrated saline atmosphere. As the graduation buildings are divided into compartments, in each of which the salt water is filtered in gradually stronger concentration, it is rendered possible for us to select that degree of mineral impregnation that may suit the particular case we have to treat. On very windy days the evaporation is so strong and the air on the lee-side of the frames so charged with saline particles, as in a short time to render damp the clothing of those who make any stay in the immediate vicinity. This circumstance makes it difficult to avoid taking cold; therefore on such days the patient is advised to keep during the walk at a greater distance from the frames than usual. But, above all, the patient ought to shun, as particularly injurious, standing for any time on the covered walks of the works, and still more, taking rest on the benches there, which one is strongly tempted to do by the refreshing coolness of the air. Violent colds from this cause are so frequent that



caution on the above head cannot be too strenuously urged.

An effect similar to that of inhaling saline air is produced by respiring the vapours of more or less concentrated mother-lye. A shallow open vessel is exposed to the flame of a spirit lamp, and with this apparatus the vapour is generated in the patient's room, according to the requirement of the case, either whenever he is at home or only a few hours in the day. The quantity of salt water or *mutterlauge* necessary for the purpose, will be determined by the size of the apartment. In no case, however, ought the vapour to be so strong as to produce a sense of oppression in the head or to occasion coughing.

It is not to be recommended that a patient should inhale the vapour of the salt-pans, the heat in the boiling houses being so great as easily to cause profuse perspiration, and to render the utmost precaution requisite, to avoid taking cold on coming into the open air.



## REGIMEN DURING THE COURSE.

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It will be generally conceded, even by those who do not observe the maxim, that a suitable regimen is of the utmost importance for the preservation of health. It is equally unquestionable that, in case of illness, the importance of observing the regimen prescribed is greatly enhanced, and that, in fact, the success of a medical treatment must materially depend upon the strictest regularity in this respect. The physician, indeed, sometimes succeeds in removing a disease in spite of the infringement of his injunctions; but there can be no doubt, that his remedies would have acted more effectively and more speedily, had the conditions of regimen been duly fulfilled. If the patient, therefore, wishes

to derive speedy and certain advantage from a bathing treatment, he must conform to the regimen prescribed by his medical adviser, with the same conscientiousness as he would to the rules for using the waters themselves. This condition becomes of course indispensable, when the sufferer's disease is of such a kind as is proved by experience to be wholly insensible to the operation of medicines, *if the strictest regimen be not observed*. We may here remark, that the greater part of the cases sent to Kreuznach are attributable to diseases of the class referred to.

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### Dietetic Regimen.

In determining the diet to be enjoined during a treatment at these baths, it will be necessary for us carefully to distinguish between the rules that are demanded by the peculiarity of the remedy or the method of treatment, and those prescribed by the nature of the respective disease. If, therefore, certain enjoyments and delicacies are forbidden during the continuance of a

mineral treatment, the reason is either, that they do not agree with the water, or, because their indigestibility easily gives rise to disturbances of the digestive function, and weakens the reaction of the organism on the remedy employed; — or again, we prohibit these indulgences, because they are incompatible with the nature of the disease under treatment, or with the patient's constitution. Certain dietetic limitations will therefore be applicable alike to all those who use the waters internally and externally at the same time; but with respect to the nature of the patient's disease and constitution, both in regard to quantity and to quality, the diet will be adapted to the individual case. If the water be not taken inwardly, the prohibition of course disappears with its cause, provided always (as is generally the case) the enjoyments in question are not forbidden by the nature of the disease. It occurs but too often, that this discrimination in the diet is overlooked; and misunderstandings arise, which lead patients to imagine that medical men are not of one opinion on the subject, or that individual practitioners are strangely inconsistent, strictly for-

bidding to one what they allow or even recommend to another.

As incompatible with the mineral waters are to be regarded, — all kinds of food and all beverages that contain acetic acid or free vegetable acids, therefore all sorts of salad, vegetables and ragouts prepared with vinegar or citric acid; fruits, even when ripe, if they contain a free acid\*), lemonade, and wines pos-

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\*) An idea prevails that acid fruits agree with the mineral water, provided they are boiled. This is erroneous; the acid is not destroyed by boiling, on the contrary, it becomes more prominent thereby, and however much it may be sweetened does not fail to act injuriously. — The fruits that do not possess the above quality and may therefore be allowed, are: *sweet cherries, mirabelles, green-gages, peeled apricots*, (the skin alone contains acid), *prunes*, the better sorts of *pears, oranges, grapes*, provided they be all *perfectly* ripe. In some works on Mineral Waters the above mentioned fruits will be found in the list of prohibited articles; the real motive for this prohibition is, to secure the patient from the danger, so difficult to avoid, of eating a fruit imperfectly ripened. On this ground, the writer of the present pages forbids the enjoyment of strawberries, a most salubrious fruit when ripe, but almost always brought to table with such as are in an immature state. The same may be said with regard to grapes, especially in the first period of their ripening, when persons who do not reside in a grape-country are apt to consider the fruit ripe from its agreeable taste, though it may be far from having attained full maturity, and will consequently act as injuriously as any other unripe fruit. —

sessing free acid. The consequences of indulging in such articles of food are, tension of the stomach, flatulence, colic and diarrhœa. These symptoms manifest themselves either soon after enjoyment, or on the following morning after having drunk the mineral. Exceptions of course occur, where the stomach is sufficiently vigorous

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Sour milk may be allowed to those with whom it generally agrees and who do not complain of acidity of the stomach. The mineral water shows no repugnance to this food, but the addition of cream must be regulated by the digestive power. When sour milk produces colic or diarrhoea, it is generally in consequence of having been taken too cold while the body was heated.

It will here be proper to make mention of an article of nourishment respecting which the erroneous opinion prevails, that its use is incompatible with that of the Kreuznach mineral water; we allude to *potatoes*. On theoretical and on practical grounds there is no good reason why this vegetable should not agree with the mineral-water. The prejudice may be ascribed to the generally known fact, that the potatoe in common with all mealy food is injurious as the *preponderating* diet of scrofulous constitutions. It is the *excess* that acts perniciously, for the elements of the potatoe, in *proper quantity*, are just as necessary for our patients as in other cases; and there are no valid grounds for giving a preference to other vegetables containing the same elements, while the potatoe in a healthy and mature state belongs to the most easily digestible kinds of food. The objection raised even by some medical men, that this vegetable is injurious on account of its solanine may be set aside by the fact that this highl poisonous principle exists *only* in the germs of old potatoes.

to counterbalance the injurious effects of the prohibited article; but the consequences that usually attend such infringements of diet, even when the patient, if not using mineral water, supports acids without inconvenience, afford sufficient proof that these indulgences are not indifferent, though their operation may not manifest itself immediately.

As to the general limitations of diet which we are obliged to impose on the patient, in order that the mineral course may not suffer any interruption or disturbance, they may all be comprised in one word — *Moderation* — temperance in the enjoyment of food, both with respect to quantity and quality. With regard to quantity, the aliment must be proportioned to the individual requirement of the system and the digestive power. The standard will be furnished by the natural, real appetite, as distinguished from the artificial and imaginary. Perhaps the surest sign of a natural call for food is when the appetite directs itself to really nourishing viands and not to mere dainties or piquant dishes. Another condition, almost indispensable to a really wholesome meal, is not to

partake of a variety of dishes; the novelty of the taste continually acts as a provocative. Two, or at most three dishes, in correct proportions of animal and vegetable food, are all that the organism requires.

With reference to quality, the invalid will avoid all kinds of nourishment that, in themselves or by the way they are prepared, are difficult of digestion, and which when taken in the smallest quantities are apt to produce, — in not very vigorous natures, — tension, acidity, and cramps of the stomach; and even in case of strong digestive powers and perfect health, require great exercise and exertion to digest them. Among such aliments may be enumerated: fat meat in general, and especially fat pork, mutton fat, and sauces prepared with it\*); roast

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\*) It would be in the highest degree reprehensible to interdict all fat in the preparation of viands. Healthy nutrition requires a certain quantity of fat, and experience has proved that all farinaceous food becomes more digestible by the addition of fat, in *due* proportion. Most easily digested is *butter*. When fresh and of good quality, it needs never be forbidden during the treatment, not even in case of a weak stomach. Bread taken with a moderate portion of butter is more digestible than without. It is incomprehensible that it should be prohibited in some bathing-places, and



geese and ducks, goose liver, and hard-boiled eggs, fish of a rich kind, such as eels, carp, and salmon, pickled meats, rich sorts of cheese, heavy rye-bread, dry pulse, chesnuts, and dry almonds, rich baked farinaceous food and puddings, sweetmeats, containing almonds or butter. It were indeed to be wished, that at watering-places for *real invalids* the tables d'hôte were subjected to some kind of control or inspection in this respect, as by such an arrangement many infringements of diet might be obviated. In the *restaurants*, it is true, some consideration is paid to the requirements of invalids; but in the large hotels this is impossible, as during the season they are frequented by a number of pleasure-seekers, to whom dietary restraints are neither necessary nor agreeable. The patient must, therefore, endeavor to withstand temptation, and let the interdicted dishes pass by untouched. Should he, however, find himself unable to resist seduction, there remains no

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still more so that it should be supposed not to agree with mineral-water. In rich pastry, indeed, butter is injurious; but this is attributable to its combination, and its relative proportion to the mealy ingredients of the composition.

other resource but to dine alone in his apartment, objectionable as such solitary meals may be in many respects. It is worthy of remark, that in the case of children, taking meals in private is preferable to the public table, for here the misplaced indulgence of friends and acquaintances is almost continually counteracting the efforts of the physician.

Let us now proceed to the consideration of those dietary modifications which are demanded by the various forms of the diseases treated in Kreuznach. It has already been stated that, generally speaking these may be divided into two groups, namely, lymphatic diseases, and complaints in which the lymphatic system was not originally affected, but which by the excitement of this system and the consequent augmentation of resorptive activity, may meet with a cure at our springs. If we subject the nature of these diseases and the intention of the treatment to nearer consideration, we shall find that the diet, particularly in regard to quantity, must greatly vary in different cases.

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### Diet in lymphatic Diseases.

It is at present an established fact, that in the treatment of scrofulous disease a strict diet is of far greater importance than the use of medicines. Cures may be, and are effected *solely* by the strict observance of dietary rules; without which, however, the most appropriate and active medicaments will be of no avail. In the malady referred to, there exists a defective formation of the blood, and the consequence is, imperfect nutrition of the body. Medicines are able only to remove the causes of the defective formation of blood, to provide for the efficient digestion of the food presented to the organs, and to make it fit for reception into the blood. To give actual nourishment, to supply the deficient elements of the blood, is beyond the power of pharmaceutic remedies. This can only be effected through the nutritive process, and by means of well-digested food of appropriate quality. In lymphatic diseases the blood is deficient in those elements which are supplied by substances containing nitrogen, such as

meat. From the nature of the disease we may therefore conclude, that animal food is the most suitable, and experience has fully proved the correctness of the assumption. Animal nutriment *alone*, however, would be highly injurious for patients of this description. They, like persons in health, require a certain proportion of the elements that are to be found in vegetable substances. A diet composed exclusively of animal food, would ruin the organism; nothing but the most arduous bodily exertion could obviate its evil effects. A combination of animal and vegetable food is a condition indispensable to perfect nutrition: only, in lymphatic disease the proportions are different from those required in health. In our climate the proper proportion of food containing nitrogen i. e. meat, to that which contains carbon i. e. vegetables, may be taken as 1 : 4; — a proportion that is found in bread; in scrofula, however, experience has shown, that the ratio should be as 1 : 1½ or 2; — a proportion which Nature presents to us in milk. — When scrofulous disease is developed to a considerable degree, we generally find the digestive powers prostrated, and

all the organs of this function in a more or less morbid condition. It will, therefore, be incumbent on us to select such articles of diet, as combine the most nutriment with the greatest facility of digestion; for only digested food can furnish a healthy blood and contribute to the nourishment of the body. Accordingly, the quantity of food must stand in due proportion to the individual power of digestion; taken too plentifully for the relative strength, the most appropriate nutriment will prove injurious. Nutritiousness and digestibility are not always combined in aliments. Rye-bread, for instance, and pulse are nourishing, only when the digestion is vigorous. Hence, we often have to prefer less nutritious food, but which is more easily digested. The aliments cited above as difficult of digestion, had therefore better be *entirely* avoided by the patient. In milk, and principally in cow-milk, provided they be taken from well-conditioned animals, we meet with all the requisites for the diet of lymphatic patients, a due proportion of nitrogen and carbon with preponderance of the former, facility of digestion, and nutri-

triousness<sup>\*)</sup>). To make milk, however, constitute the sole nourishment, for any length of time, not only of adults but even of children, after

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\*) A strong prejudice exists even among professional men against the use of milk in lymphatic diseases, and some have gone so far as to condemn it decidedly. It is said to relax the stomach, to produce an undue secretion of mucus, and to cause acidity in this organ. But, it relaxes i. e. it does not sufficiently stimulate, only when the digestive organ has been accustomed to the immoderate enjoyment of excitants, and it will be possible by degrees to habituate the stomach to nutriment more agreeable to nature. The supposition that milk causes too great a secretion of mucus is attributable to the fact, that after having been swallowed the liquid covers mechanically the surfaces of the mouth and œsophagus. Acidity is produced only by bad, milk or by such as is just on the point of turning sour; by new or freshly boiled milk it is never occasioned. The assumption that good milk is hurtful in glandular complaints is warranted neither by chymical analysis, nor by professional experience. Milk from diseased or improperly fed cows must of course be considered unwholesome, and instances are recorded of milk from tuberculous cows having produced serofula in children who had not previously manifested any disposition to the disease. To infer from such cases that milk is generally injurious, would be as ridiculous as to prohibit bread, because people have been poisoned by bread containing ergot. In Kreuznach the milk may be drunk without hesitation, as the food of cows in summer, consisting principally of fresh clover, leaves nothing to be apprehended in respect to quality. It may possibly be sometimes thinned with water, and thus be rendered not hurtful, but only less nutritious.

the teething period is past, would be improper. Experience has demonstrated that it is most suitable to observe a variety in diet, and also to choose occasionally those aliments that require mastication, and produce a more active secretion of the saliva so necessary to the digestive process. Cases, it is true, occur, in which a regular treatment with milk i. e. the exclusive use of milk, is advantageous. It is, however, but seldom that this treatment can be persevered with longer than a few weeks, even by adults; an unconquerable aversion ensues, and necessitates a change of diet. Even in those cases in which a partial milk-diet may be judged appropriate, it will be requisite to take into consideration the inclinations of the patient. Should he testify great aversion to this species of food, it will disturb digestion and must be given up. This, however, ought not to be done till we are convinced that milk is insupportable in every form, for it frequently occurs that the beverage is repugnant to the taste only when warm, and that cold, or mixed with Selters water, or taken in a light aromatic tea, it is relished, and agrees with the stomach.

Whenever, therefore, the aversion is not of a most decided nature, it will be advisable to let the morning and evening meals consist principally of milk.

With respect to animal food, we shall of course prefer that which unites nutritiousness with digestibility, in other words, the flesh of the mammalia and of birds. The flesh of old animals is to be avoided as difficult of digestion, while the *bouillon* or broth extracted from it, is to be recommended. Fish, being less nourishing, will seldom be selected (only the fatty sorts of fish are nutritious, but also difficult to be digested). Eggs, in a form that renders them easy of digestion, therefore either raw or boiled soft, cannot be too much recommended.

In the cases in question it will also be our endeavour, in every possible way, to promote an appetite for animal food, or at least to prevent indulgences which might impair it. For this reason, lymphatic children, who frequently manifest a preference for farinaceous aliments, especially if sweet\*), ought to be weaned from such food;

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\*) A degree of injuriousness has been attributed to *sugar*, which must be looked upon as exaggerated. Sugar in itself is



not because it is exactly hurtful, but because it impairs the appetite for meat. Among vegetables we shall choose as easy of digestion, potatoes in moderation, asparagus, spinage, green pease, cauliflower, carrots, scorzonera, rice and sago with bouillon or milk, or else in the form of light puddings; of fruits we allow the non-acid sorts mentioned above, crude and boiled, in moderate quantity. Only good wheaten bread ought to be used, but the total interdiction of farinaceous substances is the effect of prejudice. Sloppy food should be avoided entirely. An essential point in the diet of lymphatic persons is, that their food be properly *salted*. Instinct, which is not to be disregarded, will almost always lead those affected with this disease to take larger quantities of salt \*) than persons

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not detrimental for lymphatic persons; it becomes so by mixture with the other ingredients of pastry and confectionery. When added to aliments otherwise calculated for the disease, as for instance, milk or the yolk of raw eggs, or if taken as sugar-water, not only is it not injurious, but by aiding digestion becomes positively useful. Too large a quantity would, however, produce dyspepsia. It may here be observed that the opinion still entertained by many, that sugar is detrimental to the teeth, has long since been refuted.

\*) Also with respect to salt there prevails the greatest

in good health would relish. A moderate enjoyment of herrings and anchovies is therefore not to be condemned.

The above remarks respecting the choice of aliments are of course subject to various modifications, dependent on the patient's individuality, constitution, habits of life, the nature of our climate, and the season of the year at which the treatment is undertaken. Regarding the influence of these circumstances, it will be well to enter into some detail. Our first consideration is claimed by

a) *The constitution of the patient.*

The *phlegmatic* temperament in which glan-

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prejudice, even among the faculty. The belief that it produces acrimony is not to be eradicated, though theory and practice have demonstrated the erroneousness of the assumption. The circumstance that salted meat, especially pork, aggravates or produces cutaneous eruptions in persons suffering from or inclined to these distempers, has occasioned the belief that this effect is owing to the salt; whereas it ought to be attributed to the quality of the meat and to its fatty consistency. Salt is indispensable to the health of man; it is a constituent of the blood and of many organs, and the continual change of substance requires constantly a fresh supply. If this be not furnished, decomposition of the blood ensues. It is also necessary for the digestion of aliments, especially those of the fatty and mealy sorts, as there are very few articles of food that in themselves possess a sufficient quantity of salt.

dular disease manifests itself in the *torpid* form, in which there exists but slight irritability, with sluggishness of all the systems and especially of the digestive organs, requires the most strengthening diet, the most nourishing meats, strong broths, roast beef and mutton, venison, eggs, together with condiments (of course not in excess). The beverage may consist in water, good strong beer, such as porter and Bavarian beer; during dinner a little good wine, free from acid and not too young, may be taken. The viands ought not to be very fat, as in this temperament there is a great inclination to fatty deposits; for the same reason amy- laceous and saccharine vegetables should be but sparingly indulged in, and rice only with broth. Such patients may be allowed tea and coffee.

In the *sanguine* temperament the erethic form of scrofula is developed. The habit is delicate, the circulation accelerated, with inclination to congestions and ebullitions of blood; the whole organism is highly irritable, the change of substance very rapid. In such patients the appetite is renewed in a short time, therefore frequent but sparing meals will be neces-

sary. The food must here be less exciting, and easy of digestion. We shall prefer the flesh of young animals; roast veal, fowls, pigeons, partridges, sweetbreads, veal and chicken broth, the yolk of raw eggs with or without sugar, and above all, milk, but not too rich. To these we may add light, fresh vegetables, saccharine roots, rice, sago, arrowroot, racahout, cocoa without spices and free of oil; sweet ripe fruit, crude and boiled; the drink should be water, and to decrease the irritability of the nervous system, frequently sugar-water. All exciting things, spices, wine, beer, tea, or coffee ought particularly to be avoided.

The *choleric* temperament, in which the nutritive process is carried on with considerable energy, while the whole organism suffers from enhanced excitability, manifested also in the sanguineous system, without plethora, is but little disposed to lymphatic disease; and consequently, cases of this nature seldom present themselves in Kreuznach. In such instances the diet is a medium between the two regimens already mentioned; more strengthening meats than in the erethic form, rather rich milk,

vegetables, fruit, and much water. All that is heating and exciting must be shunned.

b) The *age* of the patient requires various modifications of the diet. In this respect we may pass over the period of childhood previous to dentition, as such little patients are not likely to be sent to mineral waters. In the age preceding puberty, the diet will be adapted to the constitution and to the digestive powers. A year more or less will demand no great modification in this head. The growing body mostly requires a more generous diet, and in consideration of the quicker change of substance, more frequent meals — perhaps every three or four hours. During the rapid growth that generally accompanies the development of puberty, greater quantities of nourishment become necessary than at any other period of life. At the time in question, however, even for those torpid constitutions that formerly demanded stimulating diet, we must prohibit such excitants as spices, wine, coffee, and tea either entirely, or in a great measure. At a more advanced age, when the energy of the digestive organs has begun to diminish, the diet must be nourishing,

yet easy of digestion, and the viands more or less seasoned. A moderate use of coffee, tea, beer, and particularly of generous old wine is to be recommended.

c) The difference of *sex* does not render necessary any particular modification of diet, *previous* to puberty. Generally speaking, the change of substance proceeds less energetically in the female than in the male; the former, therefore, requires a smaller quantity of aliment, and proportionately more vegetable food. All kinds of seasoning and of exciting beverages are more frequently improper than in the male sex, on account of the far more generally occurring irritability of the sanguineous and nervous systems. Such enjoyments are especially injurious during the period of menstruation. At this time, where the constitution is habituated to tea or coffee, these beverages ought always to be enjoyed in smaller quantity and weaker infusion.

d) The general *mode of life*, particularly with regard to air and exercise, demands a relative modification of diet. Unfortunately, the circumstances of a patient do not always allow

him to take proper exercise in the open air when at home; and the diet will have to be of a less nutritious kind than would be recommended, if the condition of healthy exercise could be fulfilled. During treatment at a watering-place, however, it occurs seldom that a patient is under any restriction with regard to the enjoyment of the open air, and the diet may accordingly be as complete as the individual case prescribes. Modification will be requisite, only when the form of disease forbids active exercise. In default of this, the change of substance proceeds much more slowly than otherwise would be the case; and the digestive function is considerably less active. Consequently, those whose exercise is confined to a carriage airing require less nutritious diet, and in less quantity. — That more or less pedestrian or other exercise produces a corresponding difference in the appetite, which may and ought to be indulged accordingly, need scarcely be mentioned.

e) The *dietary habits* of the patient next claim our consideration. Aliments that in the abstract must be looked upon as hurtful, may

by custom become so necessary to the organism, that we cannot venture to give up their employment at once. This especially holds good with reference to the use of excitants, such as spices, wine, tea, and coffee. Wine, for instance, though improper for the constitution or the disease, may have become so necessary during meals, as to entail digestive disturbance on being suddenly relinquished. The same may be said in regard to the use of coffee after dinner. Where the constitution and the form of disease render these enjoyment, evidently injurious, we must endeavour to disaccustom the patient by daily diminishing the quantity. We must, however, desist from any farther limitation, as soon as the digestion shows the least signs of disturbance.

f) *Modification of diet according to the Climate.*

Climate has much influence on the change of substance. In different countries, therefore, the diet must be different. The more southerly the region, the less is the requirement for food in general, and the greater must be the proportion of vegetables. The purpose of the pre-



sent pages, however, confines our attention to the difference between the general English climate and that of Kreuznach. The mostly cool and damp air of England, especially near the coast, renders nutritious aliment, and above all animal food, absolutely necessary. Ardent and fermented liquors, strong tea, and stimulating nourishment of every description are easily borne; experience proves that a moderate enjoyment of them is the reverse of hurtful, even for plethoric and sanguine individuals. Now, the difference between our climate and that of England is indeed not so great as to call for the precautionary regimen usually adopted on proceeding to southern or tropical regions; nevertheless if, during a stay of any length in this country, the full living, appropriate in England, be continued, even the most vigorous constitutions will soon be made aware of the injurious consequences, but will experience immediate relief on restricting themselves to a more moderate enjoyment of animal food and stimulating liquors. In feeble constitutions or wherever there is a morbid condition, these injurious effects will, of course, be mani-

fested much sooner, and with greater intensity.

g) *Modifications with regard to Season and Weather.*

In summer, the period usually chosen for a mineral treatment, the change or renewal of the substance of the body is less considerable than in other seasons, particularly in winter. The body does not therefore require so abundant a supply of aliment, and the diminished activity of the digestive functions directs our attention to the lightest kinds of food. The decrease in the loss of bodily warmth intimates to us that less quantities of heating liquors are to be taken, than in the cold season; on the other hand, cooling drinks become highly palatable and appropriate. Perhaps the best drink is pure spring water, but for those who entertain an objection to water alone, the juice of some sweet fruit may be added; we may also recommend acidulous water in moderation, Selters water, and ice\*, if taken

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\* Ice is one of the prohibited articles in most works on mineral waters, but the writer of these lines cannot con-

with due caution. Spring and autumn are intermediate periods with respect to the energy of nutrition. The rules that have already been given regarding diet, are adapted to the warm season, inasmuch as it is in the summer months that we are most likely to have an opportunity of putting them in practice at our springs. A sudden, though transient, change of weather may be so considerable as to prescribe an alteration of diet with respect to quality; but to trifling variations of temperature no attention need be paid. Generally speaking, more or less exercise will easily balance any modification of diet demanded by the state of the weather. In the autumnal season, when warm days are often followed by cool evenings, or in cold

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sider it unconditionally injurious. Like every cold drink ice can only become hurtful by too powerful a contrast, i. e. when the body is over-heated; and in such a case is capable of causing the most dangerous inflammatory maladies. Moreover, ice may, on account of some spicy admixture, become improper for persons to whom spices in general are interdicted. When made with cream it disturbs digestion, unless a little white bread be taken at the same time. The use of ice immediately after dinner is reprehensible; its cold effect on the stomach causes the fatty portion of the food to coagulate, whereby the latter becomes much more difficult to be digested.

rainy weather, the patient should be careful not to eat too much fruit. Though dysentery is a rarity in Kreuznach, and never appears epidemically, yet diarrhœa may be occasioned and the mineral treatment be subjected to interruption.

f) *Diet with reference to the period of the Day.*

The warmer the climate, the longer are the intervals at which a demand for nutriment is felt. In the tropics, *one* substantial meal in 24 hours suffices. In our climate, however, more frequent nourishment is necessary. If only one meal a day be taken, weakness of digestion ensues; and by the reception of a large quantity of aliments at once into the body, the blood is too suddenly supplied with nutritious matters. From this, congestions of blood to individual organs and, in case of predisposition, even apoplexy may result. It has, therefore, been found expedient to divide the daily nourishment of adults into one principal and two secondary meals; for children an additional repast will generally be necessary. Even adults, after taking more exercise than usual, feel the

want of a little extra refreshment, and this holds good with reference to long walks during the bathing-course. Constitution, weather, and other circumstances are naturally to be taken into consideration. Whether it be more advantageous to take the principal meal at one o'clock, or at five or six, depends upon habit. During the treatment an early hour is to be recommended for dinner, as the patient will by such an arrangement be enabled to profit by the later and cooler portion of the day in making pedestrian excursions. Should the earlier dinner-hour be chosen, the evening repast will, of course, have to be proportionately substantial, but ought to be taken at least two hours before retiring to rest.

With regard to the choice of aliments for the different meals, the less nutritious sorts are preferable for *breakfast*, as during sleep the change of substance does not proceed so quickly as at other times. Those, however, who have been accustomed at home to a substantial breakfast may still partake moderately of eggs and meat, as it is presumed that during the course an early walk will precede the meal, and also

that no particular circumstances enjoin a sparing regimen. For children, the most appropriate breakfast will be milk and wheaten bread; in case of a dislike to milk, cocoa deprived of its oil may be substituted; for torpid constitutions, acorn coffee and eggs or a little light meat.

The *supper* of adults ought to consist of food that is easily digested, eggs boiled soft, light meats, poultry, mutton chops, veal cutlets and light vegetables. Tea, where custom has removed its exciting effects, and meat may also be employed for the evening repast; but for children and even for adults of a sanguine, excitable temperament, milk and white bread should be preferred. Should a requirement for food be felt between dinner and supper, particularly during a walk, bread and butter with milk may be taken, or even coffee, the possibly objectionable effects of which will be removed by exercise.

Although, as a rule, the treatment of lymphatic disease demands a nutritious diet, yet cases occur, for which during a short period we are obliged to have recourse to a diet the very

reverse of nourishing. This takes place when we wish to stop the progress of a dangerous affection as quickly as possible, by the most energetic means. Practice has demonstrated that every remedy (in our case, the mineral) operates with greater effect, the less the system is burdened with food. This effect takes place at the expense of the scrofulous disposition, and must, therefore, not be of too long duration. We shall unhesitatingly employ the method in question in cases of disfiguring cutaneous eruptions in the face, and particularly in that most destructive form of scrofulous cutaneous disease, *lupus*; and likewise, whenever a complication formed by other dyscrasies obstructs the cure of the lymphatic disease, and must therefore first be removed. This object we shall most speedily attain by the use of strong baths of mother-lye, and a sparing regimen. In extreme cases, we shall even be obliged to resort to a hunger-diet \*), to a limitation of nourishment

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\*) A hunger-diet is not so difficult to be carried out, as is generally supposed. The desire for the usual quantity of aliment disappears after the first few days; the digestive functions fall, as it were, into a slumber, while all the

just sufficient to support life. No rule can be laid down as to duration of such a strict regimen; this will depend upon the effect of the whole treatment, and upon the degree to which it is possible to withdraw sustenance from the body, without acting too injuriously upon the scrofulous disease.

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### **Diet of non-scrofulous Patients during the mineral treatment.**

The dictary regimen for persons free from scrofulous affection will be subject to the limitations common to all who undergo a mineral treatment. In other respects it will have to be modified according to the individual constitution; and one of the main points requiring our attention will be, the state of the digestive organs and the general health, in so far as it depends upon the particular disease. Among this class

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*secreting organs act with redoubled energy. In most instances languor and weakness ensue, but as soon as a more liberal diet is allowed, the patient rapidly regains his former strength.*



of patients we may allude to several forms of female disease, entailing considerable loss of blood. The symptoms of a want and tenuity of blood, the pale chlorotic hue of the countenance, speak of themselves for a nutritious light diet, adapted to the digestive powers. Everything of an exciting nature will have to be avoided. There are, however, other cases where the local complaint, enlargement of the uterus etc., proceeds from a superabundance of humours, but where the evil has not yet made such progress as to be retro-active on the organism. Here a limitation of diet both in regard to quantity and quality becomes necessary; the regimen will be chiefly vegetable, and fatty aliments are to be avoided. By diminishing the plethora and the nutrition, a diet of this nature will not only exert a favourable influence on the complaint directly, but also indirectly by enhancing the effect of the mineral waters. Among this class of patients the employment of a complete hunger-diet is not likely to occur. Induration of the ovaria, or tumours of the uterus will never be subjected to such a regimen on their own account, but only when the existence of other dis-

crasies in the system prescribes this method of cure.

The following observations on regimen, — in the most extended sense of the word, during the mineral treatment, are applicable principally to patients suffering from lymphatic disease. For others the general rules already mentioned, and indeed indicated by common sense, will in most cases prove sufficient. The special rules contained in the subsequent paragraphs and adapted apart from their complaints to all who are under mineral treatment, will easily be distinguished from the rest.

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### **On Clothing, and Care of the Skin.**

Children in whom glandular disease is developed, require warmth, and should be protected by their clothing from any inclemency of the weather. Without being so thick as to excite perspiration on the least motion, the patient must always feel warm and comfortable. The danger of taking cold is best obviated by

wearing cotton shirts, which indeed cannot be too earnestly recommended to those of a lymphatic disposition. In some cases, it may even become necessary to let the patient wear flannel next the skin; and particular attention is always to be paid to keeping the feet warm. It will be better not to let children of a scrofulous habit go too lightly clad, with the view of making them hardy. — A residence in Kreuznach calls for no particular modifications of the above precautions; but it may be observed that the baths fortify the skin, and render it less sensible to the influence of the weather. In the majority of instances flannel can be laid aside during the treatment, and replaced by calico. That very wet and cold days, which though unfrequent sometimes occur here, demand certain extra precautions, will be understood as a matter of course. It is also to be recommended that, when taking long walks in autumn, the invalid should be provided with some additional covering, shawls, paletot etc. in order to be sufficiently protected against the cool air of the evening. — The care and strengthening of the skin, a point that for lymphatic patients is of

still greater importance than for persons in health, is a necessary consequence of the use of the baths. If the patient be accustomed to cold ablutions of the whole body, let them by all means be continued, with due precaution, during the mineral course. When particular circumstances, such as inclination to congestion towards internal organs, or considerable weakness supervene, cold affusion may find an advantageous substitute in dry frictions with flannel or the bare hand, performed just before going to bed.

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### On Residence.

Among the injurious influences considered favourable to the development of glandular disease, confined, damp dwellings surrounded by high walls that shut out air and sun, occupy a first place. The apartments inhabited during the treatment ought, therefore, to be spacious, dry, sunny, and well ventilated. The bed-rooms, in particular, should be of good size, and there

ought never to sleep so many persons in the same apartment, that a vitiated air is perceptible in the morning. It may be remarked, that absurdly enough, in the hotels etc. here, the smallest rooms are generally arranged as sleeping apartments.

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### **On Light and Air.**

In the treatment of lymphatic maladies, the importance of a pure air cannot be too highly estimated. Patients of this description consequently derive peculiar benefit from a change of air. When removed from the insalubrious atmosphere of large cities, marshy grounds, or of a confined valley, a manifest improvement both in the general health and in the morbid symptoms takes place in a short time. The more frequently such beneficial air can be respired, the better for the patient; he should pass as much of his leisure time as possible out of doors, even if it is only on a balcony, or in the garden (with which latter almost all

the houses here are provided). The best airing, however, is that taken in the open country, and the patient is recommended to seek the shade *only* in the very hottest hours of the day. Light and sun are grand promoters of life in all organisms, and particularly so for persons afflicted with glandular disease.

It will hardly be necessary to remark that this enjoyment of the open air must be conducted with a due degree of caution; damp ground and draughts are equally to be avoided.

The advantage of Kreuznach with regard to the specific qualities of its air in lymphatic disease, have been mentioned in a preceding page.

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### On Exercise.

The favourable effect of exercise on the body is to be ascribed to its promoting digestion, and the change of substance throughout the body, as also to its accelerating the respiratory function. The necessity of breathing is enhanced

by the movement of the body; the inspirations become more frequent, and a relatively larger quantity of air penetrates the lungs. The purer this air, the greater is the benefit derived from exercise; hence the importance of walks in the open country. Exercise in good air is universally acknowledged to be a powerful supporter of health; but for lymphatic persons it must be looked upon as an actual remedy. It must however not be forgotten, that favourable effects are to be expected from exercise, only when it is prolonged to the point of fatigue, *not of exhaustion*. For children a slow and measured walk is by no means sufficient; exercise ought not to have the aspect of a task; it must be undertaken with pleasure, and all the muscles of the body called into energetic play. Children ought to be encouraged to amuse themselves in the open air, if possible on wooded grounds, where there is an opportunity for climbing and other gymnastic exercises; all their games ought to require a good deal of running and motion in general, but every excess should be carefully avoided, and the exertion be proportioned to the strength. When the body is over-

heated, due precautions against taking cold ought to be observed. Where there is an inclination to excitement of the blood and to congestions, the exercise must not be too violent: in disease of the heart or lungs, or even where the predisposition exists, running and every violent movement are to be forbidden as decidedly injurious. The more passive exercises of riding and driving are naturally less advantageous, and are only to be recommended in those cases, in which the state of disease prohibits more active exertion. Even this degree of exercise, necessary as it may be for the general health and the primary disease, must be totally given up when the morbid condition is thereby aggravated; as for instance in diseases of the joints, tumours of the knee, and affections of the vertebral column in the inflammatory stage. In such cases, a criterion is furnished by the pain that accompanies every movement. It is, however, often in our power to afford considerable relief by means of suitable mechanical arrangements.

The practitioner is often asked, with regard to children's playing together, if infection is not



to be dreaded from the contact of those who are in a high degree scrofulous. The most positive assurance may be given, that all apprehensions on this score are without foundation; it is beyond doubt that scrofula is not communicable by contact. A few words may here be offered with reference to *dancing* during the continuance of the mineral treatment. Where no morbid condition exists, that in general interdicts all vigorous exercise, for instance, a disposition to palpitation of the heart, a moderate degree of dancing will certainly not prove injurious. Mischief can ensue only from indulging in the exercise to excess, by loss of rest, or by imprudent exposure to the cool air, circumstances which might proceed just as well from other causes.

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### On Sleep.

Salutary as is frequent exercise during the treatment, equally necessary is it that the wearied body should enjoy the proper degree of refreshment by sleep. A patient ought to retire to rest at 10 o'clock — children of course earlier — in order to obtain some sleep before midnight, and to be sufficiently refreshed by an early hour in the morning. It will then seldom be necessary to sleep after dinner, especially if a nap has been taken after quitting the bath. Slumber after dinner, however, is not unconditionally to be rejected. Custom must be taken into consideration, as also whether the invalid feel refreshed after a short nap. Weakly, irritable persons, or such as are debilitated by sickness, particularly children, require a little repose after the principal meal, and on them it acts beneficially. But for phlegmatic and torpid constitutions too much sleep and consequently after dinner naps also, is directly injurious. Persons inclined to congestions to the head are generally so troubled by alarming dreams, giddiness, and a feeling of lassitude or torpor

after these naps, that they soon give up the habit, without requiring to be warned.

With respect to beds, it may not be superfluous to observe that featherbeds are to be looked upon as positively injurious for children affected with lymphatic disease. None but mattresses stuffed with horsehair or sea-weed ought to be used, and all the bedding should be well aired and exposed to the sun every day. The bed-clothes ought never to be so heavy as to produce perspiration during the night. A bad habit contracted by many persons, especially children, is highly reprehensible; it is that of thrusting the head more or less under the bed-clothes, in such a manner as to cover the mouth and nose. Thus air which is no longer fit for the purpose of respiration, is repeatedly inhaled, to the particular detriment of lymphatic patients, for whom a constant supply of pure air is of so great importance.

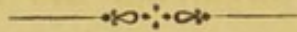
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### Moral Regimen.

The influence of the mind and temper on the organism, and the importance of eliminating violent emotions, especially those of a depressing nature, are circumstances well known to the general public. It consequently scarcely requires to be remarked, that the success of a bathing-course will be promoted in the highest degree by the serenity and cheerfulness of the patient. Unfortunately, it is often not in the power either of physician or patient to control the causes of such emotions. It is but seldom that the medical attendant is able to do more than to relieve the anxiety of his patient respecting the supposed incurability of his disease, and to inspire him with confidence in the effect of the treatment. In the case of children, who seldom know what sorrow is, the practitioner has luckily seldom to contend against moral difficulties of the nature described.

Children affected with disease in a high degree, and who are in a debilitated state, had better suspend all mental application whilst at Kreuznach; and for those who are less affected,

the hours usually devoted to study ought to be considerably reduced in number. This is particularly necessary with talented and lively children. With torpid constitutions, on the contrary, it will be requisite to keep the mental powers in due activity, and to let exercise and play alternate with intellectual employment.



## REGIMEN AFTER THE COURSE.

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The mineral treatment being terminated either by a cure, by saturation, or by various circumstances that may preclude the possibility of its continuance, it is proper that the patient should know what rule of conduct he is to pursue in order to keep possession of the advantages he may have gained, and to derive all possible benefit from the after-effect of the waters. The opinion prevails, that it is absolutely necessary to follow up the diet, prescribed by the peculiar nature of the mineral-water, during several weeks after the treatment; or, in other words, to abstain from fruit and acids. The observance of this rule is supposed to be sufficient for en-

suring the full after-effect of the treatment. But the articles of food referred to, were injurious only by their not agreeing with the internal use of the saline water, and their enjoyment may be resumed on the cessation of the course, unless peculiar circumstances should forbid.

If a cure has been effected, the main object of subsequent regimen will be, to avoid the noxious causes, and by regulating the diet according to constitution, age, and individuality, to endeavour to avoid a relapse.

If the treatment has been carried up to the point of saturation, nature must not be disturbed in her efforts to eliminate morbid matters and to regulate anomalies in the organism. As disturbances of these efforts, however, must be considered all disorders that supervene independent of the original disease. The utmost care will, therefore, have to be employed, in order to prevent the occurrence of any such disorders, colds, and irregularities of digestion; to this end, a diet adapted to the constitution, in the main corresponding to that prescribed during the mineral treatment, will be observed. That those limitations enjoined by the use of the

water, need no longer be enforced, has already been remarked. Neither will it be necessary to restrict the quantity of aliment; this measure was demanded by the treatment, not by the disease. As long as an after-effect of the course may be expected i. e. during two or three months from its termination, the employment of pharmaceutic auxiliaries will be shunned. The use of medicines during this period will be appropriate, only when conditions exist that impede the development of the after-effect. Thus, should torpidity of the bowels continue after the course, and refuse to yield to dietetic means, the exhibition of aperients will undoubtedly be requisite.

Inasmuch as a plentiful supply of pure air, cheerfulness of spirits, and the removal of petty household cares are acknowledged to exert essential influence on the health, the development of the after-effect cannot fail of being materially promoted by a sojourn of a few weeks in a salubrious and attractive part of the country, or by a journey to some picturesque region. Care must be taken to travel in as convenient a manner as possible, so as to avoid injurious



fatigue, and the mineral treatment must have been completed at such a season as to allow a reasonable expectation of fine weather. Long voyages cannot be looked upon as suited to our object; sea-sickness and the confined air of the cabins cannot fail to act detrimentally, and to over-balance the advantages of the sea-air. On the other hand, a residence at the sea-side, on a part of the coast protected from inclement winds and not subject to cold fogs, cannot be too highly recommended for lymphatic patients. If circumstances allow of a permanent change of residence in favour of a warmer climate, this measure should be adopted without hesitation; but the difference of temperature between the two climates must not be so great as to require acclimatisation. For those suffering from lymphatic disease the advantages attending such a change of climate will be the greater, if the site of the former residence was favourable to the production of scrofulous disorders. The banks of the Rhine, Baden-Baden, Switzerland, Italy, and the south of France, are the countries usually selected for the purpose in question. In our choice, however, we

must not overlook climatic peculiarities, as it is not a matter of indifference whether the invalid reside in the mild air of Montreux or at the foot of the Alps; we must not forget, that the air of Pisa acts very differently from that of Nice, and that in choosing a place of sojourn in Italy, the season demands especial consideration. The limits of the present little work will not allow us to enter into details on this subject.

There still prevails a very general belief, that a resolvent mineral treatment requires the subsequent use of corroborants, of sea-baths or chalybeates, in order to recover from the weakening effects of the course. As on this head the most lamentable mistakes are constantly made by self-prescription, a few remarks on these two methods of treatment will not be out of place.

With regard to *sea-bathing*, although it was formerly supposed that its effect was identical with that of the waters of Kreuznach (on account of the common salt they contain), yet in truth the mode of action of these two curative agents is totally different. It is only when

sea-water is warmed and used in a bath, that a certain similarity of effect takes place. But as this fluid contains far less proportions of iodine, bromine, and muriate of lime, its operation must naturally be less intense than such a water as ours. The effect of bathing in the open sea, however, is very different. The body is not exposed a sufficient time to the influence of the water for any considerable resorption of the ingredients by means of the skin to take place. Experiments have proved that in a bath of 80° F., the resorption is very insignificant, and diminishes in proportion to the coolness of the water. The great efficacy of sea-bathing is based on the local impression it makes on the skin and the whole nervous system, both by the saline properties of the water and by the stroke of the waves. Thus, a sea-bath gives energy to the skin, excites and invigorates the nervous system, strengthens the whole organism, and contracts the tissues. This effect may be looked upon as a quintessence of the contracting action of river baths, with a simultaneous douche. It is moreover enhanced by the bather's respiring the sea air, by the

out of door exercise, and by the moral impression which the sight of the ocean never fails to inspire. The direct efficacy of sea-bathing on glandular disease is but trifling. If there exist only the disposition to the disease, if morbid formations have not yet been developed, a sea-bath, by invigorating the whole organism, acts indirectly on the disposition. The system being strengthened, the *vis naturæ* is of course better able to exert itself in counteracting the morbid disposition. But, when glandular matters in any part already exist, sea-bathing must evidently prove hurtful, by increasing the obstinacy of tumours and indurations. In the erethic form of scrofula, in which congestions to important organs easily take place, sea-bathing would in every case be exceedingly improper; and equally so, when the morbid matter manifests a tendency to deposit itself on internal organs, particularly on the tissue of the lungs. Only when, in torpid constitutions, glandular indurations are on the point, or already advanced in discussion, perhaps a more speedy dispersion might be expected from invigorating the whole system by

means of sea-baths. To hit upon the right moment, however, when they no longer tend to consolidate the substance of the gland, is a task of no easy accomplishment. We may therefore assume that, as a rule, in the cases cited above, sea-bathing is improper as a secondary treatment after Kreuznach, and in other cases, unnecessary. It will be advisable only when scrofulous symptoms no longer exist, but where nevertheless, in a torpid or lax constitution, the body requires strengthening; when the discussion of scrofulous deposits has made considerable progress, but is retarded by the indolence of the constitution; and lastly, when, after the morbid phenomena have been removed, independent conditions exist for which sea-bathing is known to afford a possible remedy, for instance, cutaneous sensibility for changes of temperature, and disposition to rheumatism or actual chronic rheumatic affections. The choice of a bathing-place will be determined by the constitution of the patient; it is by no means a matter of indifference whether the strong baths of the North-Sea, or the weaker ones of the Baltic, or those of France be selected. Neither

must it be forgotten that the coast of Great-Britain offers considerable variety with regard to the force of the waves, exposed or sheltered position, and arrangements for bathing.

As to *chalybeate baths*, it is an ascertained fact that they are unable to act directly on scrofulous disorders, and that in the erethic forms, where there is disposition to congestion and inflammation or to deposits on the lungs, they are positively injurious. The laxity of the muscles and of all the textures in the torpid form of scrofula, with the concomitant paleness of countenance, seems indeed to demand the use of iron, but experience has taught us, that as long as scrofulous matters are still in the system, iron is injurious. Glandular tumours and swellings of the joints become more obstinate than ever, by the use of iron, on account of the contractile effect of the metal on the tissues, and either actual indurations are formed, or inflammatory affections ensue. The same observation holds good with regard to indurations and enlargements in the various organs of generation; cases that are very often sent to Kreuznach, as mentioned above. In instances

of this nature we must be very careful not to be led to the employment of iron by the pale, chlorotic hue of the countenance, which is often the consequence of violent hæmorrhages occasioned by the affections referred to.

Even in those cases in which the morbid appearances have been eliminated by a treatment at Kreuznach, — in which no symptoms of scrofula remain, and where the indurations and tumours in the organs of generation have been dispersed, and where accordingly the employment of iron would no longer be directly hurtful, — even in these cases chalybeate baths ought to be used only as an exception. A state of weakness resulting from the cured disease, can be remedied by appropriate diet. A chalybeate is only then to be recommended, when, after the disappearance of the morbid phenomena, for which Kreuznach was prescribed, a chlorotic condition remains behind, either as a remaining symptom or an independent disease.

It is but seldom that a chalybeate bath will immediately follow on Kreuznach in diseases of the generative functions (generally attended with a chlorotic state), for it is not often that

during the treatment here the tumours or indurations are perfectly discussed; this does not take place perhaps for some months afterwards, as an after-effect. And even then, as the chlorotic hue is but a consequence of the loss of blood, after removal of the original disease, a nutritious diet generally proves sufficient to supply the deficiency. For the immediate employment of steel-waters we have, therefore, only such cases left, in which the chlorotic condition is a consequence of physical development and where all symptoms of scrofula are eradicated.

There is yet another secondary treatment which, though much less energetic than the two already enumerated, is adopted as an immediate supplement to Kreuznach, — it is the *grape treatment* \*), respecting which a few

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\*) Only perfectly *ripe* grapes have the desired effect. Those sorts are to be chosen, that contain the greatest quantity of saccharine matter. As a grape-treatment ought to begin as early as possible, in order that the season may still allow of plenty of exercise, we shall prefer those kinds that ripen earliest. The two desiderata of sweetness and early maturity, are united in the Burgundy and the Ruland grape. Later in the season we may take also the Franken



observations may not be superfluous. Its effect is that of a mild resolvent, and it acts more particularly on abdominal obstructions, or conditions that are connected with hæmorrhoidal affections. When such obstructions have been acted upon by a resolvent mineral water, when material morbid matters have already been prepared for elimination, or crises have taken place, — then a grape treatment will be appropriate, in order to second the organism in its excretory efforts. Among youthful patients,

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the Traminer, and the Gutedel grape. The large watery sorts, which strange to say have been recommended by some physicians, are less suitable on account of their ripening late and their poverty of saccharine matter. (This erroneous idea is seconded, or perhaps originated by the vendors, who prefer disposing of those grapes that give the weakest wine). Another error is, that red grapes are not proper for a treatment by reason of the astringent properties of red wine. But the tannin of this wine is a product of fermentation and proceeds from the grape-skins and stones; it is not contained in the juice of the fresh fruit. — The treatment begins with 2—3 lbs. and increases to 5—6 lbs. The grapes ought not to be taken with reluctance, to prevent which it will be better to eat a little white bread with them. In fine weather the fruit should be consumed in the open air, during a walk; on cool days, however, it will be advisable to let the grapes be slightly warmed. The diet must be simple and temperate.

for whose disorders Kreuznach is indicated, such conditions seldom occur. But they are often found in adults, in whom the lymphatic predisposition was not annihilated previous to puberty, and in whom it has turned into hæmorrhoidal disposition. Exclusively of the quality of the fruit, the success of a grape-treatment depends essentially upon the choice of the locality in which it is undertaken. The climatic influences must be the same as those we have already indicated as suitable for the disease in question.

Should the bathing-course have been broken off before either a cure or the point of saturation had been attained, our endeavours will be directed to the most appropriate means of supplying the deficiency. If the Kreuznach waters were judged to be the proper remedy for the complaint, in default of these, the substitute that most resembles them will have to be provided. The mother-lye, which, as already observed, is capable of transport, offers us the means of preparing baths of the description desired. They ought, therefore, to be continued at home till the object in view is attained i. e. till a

cure is effected, or saturation appears. These baths are prepared by dissolving mother-lye and common salt in water. The proportions of these ingredients necessary to produce a resemblance to the natural Kreuznach baths are, 5 lbs of common salt and 4 pints of liquid lye, or 4 lbs. of *mutterlaugen-salt* \*) to 400 pints of water. The gradual additions of lye have to be reckoned apart.

Should even the after-effect prove incapable of extirpating the disease, — a circum-

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\*) The Kreuznach mother-lye is forwarded partly in a liquid state, in stone bottles containing 24 pints; or, after having been evaporated till nearly dry, is exported in a solid form, packed in small barrels, and bearing the name of „*Mutterlaugensalz*“. One pound of this salt holds the ingredients of a pint of liquid mother-lye. A considerable economy in the expenses of carriage is effected by choosing the *mutterlaugen-salt*. As the constituents are not always equally distributed in the mass, it is advisable at once to dissolve the contents of a barrel, in the proportion of 1 lb. to 1 pint of water, and to keep it stored up for use. If this plan be not adopted, and a single piece broken off as occasion demands, the bath may be sometimes too strong, sometimes too weak.

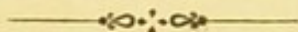
Applications for mother-lye, stating the quantity required, are to be addressed to the Directors of the Bath, or to any of the physicians here, who will with pleasure execute the commission, and, if required, give directions for use.

stance which from the obstinate nature of the maladies in question often happens, — a medicinal treatment must be entered upon. The medical adviser alone is able to judge whether such a treatment is to be employed immediately after the secondary effect has ceased, or in other words, when a pause in the hitherto gradual improvement has taken place; — or, whether it will be better to leave Nature to herself till the following year, when the mineral course at Kreuznach may be resumed.

With regard to the special treatment of scrofula, the leading rule will be, to avoid a *continuous* exhibition of medicines, from time to time to confine the curative procedure to a strict dietetic regimen, and in case of a resumption of medicines, to let an interruption in their employment take place. As stated above, it is in the spring and summer that the principal attack must be made. With reference to age, the most intensive effects of a treatment may be expected about the periods of development, i. e. about the seventh year and towards the time of puberty. A particular enumeration of the remedies that may be used between the

mineral treatments does not come within the province of this work. But if, on the one hand, an excessive use of medicines and mineral waters is to be condemned, it would be equally reprehensible to fall into the opposite extreme and to leave the disease to Nature alone, passively to await the period of puberty, and to console the patient with the suggestion, that at this epoch the *vis naturae* will extirpate his disease, while Art is unable to accomplish anything. It is just at the period in question that our utmost endeavours must be directed against the enemy; when this critical moment is suffered to pass in inactivity, it is seldom that we are able to recover the lost ground. The treatment of this disease requires the greatest circumspection and assiduity; that practitioner will be most successful, who possesses the most patience. It is an essential point, not to be premature in considering the treatment concluded. The mere disappearance of the local symptoms cannot be taken as a standard; we must judge by the general health. It is even possible that the disappearance of external affections may be a very unfavourable phenomenon, indicating

a metastasis to inner parts. We can never be sure that a cure has been effected, till the morbid disposition is eradicated. As long as this is not the case we are not certain that favourable circumstances will not cause a re-appearance of the disease. And it is not till the body is developed, and a state of health remains after the attainment of puberty, that we may feel assured of the predisposition being extirpated. When, however, the disease has continued beyond the age of puberty, there can be no conviction that the cure is complete and the disposition eradicated, till a series of years have elapsed without the slightest manifestation of the malady.



The first part of the paper is devoted to a general  
 consideration of the subject. It is shown that the  
 results of the experiments are in agreement with  
 the theoretical predictions. The second part of the  
 paper is devoted to a detailed description of the  
 apparatus used in the experiments. The third part  
 of the paper is devoted to a discussion of the  
 results of the experiments. It is shown that the  
 results of the experiments are in agreement with  
 the theoretical predictions. The fourth part of  
 the paper is devoted to a conclusion. It is shown  
 that the results of the experiments are in agree-  
 ment with the theoretical predictions.