

CARLSBAD

ITS NATURAL HEALING AGENTS





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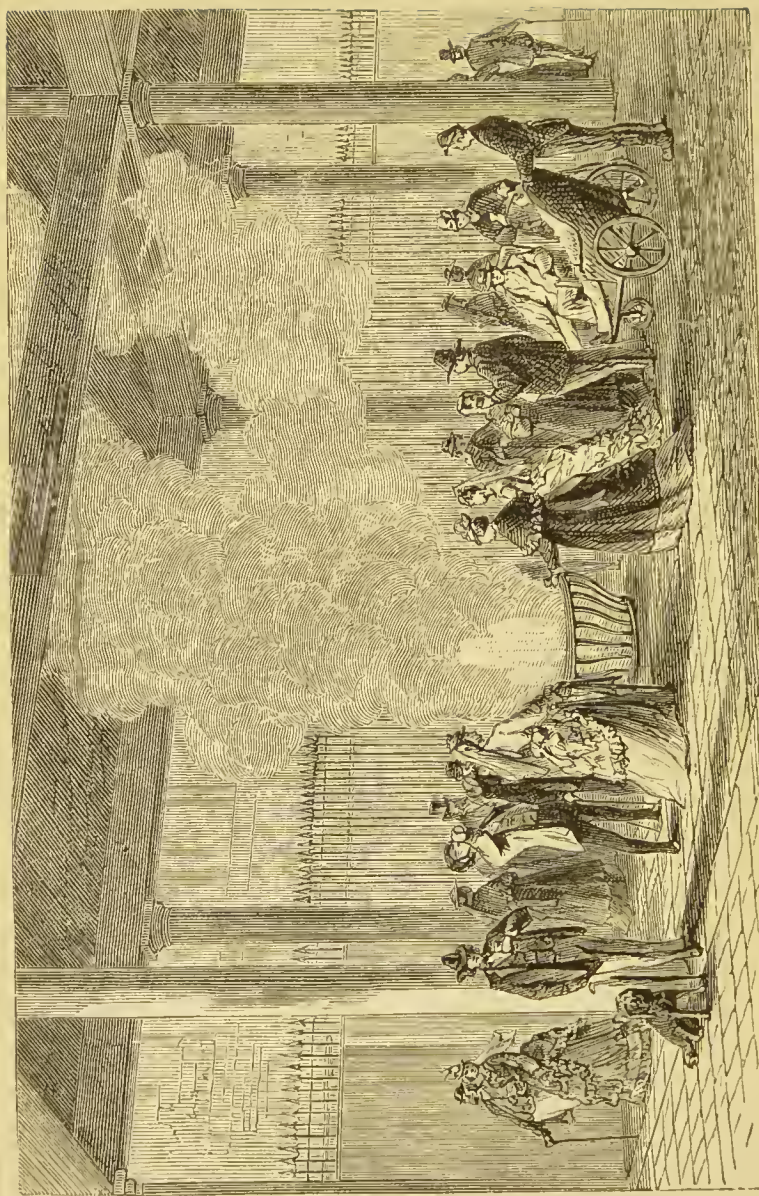
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The Sprudel.







# CARLSBAD

AND ITS NATURAL HEALING AGENTS

FROM THE

*PHYSIOLOGICAL AND THERAPEUTICAL  
POINT OF VIEW.*

BY

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CONSULTING PHYSICIAN AT CARLSBAD.

*WITH NOTES INTRODUCTORY*

BY THE

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RECTOR OF NORTON, DEVONSHIRE.

Second Edition, Revised and Enlarged.

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## PREFACE TO THE SECOND EDITION.

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It is with sincere pleasure that I accede to the request of my publishers, to issue a *second* edition of my work on Carlsbad. First of all, I wish to express my best thanks to my English and American colleagues for their favourable criticism of my work, and for their confidence in sending patients to Carlsbad to be under my care.

I have carefully revised the second edition, and have principally enlarged the portion of the book containing therapeutic indications. A new section, treating of the entire group of the alkaline saline mineral waters has been added, with the view of enabling practitioners to make a differential selection amongst them.

The latest analysis of our springs has given nearly the same results as former examinations, thus proving their accuracy, and showing at the same time that the solid constituents of our mineral waters have remained the same for many centuries.

I have, nevertheless, thought it right not to withhold from my readers the results of this analysis.

My esteemed friend, the Rev. John T. Walters, Vicar of Norton, when hearing that I was about to publish a second edition of my book, has been kind enough to forward to me a most flattering introduction to the same. I have caused this to be printed verbatim, not because I am in the belief of having deserved his highly complimentary opinion, but because I am convinced that he has thus rendered a meritorious tribute of gratitude to our health resort, augmenting at the same time the influx of patients to our far-famed thermal springs.

I venture to hope that this edition may again be met in a friendly spirit, and with favourable criticism on the part of the medical profession and the public.

THE AUTHOR.

LONDON, 1880.

## PREFACE TO THE FIRST EDITION.

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It has been my intention for several years to publish an English monograph concerning the mineral waters of Carlsbad, and I have been greatly encouraged in this task by many English physicians with whom I have had the pleasure of becoming acquainted on the occasion of my yearly visits to England.

I am perfectly convinced that Balneology, forming an integral part of our present therapeutics, has not only been studied, but also practically put to test by every rational medical man. Nay, more, every physician nowadays considers it absolutely necessary, according to means and leisure, to form an opinion of, at least, the chief bathing-places by personally paying them a visit.

Besides, a compendium of Balneology in the form of a manual should not be wanting in a physician's library.

Such books, on account of the copious material, can only treat the matter in a general way, relating

at the most the single groups of springs, but never giving a detailed account of the respective bathing-places.

This obvious want is met by the different monographs, by which the medical man becomes acquainted with the particulars of each separate watering-place, the mode of its use, and the salutary effects dependent thereon.

Thus only is he enabled to select for each individual case the proper place, among a group of springs similar to each other, with regard to their constituent parts.

It will be readily understood that I do not indicate those monographs, published by dozens at every watering-place, and compiled only for the use of the lay-public, but such books as are written in a purely scientific manner, and are especially designed for the medical profession.

This constitutes the purpose of the monograph in question.

Its first part enumerates in detail all the healing agents met with at Carlsbad.

The second part contains the rationally sustained indications, with a short outline of the ætiology and symptomatology of the different morbid conditions, and the contra-indications.



I have carefully avoided the relation of single cases, being on the point of selecting the more interesting instances out of the rich material collected during my many years' practice at Carlsbad, so as to publish them separately and in systematical order as a supplement to this monograph.

In the course of last year I published a pamphlet on the use of the Carlsbad waters, which was well received not only by the public at large, for which it was written, but by the medical profession as well.

I therefore cherish the hope that my present publication may meet with the same kind reception and indulgent judgment from my esteemed medical colleagues.

THE AUTHOR.



## INTRODUCTORY NOTES.

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HEARING from my friend, Dr. Kraus, that he is about to issue a second edition of his very useful "brochure" on Carlsbad and its curatives, I have ventured to offer a few introductory remarks on such matters as I think likely, from my own experience, to be of interest and service to any intending invalid-visitor who may be unacquainted with the place.

These remarks I shall confine as much as possible to matters outside the doctor's province, and only the writer must be held responsible for them.

In the outset it is due, I think, to the reader that I should say why I feel impelled to recommend and facilitate, if possible, a visit to these heaven-sent, health-restoring waters: it is simply from gratitude for personal benefits derived from their use, under the judicious skill and friendly guidance of Dr. Kraus.

To give confidence to other invalids I must, I fear, speak of myself still further. For seven or eight years I had suffered from intestinal disease, chronic

diarrhœa, dyspepsia, and frequent congestion of liver—maladies resulting from over-work, from residence in a relaxing valley of Devon in a dilapidated parsonage, and from the use of water from a well contiguous to the churchyard. I consulted several London physicians, and placed myself under various modes of medical treatment, without any lasting benefit. I also made several health-seeking visits to Malvern and to the Engadine, and found only temporary relief. In the autumn of 1876, being ill at St. Moritz, I consulted an English physician then practising there, and by him I was advised to try the waters of Carlsbad.

Acting upon this advice, I went to Carlsbad in the spring of 1877, and was providentially led to place myself under the care of Dr. Kraus,—of whose skill and prudence I must here be permitted again to make grateful mention. From this visit I derived great benefit, although it was lessened and impeded by subsequent anxiety and over-work. In the spring of 1878, I repeated my visit, with the same favourable result. And now, although I do not pretend to claim a perfect restoration to health for a frame enfeebled by fifty years' hard work and eight years chronic ill-health—I feel it a duty to encourage brother invalids, suffering from any maladies proceeding from

derangement of liver, from dyspepsia, diarrhœa, or its opposite, from intestinal disorders, or from any other disease which Dr. Kraus indicates, to have recourse to the springs of Carlsbad. Let the invalid go there and place himself under the care of Dr. Kraus, and submit in every point to his guidance. I advise this even when the invalid finds no encouragement from his medical attendant at home. With due respect to the skill and character of our English doctors, I must say, that, in my opinion, they are far too wedded to our insular modes of treatment by strong drugs, and do not avail themselves sufficiently of the use and benefits to be derived from the many springs, which have been beneficently given for the healing of our bodily maladies.

Now let me offer to the intending invalid-visitor to Carlsbad, who is ignorant of the route, a few hints for his help and guidance. Of the three or four ordinary routes, the shortest is by steamer from Queenboro' to Flushing, thence to Cologne, up the Rhine to Frankfort, and thence by Würzburg to Carlsbad. By this route the traveller leaves London at seven P.M., and reaches Carlsbad on the evening of the third day. But it has many disadvantages; the long sea-passage to Flushing in a steamer possibly crowded with Dutch and German peasants, the

wretched sleeping-accommodation (four berths in a cabin about eight feet square), and the long day's journey to Cologne, without any time for refreshment, are very injurious to an invalid. There are also the ordinary routes to Cologne by Dover, Calais, and Brussels, or by Ostend and Brussels—but I advise invalids to avoid the Rhine altogether. The hotels, with very few exceptions, are dirty, noisy, crowded with military, and their cookery bad. The best route for an invalid to take is, Dover to Paris, by day express to Bale (hotel "*Les trois Rois*"), thence to Zurich (hotel "*Bauer au Lac*"), thence to Rorschach, not stop there, but cross the lake of Constance by steamer to Lindau, where there is a nice hotel, the "*Bairischer Hof*," at which to sleep and rest; thence a six hours' journey by rail, through beautiful scenery, to Munich (hotel "*Les quatre Saisons*"); from thence another pleasant day's travel to Carlsbad. This route will occupy six days, but then every night is passed at an excellent hotel, and the railway journeys are pleasant and not over-fatiguing. Arrived at Carlsbad, if unprovided with lodgings, a night's rest at an hotel will enable the visitor to make his selection next day without hurry or fatigue. I strongly advise an invalid not to lodge in the lower parts of

the town, which lie along the banks of the river, but to betake himself to the high and healthy quarter frequented by the English, near the Anglican church, and there he will find excellent accommodation.

The daily mode of living at Carlsbad is very simple and pleasant. The waters must be taken before breakfast, with out-of-doors exercise, therefore early rising is indispensable (the motto is from poor King Jamie, "Up rose the sun, and up rose he)," and this necessitates going to bed with the birds. Meals are generally taken at one of the abundant and excellent restaurants. Luckily for the invalid, table d'hôtes are not the fashion at Carlsbad, and the few that exist he will wisely avoid. Dr. Kraus has given the reader such excellent advice on diet and regimen that any addition seems impertinent, yet my own sufferings from dyspepsia have been so severe, I would gladly, if possible, aid my fellow-sufferer. Let him then, permit me to say, avoid pastry in every form, excellent and tempting as it is at Carlsbad; eat the crust only of the rolls, good as they are, buy at a bakery the excellent rusk or biscuit indigenous to Carlsbad, called "Zwiebak" (choosing those made with salt, not sugar), and carry a bag of these to the restaurant for meals. The coffee is always good, tea generally so, eggs fresh,

butter (which should only be *looked* at) excellent. Early dining is the rule, but the invalid accustomed to a later hour can arrange to dine at six, and he will find it well to order his dinner at luncheon. Meat at Carlsbad is, as at every other place on the continent, uncertain and inferior; the safest and best thing to ask for is, strange to say, beef-steak: this is generally tender and nutritious, and it is well not to be curious as to whence it is cut! avoid veal, and with stews of every kind eat no gravy. Chickens are plentiful—tantalising, because little bigger than small pigeons—but wholesome, roast with plain bread sauce (which you may possibly have to explain how to make), or stewed with rice. Fish (from the river) is bad and dear. Vegetables scarce and inferior. However, with prudence and practice, the invalid will find his food sufficiently varied and wholesome. The great secret of safe feeding is—reversing the ordinary rule—to *eat sparingly, and to eat slowly*. And for this valuable advice my invalid reader will, no doubt, leave me a fee with Dr. Kraus!

A word or two as to wines at Carlsbad. Strong drinks, poisonous everywhere, are here doubly so. Giesshübler water, with one tablespoonful of Cognac to a tumbler, is a safe and pleasant beverage. If



wine is preferred, or felt necessary, French claret is best, and Medoc will be found about as good as Lafitte—in quality, if not in price. Avoid everywhere all Rhenish wines, whether still or sparkling, white or red—skilful combinations of sugared apple juice and cunning chemicals. Hungarian wines are better than Rhenish; probably not much adulterated, but often imperfectly made and new. Everywhere, out of France, wine is a great *crux* to the invalid traveller. My own experience is, that cheap wines are as good as dear wines, and that the less one drinks, and the more it is diluted, so much the better.

How to spend the day? is not a difficult question to solve at Carlsbad—where life is out of doors. Pine woods cover the hills on all sides, close to the town, and pleasant, well-kept walks, with seats, run in every direction. For those who prefer, or require driving, there are well-horsed carriages of various kinds; but the roads are not good, and they chiefly run along the valleys, and by the river, where the air is less bracing than on the hills. The town itself is bright and amusing to the visitor. Besides the resident population, summer brings a host of traders with the wares of Vienna, Munich, Prague, Tyrol, Switzerland, &c., anxious to lighten his purse. He

will also find numerous cafés and restaurants, with their pleasant and well-kept gardens and grounds, in which excellent *al fresco* concerts are given daily, and where better music will be heard for a few coppers than at English concerts for a crown. He will see five or six hundred people, from all parts of Europe, sitting in groups around the little tables in one of these gardens, chatting, working, playing games, listening to the music, discussing cups of coffee, glasses of lager beer or well-diluted wine and water; to an English visitor not only an amusing, but a suggestive sight. He sees no rudeness, no romping, no intemperance, no offence to eye or ear. He will say to himself, "Alas, poor England! land of strong beers, fiery spirits, poisonous port and oily sherry." But, as Mrs. Malaprop says, "comparisons are odious." Let us carry away from Carlsbad faith in moderation, in the well-proved wisdom of cheap, simple, social pleasure-taking, and in the great utility of a genial union of all classes for their common restraint and mutual good. Here let me warn the invalid not to frequent these concert grounds before the summer is well advanced and the air thoroughly warmed. Carlsbad climate, like our own, is changeable and treacherous in spring and early summer. It is never safe to sit out of

doors unprovided with a wrap to put on after walking, to avoid a chill. And specially is it necessary to use great precautions against taking cold at the commencement of drinking the waters. The water is hot; from its nature it acts upon the skin, as upon the bowels. Then, too, the early hour of rising, six or seven o'clock, the probably unaccustomed early morning exercise, all these things render the invalid at first very susceptible of cold; and a cold deranges the use of the water, confines probably to the apartment, and is therefore very carefully to be guarded against. Let the invalid, then, take every precaution,—by wearing warm underclothing,—better two vests than one thick vest—by using a thick overcoat in the morning, and a thinner one in the middle of the day; and specially must he guard against draughts and chills, and be prepared with both summer and winter clothing. I speak from dear-bought experience, and my invalid reader will thank me for emphasising the sound advice he will get from Dr. Kraus,—advice I was imprudent enough on my first visit somewhat to neglect.

The month allotted to the Carlsbad course soon passes by, too soon for the grateful convalescent, and also too soon for the invalid, whose progress to

convalescence has been slow: To the latter I would say,—“Take courage: you are probably further on the way to recovery than you suppose; a long and slow descent into ill-health can only be retraced with slow and halting steps.” The benefit of a visit to Carlsbad is seldom felt at first.

Now, lastly, as to the return. Here the patient must be guided by his physician. For my own part, I shall try to persuade Dr. Kraus not to send *me* either to the baths at Ragatz or St. Moritz. Ragatz after June is a frying-pan. St. Moritz becomes every year more crowded, dearer, and less agreeable every way as a health resort; and the baths are, simply, a disgrace to the managing Directory. I cannot but think a slow and careful return to England, in most cases, far the safer and more agreeable course. An English autumn at a well-selected health resort on the coast is a very pleasant time, and the convalescent, or invalid, will there get the benefit of good, wholesome food, instead of the indigestible fare of Ragatz and St. Moritz. Whether his course be to either of these places, or to England, he should retrace his steps by Munich to Rorschach, from whence it is but a short journey by rail to Ragatz, or to Chur for the Engadine. If *en route*

for England, he can make a pleasant trip from Zurich to Berne and the Bernese Oberland, returning by Neuchatel and Dijon to Paris.

In conclusion, I wish my reader a happy and successful visit to Carlsbad, and I congratulate him on the termination of this garrulous, but well-meant gossip.

*JOHN T. WALTERS,*  
*Rector of Norton, near Atherstone.*

*January 1880.*



# CARLSBAD.



## PART I.

### TOPOGRAPHICAL REMARKS.

CARLSBAD (Emperor Charles IV.'s Bath), the gem of the Bohemian, and the queen of all bathing-places, is situated in the north-western part of Bohemia (District of Eger), 1123 feet above the level of the sea, in a charming valley on both banks of the river Tepl, not far from its confluence with the river Eger.

The two parts of the town, separated by the Tepl, communicate with each other by many bridges, constructed partly of wood, partly of iron.

The mountains surrounding the town, and covered by beautiful woods (fir trees), offer a magnificent view from their summits, the latter being rendered easily accessible by well-kept paths; from several places a fine bird's-eye view may be obtained, showing the picturesquely situated Carlsbad. The bulk of the mountain, in the cleft of which Carlsbad

is as it were imbedded, principally consists of granite of various structure, intersected by more or less extensive veins of horn-stone; some outlets of this mountainous region show mighty layers of basalt.

As in all mountainous countries, the weather at Carlsbad is rather inconstant, and the temperature, principally in the morning and at night, is subject to rapid and marked changes.

The medium temperature is  $5.2^{\circ}$  R. ; the average maximum of the barometer twenty-six inches.

The state of health at our watering-place is excellent, in consequence of its favourable situation and the constant and sometimes rather powerful current of air; up to the present time epidemic diseases have been unknown at Carlsbad. The town within the last ten years has considerably increased in size, has been greatly embellished, and contains 850 houses, with 10,000 inhabitants.

The welfare of the population is materially enhanced by trade and industry flourishing to a great extent.

Carlsbad prides itself in the superior manufacture of shoes and gloves, of steel ware (knives and the celebrated Carlsbad needles), of cabinet and mosaic work (the latter made of Sprudel stone), &c., &c.

The greater part of the inhabitants belong to the



Roman Catholic Church, only a very small proportion professing the Protestant or Jewish creed.

Carlsbad has a Roman Catholic, a Protestant, an English, a Jewish, and a Russian Church.

There are three hospitals for the admission of the sick poor, and an asylum for invalids.

There are railroads connecting Carlsbad with all directions.

NAME AND TEMPERATURE OF THE CARLSBAD  
MINERAL SPRINGS (NEWEST MEASURE).

	R.	F.
1. The Sprudel, . . . . .	} 59.5°	166°
2. „ Hygiea-Quelle, . . . . .		
3. „ New Hygiea-Quelle, . . . . .		
4. „ Bernhardsbrunn, . . . . .	53°	150°
5. „ Curhausquelle, . . . . .	52°	147°
6. „ Neubrunn, . . . . .	50°	143°
7. „ Felsenquelle, . . . . .	48°	138°
8. „ Theresienbrunn, . . . . .	48°	138°
9. „ Mühlbrunn, . . . . .	45°	133°
10. „ Schlossbrunn, . . . . .	43.5°	126°
11. „ Marktbrunn, . . . . .	40°	122°
12. „ Kaiserbrunn, . . . . .	39°	120°
13. „ Elisabethquelle, . . . . .	37.6°	116°
14. „ Hoehbergerquelle, . . . . .	33°	106°
15. „ Kaiser Karl-Quelle, . . . . .	31°	101°
16. „ Russische Kronquelle, . . . . .	29°	96°
17. „ Sprudelsäuerling, . . . . .	23°	85°

These springs have been analysed by order of the Government by specially appointed Commissioners as well as by physicians and private analytical chemists; they unanimously agree in saying that 1 lb., 16 ounces of the Carlsbad mineral waters contains 41-42 grains of solid constitu-

ents. The differences resulting from the comparison of the various analytical examinations are of so trifling a nature as not to be worth consideration; and it was universally acknowledged in principle, that the Carlsbad mineral waters all contain the same solid constituents in equal quantity.

The following table contains the separate analysis of three of the most important and principally exported mineral springs of Carlsbad, resulting from an examination made by Professor Ragsky in 1863:—

Solid Constituents Contained in 16 Fluid Ounces.	Sprudel.	Mühlbrunn.	Schlossbrunn.
Sulphate of potash, . . .	1.2564	1.7172	1.4645
Sulphate of soda, . . .	18.2160	17.9610	17.2455
Chloride of sodium, . . .	7.9156	7.8690	7.5282
Carbonate of soda, . . .	10.4593	10.8679	9.5620
Carbonate of lime, . . .	2.2870	2.0236	3.0658
Carbonate of magnesia, . . .	0.9532	0.2641	0.3870
Carbonate of protoxide of iron, . . . . .	0.0215	0.0230	0.0176
Carbonate of protoxide of manganese, . . . . .	0.0046	0.0053	0.0053
Carbonate of strontia, . . .	0.0061	0.0069	0.0046
Phosphate of aluminium, . . .	0.0030	0.0025	0.0023
Phosphate of lime, . . . . .	0.0015	0.0016	0.0030
Fluoride of potassium, . . .	0.0276	0.0268	0.0291
Siliceous earth, . . . . .	0.5590	0.6190	0.7365
Total of solid constituents,	41.7090	41.3870	40.1523
Free carbonate } in grains,	5.8670	7.3260	10.2940
acid, } in cubic inches,	11.8820	14.8370	20.6200

Besides, there were found minute quantities of Iodide of Sodium, Bromide of Sodium, Lithia, Boracic acid, Rubidium and Caesium.

The various springs differ essentially with regard to the quantity of free carbonic acid contained in them, the cooler springs possessing more, the hotter springs less of this gas.

LATEST ANALYSIS BY PROFESSOR LUDWIG OF VIENNA.  
(1879.)

10,000 Grammes of the Water contain.	Sprudel.	Mühlbrunn.	Schlossbrunn.
Carbonate of protoxide of iron . . . . .	0.030	0.028	0.001
Carbonate of protoxide of manganese . . . . .	0.002	traces	traces
Carbonate of magnesia . . . . .	1.665	1.613	1.615
Carbonate of lime . . . . .	3.214	3.266	3.337
Carbonate of soda . . . . .	12.980	12.790	12.279
Carbonate of strontia . . . . .	0.004	0.004	0.004
Carbonate of lithia . . . . .	0.123	0.118	0.136
Sulphate of potash . . . . .	0.862	1.188	1.930
Sulphate of soda . . . . .	24.053	23.911	23.158
Chloride of sodium . . . . .	10.418	10.288	10.047
Fluoride of potassium . . . . .	0.051	0.046	0.046
Borate of soda . . . . .	0.040	0.029	0.039
Phosphate of lime . . . . .	0.007	0.009	0.004
Siliceous earth . . . . .	0.004	0.005	0.005
Silicic acid—anhydrate . . . . .	0.715	0.735	0.703
Caesium, rubidium, bromine, iodine, arsenic, antimony, zinc, selenium, thallium, formic acid . . . . .	} traces	traces	traces
Total of solid constituents	55.168	54.730	53.304
Carbonic acid, half-combined . . . . .	7.761	7.672	7.493
Carbonic acid, free . . . . .	1.898	5.169	5.822

SITUATION AND HISTORY OF OUR  
MINERAL SPRINGS.

A.—SPRINGS SITUATED ON THE RIGHT BANK OF THE  
TEPL, UNDER THE SPRUDEL-COLONNADE.

1. *The Sprudel*, the oldest and most abundant spring of all, is used for drinking, for the preparation of salt, and for bathing.

2. *The Hygiea-Quelle* (old and new H.Q.) came to light in 1809 on the occasion of the outbreak of the Sprudel, and is only used for bathing.

3. *The Sprudelsäuerling*, enclosed since 1863, but rarely used.

B.—SPRINGS SITUATED ON THE LEFT BANK OF  
THE TEPL.

4. *The Marktbrunn*, on the Marktplatz, discovered in 1838 and enclosed, is much used for drinking.

5. *The Kaiser Karl-Quelle* (formerly called Rathausbrunn), also on the Marktplatz, enclosed since 1871, and used for drinking.

6. *The Schlossbrunn*, on the Schlossberg, enclosed and used for drinking since 1797. This spring suddenly disappeared on the occasion of the great outbreak of the Sprudel in 1809, and made its reappearance as

late as 1823; the Schlossbrunn, together with the Markt and Mühlbrunn, are principally used for drinking.

7. *The Russische Kronquelle*, opposite the Schlossbrunn, is more frequently used for bathing.

8. *The Theresienbrunn*, above the Mühlbrunn-Colonnade, is an old and well-known spring, and enclosed since 1726; its temperature having been much cooler, it was more in use formerly than at the present time.

9. *The Mühlbrunn*, at the entrance of the Colonnade called by its name, has been used for drinking since two centuries, and is still resorted to with great partiality.

10. *The Neubrunn*, beneath the Mühlbrunn-Colonnade, enclosed since 1748, was more used in bygone times.

11. *The Bernhardsbrunn*, beneath the Mühlbrunn-Colonnade, known since 1784, was formerly used for the manufacture of the salt; at the present time its use is discontinued almost entirely.

12. *The Elisabethquelle* (formerly called Orchesterquelle), likewise beneath the Mühlbrunn-Colonnade, enclosed and used for drinking since 1874.

13. *The Felsenquelle*, at the lower end of the Mühlbrunn-Colonnade, enclosed since 1844, and in great demand for drinking.

14. *The Curhausquelle* is situated between the Felsenquelle and the Curhaus, enclosed since 1866, and used for bathing.

15. *The Kaiserquelle*, at the military hospital, discovered and enclosed in 1851, is used for drinking and bathing.

16. *The Hochbergerquelle*, likewise at the military hospital, is merely used for bathing.

#### ORIGIN OF THE CARLSBAD MINERAL WATERS, THEIR CHEMICAL AND PHYSICAL PROPERTIES.

There can be no doubt whatever that the manner of formation of the Carlsbad springs does not differ in the least from that of all other mineral waters. They receive their natural temperature and their solid and gaseous ingredients in a chemical and mechanical way in the depth of the soil.

A part of the water covering, according to our knowledge, the greater part of the globe, is by aid of the atmospheric temperature reduced to vapour, which, after rising so as to form clouds, again descends as rain, snow, &c., and in this form is ultimately absorbed by the soil. There it accumulates in fissures and clefts until its quantity having become sufficiently large, the pressure of the subterraneous gases causes it again to force its way to the surface

of the soil, where it appears as "a warm mineral spring."

The deeper the above-named precipitates penetrate into the depth of the soil, the hotter will the strata be with which they come into contact, the latter slowly imparting their own temperature to them; hence the increased temperature of many springs, their reservoirs necessarily lying at a great depth, as the heat of the soil is only detected at a certain point, increasing in geometrical proportion with the depth penetrated.

Considered approximately, the waters of the Carlsbad Sprudel, having a temperature of  $59.6^{\circ}$  R. ( $166^{\circ}$  F.), would consequently have its reservoir at a depth of 7000 feet. As mentioned before, all our mineral springs contain the same solid ingredients, differing respectively only in temperature and in the amount of free carbonic acid; we are therefore led to the conclusion that they all have one common reservoir, their respective branches, however, winding their way in various manners before appearing on the surface of the soil.

The stronger the branch and the shorter its way before it reaches the surface, the less it will be wanting in original temperature; the weaker the spring and the more numerous the windings it has to pass

through on its way from the reservoir, the cooler will its water be. The great influence which the amount of water of a certain spring possesses on its temperature is proved if a spring, hitherto containing but little water, is enclosed in a greater depth, its side outlets being blocked up at the same time; this spring will in consequence not only contain more water, but its temperature will simultaneously be raised to a higher figure.

The water receives its solid mineral constituents by becoming first impregnated with the great quantity of carbonic acid contained in the soil, and being further supported by the strong atmospheric counter-pressure, it is ultimately enabled to dissolve solid minerals existing in its course by mechanical and chemical action, and to imbibe the dissolved salts which are kept in solution by the aid of the carbonic acid gas.

This mineral water is at last forced to the surface by means of the combined pressure of the succeeding quantities, and of the gas accumulated in the subterranean regions, and finally shows itself as a warm mineral spring.

Experiments made for this purpose by the chemist Göttl have shown conclusively that the granite from which our springs emerge contains all their mineral



constituents, viz., soda, lime, potash, siliceous earth, aluminum, magnesia, iron, manganese, arsenic, chlorine, fluorine, sulphur, sulphuric and phosphoric acid.

The specific gravity of our mineral waters is greater by the fourth or fifth of a thousand when compared with that of common water; they are perfectly clear and transparent, have no smell, and a faint flavour of salt, leaving behind an after-taste of diluted potash.

Erdmann and Göttl have furthermore discovered negative electro-magnetic currents emanating from the warmer Carlsbad springs.

The Sprudel, the hottest of our springs, evinces a capacity of covering all solid objects, over which its water runs for any length of time, with a stony crust, varying in colour from a light yellow to a darkish brown in all possible shades, and consisting principally of calcareous earth, siliceous earth, and iron.

The explanation of this strange phenomenon is as follows:—The earthy constituents of the mineral waters are only kept in solution by means of the carbonic acid in the form of bicarbonates. As soon as the hot Sprudel water comes into contact with the atmospheric air, part of its carbonic acid is

lost, and consequently part of the salts is precipitated, and this forms a hard crust on the outer surface of all objects covered by the water.

Apart from the other precipitates, a green mass of more or less solid structure, the so-called "green matter," may also be discovered in close proximity to our hot springs, consisting of confervæ, which contain an abundance of microscopic animals of the lowest order.

## GENERAL AND LOCAL EFFECTS OF THE MINERAL WATERS OF CARLSBAD.

On account of their chemical composition, the Carlsbad springs belong to the alkaline saline mineral waters, among which they take first rank. Their action is produced by the combined effects of the water, the natural temperature, the carbonic acid gas, and the mineral constituents. The natural temperature of the water accelerates the action of the absorbing tissues, stimulates the circulation of the blood, induces salutary effects by producing perspiration, and acts as a sedative, and consequently as an antispasmodic, on the nervous system.

The carbonic acid gas not only acts on the skin, but also on the stomach, thus either augmenting the

secretion of gastric juice, or calming the sensitive nerves of the stomach; it also acts in an invigorating manner on the peristalsis of the stomach and intestinal tract, facilitating digestion as well as resorption. By acting directly on the lungs and lymphatic vessels, it ameliorates the condition of the respective secretions, stimulating at the same time the action of the ganglionic system, if somewhat tardy.

The salts of soda generally have rather a dissolving than a purgative effect. As a regular constituent of the human body, they augment the formation of the blood-corpuscles and regulate the economy of the whole system, thus inducing highly beneficial effects.

The sulphate of soda acts as an agreeable aperient, the carbonate is milder; its power of neutralising the acid in the intestinal tract is not sufficient to account for the prodigious results produced in so many diseases of nutrition and reproduction, and in functional disorders of the same. This action is powerfully assisted by the water itself as the great common solvent principle, which pervades and dissolves the contents accumulated in the bowels.

The carbonate of lime, combined with soda, removes acidity, and by its chemical action stops the

formation of urinary deposits, contributing, at the same time, energetically to the solution of concretions that may have eventually formed.

Although the quantity of protoxide of iron, siliceous earth, and magnesia, of lithia, iodine and bromine, is less considerable, still their presence may be deemed indispensable for producing the curative effects of the waters.

Our mineral waters are agreeable to the taste, cause a pleasant feeling in the stomach, and after the lapse of one or several hours, induce one or several fluid motions, which in common with the flatus, have a strong smell of sulphuretted hydrogen. These, especially at the beginning of the cure, are of a dark brown, sometimes green colour, which is caused by the increased secretion of thick bile.

An increase of urine is further seen in all cases, but generally not before the sixth, seventh, and eighth day, with the single exception of diabetes; here the contrary takes place, and we see a return of the increased urinary secretion to its normal state, corresponding to the diminished thirst and to the reduced want for fluids.

Repeated examinations of the fresh urine have shown that, when originally containing much acid, the urine one hour after drinking the waters, shows

already a very slight acid, and sometimes even neutral reaction.

I have, however, never succeeded, and even with patients using the waters for six weeks, in producing a distinct alkaline reaction of the urine. Professor Seegen has proved a decrease of uric acid and urea, corresponding with an increase of phosphoric acid.

All the mucous membranes soon show congestion, and increased secretion follows in consequence.

Further, absorption is stimulated, and a diminution of all fatty deposits soon is traceable. The blood is of a thin condition and pale colour.

An energetic influence upon the whole nervous system soon becomes evident.

Patients who have, even years ago, suffered from ague, will sometimes, while drinking the waters, suffer a relapse of the fever in its primary form. My experience in this respect, however, has shown that these relapses, if occurring at all, only do so during the first fortnight of the cure.

The case is different with patients suffering from gout; sometimes the attack of this malady will take place during the first days of the cure (perhaps in consequence of the fatigues of the journey and the unaccustomed exertion attendant upon walking), but more frequently I have observed them towards the

latter end of the cure. Some of my patients have communicated with me by writing, to the effect that they were seized with an attack on the journey home, or soon after their return; remaining, however, free of them afterwards for years together.

The influence of our (Sprudel and Moor) baths on patients suffering from gout is most remarkable, but never to be guessed beforehand, as it can only be traced by experience in each individual case.

Many of these patients are greatly relieved by the baths; they feel better and stronger after each bath, their beneficial effect upon the arthritic joints, in restoring their mobility, being evidently surprising.

In some cases, however, we find just the contrary taking place; although the patients are relieved while drinking the waters, the baths do not agree with them. They feel very weak and depressed in mind even after the first bath, and—deserving a special remark—they suffer from repeated attacks of gout, increasing sometimes in violence to such an extent, as to necessitate an interruption of the cure. If the baths in these cases are discontinued, the patient's condition will soon improve, the symptoms of the arthritic diathesis gradually disappearing altogether. But the most striking occurrence,—and I have made this observation very frequently in

my practice,—was, that when I sent such patients for an “*after-cure*” to a so-called indifferent Therme (Gastein, Ragatz, Wildbad), the baths at these places had a very good effect upon them. I do not think it possible to give a general explanation of this strange fact; its cause, according to my opinion, arising from the individual constitution of the respective patients, and from the increased or deficient irritability of their vascular system. There can be, however, no doubt as to a certain influence of the different climate and the thermal water.

It may be mentioned, further, that in cases of diabetes a marked improvement of the most harassing symptoms, such as the thirst, the parched mouth, the frequent micturition, begins to be apparent after a few days. In cases of hemorrhoids, repeated bleedings commonly occur; in female patients the catamenia appear earlier and more abundantly, and should their beginning have been attended with pains, these become less severe or cease altogether.

THE COMBINED ACTION OF OUR MINERAL WATERS  
MAY CONSEQUENTLY BE SUMMARISED AS FOLLOWS:—

1. The vital action of the organism is stimulated to greater energy.

2. The surplus of acidity and of fatty deposits is removed by increased and altered absorption.

### SPECIAL ACTION OF THE CARLSBAD WATERS.

*A.—By coming into immediate contact with the mucous membrane of the stomach and intestinal tract, the waters act—*

(a.) As soothing, invigorating, and regenerating agents on the nerves of the stomach; whence the increased appetite and the pleasant, warm sensation propagating itself from the stomach over the whole surface of the body.

(b.) In a healing way in cases of simple erosions, and ulcers of the mucous membrane of the stomach and duodenum.

(c.) As correctives of the too abundant secretion of acid in the intestinal tract.

(d.) As gentle purgatives and accelerators of the peristaltic action, removing the viscid mucous secretion, and mechanically dissolving the hard and dried-up fæces; as a general result of these influences the mucous membrane of the intestinal channel is energetically stimulated to increased secretion.



*B.—Being absorbed by the blood, the waters act—*

(*a.*) By dissolving the concentrated and obstructed bile contained in the biliary ducts.

(*b.*) By changing the condition of the blood, which, in its venous state, principally stagnates in the mesenteric vein and its branches; thus the waters regulate and increase the venous, and consequently also the arterial circulation.

(*c.*) By relieving the lymphatic glands and vessels of the thick and concentrated lymph contained in them.

(*d.*) By removing the fat accumulated in the subcutaneous areolar tissue and other organs, and by causing old inflammatory residues (for instance in the peritoneal cavity) to be absorbed.

By acting powerfully on the kidneys, the mineral waters at the same time succeed in removing gravel and even larger stones from kidney and bladder.

This beneficial influence of our mineral waters is enhanced by the following circumstances, if the waters are partaken of at Carlsbad itself:—

1. By the invigorating effect of the journey, and the change of social intercourse.

2. By getting rid of the usual occupation and mode of life, frequently attended with care, excite-

ment, and annoyance, and by the benefit resulting from a new and unusual way of living.

3. By the change of air, surroundings, diet, &c., &c.

Such salutary aids to improvement are, of course, wanting altogether, or at least to a large extent, when the mineral waters are used at home, and consequently it is, of course, easy to understand that home cures are rarely attended with entirely satisfactory results.

### FINAL REMARKS.

The total effects of the cure on the separate organs, or on the whole of the organism, generally show themselves either during the time of drinking the waters, or at its conclusion. Sometimes, however, this is not the case, and the patients leave Carlsbad without having improved to any remarkable extent; in such cases, supposing that the use of the Carlsbad waters was really indicated, the improvement will take place during the time of the after-cure, and it may be regarded certainly as more than a vague consolation, if the medical attendant positively assures the patient who, dissatisfied and disgusted, is on the point of leaving Carlsbad, that the good results of

its waters will only show themselves after some weeks more.

This experience of the salutary effects of an after cure is universally acknowledged. Dr. Strobelberger, in his book, published in the year 1630, says :—

“As the human body at the time of the cure does not enjoy any rest through the constant worry attendant upon the drinking and bathing, and as the whole system is being revolutionised and stirred up by the mineral waters, it is impossible for the patient, during or immediately after the cure, to feel as well as a fish in water; the most decided improvement only taking place after some time, with the help of good diet and nursing.”

It is difficult, nay, almost impossible, to give any general or special rules concerning the mode of using our mineral waters. This is a matter of practical experience, and the treatment is to be adapted to each individual case; consequently we must take this carefully into account, as there is no treatment suiting all cases alike.

This rule applies to all the various springs (which, although containing the same solid constituents, yet act in a very different manner upon one and the same individual, according to their temperature and the

greater or smaller amount of carbonic acid dependent thereon), as well as to the quantity taken daily.

FUNDAMENTAL PRINCIPLES TO BE TAKEN INTO CONSIDERATION WHEN PRESCRIBING OUR MINERAL WATERS FOR INTERNAL USE:—

1. The cooler springs are only slowly absorbed by the system, while the hotter waters are being taken up in a rapid manner.

2. Patients whose action of the heart has to be watched with care, and whose vital energy will not submit to much stimulation, must partake of the cooler springs.

3. For acting more energetically, we use the hotter springs, if the constitution of the patient will admit of doing so. The particular spring selected is not to be changed without sufficient reason.

4. The waters, as a rule, are taken in the morning before breakfast, as the empty stomach will require less time to absorb the waters.

5. The quantity for daily use is not to exceed six tumblersful (30 ounces), and it is advisable to begin with two or three tumblersful, and in many cases even with less. Only, after several days, the quantity is to be increased, this depending partly

on the individual constitution of the patient, and on the respective disease, partly on the effect already attained or still wished for.

6. The tumblerful of the water is to be consumed slowly (in 1-3 minutes), a pause of twenty minutes or more being made between each tumbler, according to the state of the patient's digestion, and moderate walking should be resorted to during this time.

7. After finishing the last tumblerful, the patients ought to walk about till they feel hungry for breakfast, which generally will be the case in about one hour's time.

## PRODUCTS OF THE CARLSBAD MINERAL SPRINGS.

### 1.—*The Carlsbad Salt (Sprudel Salt).*

Dr. Borries, in the year 1733, was the first to obtain the Sprudel salt, by evaporating and crystallising the residuum of the Sprudel water, Dr. Berger having already, as far back as 1708, hinted at the idea of obtaining the salt from the Sprudel water. In 1734 a work was published by Dr. F. Hoffmann, under the title, "The Superior Virtues and Effects of the Carlsbad Salt." The citizens of

Carlsbad, however, at that time objected, out of pure narrow-mindedness, against the preparation, as well as, principally, against the sale of the salt, fearing lest the influx of strangers should suffer thereby. This feeling of apprehension increased to such an extent that, after the manufacture had been entirely stopped for a certain time, the salt was allowed to be given only to patients residing at Carlsbad for a cure, merely a few ounces of it being dispensed at a time.

Dr. B. Becher very much simplified the manner of preparing the salt, and greatly reduced its price, by applying the natural heat of the Sprudel water itself for the purpose of evaporating, instead of resorting to the wood-fire used in former time.

He, too, had to struggle against the above-named prejudice, until at last, in 1761, the public preparation of the salt (till then in private hands), according to Becher's method, was decreed by a Government Act, and thus the unjustifiable narrow-minded prejudice was overcome in the lapse of time.

The production increasing rapidly in proportion with the demand, it was at length considered necessary, in 1808, to construct a special building, connected by pipes with the Sprudel water, for the purpose of its evaporation by means of coal-fire. Even this new arrangement proving inadequate,

other contrivances are now being put into operation, so as to obtain the salt in unlimited quantities.

The production of the salt at present already amounts to 800 hundredweights annually, but this quantity does not by far cover the ever-increasing demand for it.

Analysis of the Sprudel salt, by Professor Dr. Ragsky.—100 parts of Sprudel salt contain:—

Sulphate of soda,	.	37,695	parts.
Carbonate of soda,	.	5,997	„
Chloride of sodium,	.	0,397	„
Water,	. . .	55,520	„
		<hr/>	
Total,	. . .	99,609	parts.

Besides, there are traces of sulphate of potash.

The Sprudel salt (which is exported in well-corked and sealed bottles, containing one half to one pound) appears in crystallised form (larger and smaller hexagonal prisms), is of neutral reaction, of pure, colourless transparency, has a bitter saline taste, and is soluble in cold and warm water.

The therapeutic effects of the Sprudel salt, generally speaking, and with only some slight modifications, are similar to those of the Carlsbad mineral waters, and consequently its indications

and contra-indications are nearly the same as in the case of the waters. According to the effect desired, and to the individual constitution, the Carlsbad salt must either be taken early in the morning, before breakfast only, or at bedtime as well, the respective dose amounting to one teaspoonful to be dissolved in five ounces of either common water, or, what is better still, in the same quantity of Giesshübler-Sauerbrunn.

The water is first made to boil, then the salt is added, and the solution is consumed slowly in a lukewarm state. Directions for use—See Medical Guide concerning the use of the Mineral Waters at Carlsbad, by J. Kraus, M.D., Carlsbad: Hans Feller; London: Trübner & Co., 1876.

## 2.—*The Alkaline Carlsbad Salt.*

This salt is obtained by the complete evaporation of the hot Sprudel waters. The dry, dust-like residuum (the alkaline salt) is of a yellowish-white transparent colour, finely grained, and has a strong alkaline taste.

Dissolved in water, it soon gives a blue tinge to the red litmus paper. It naturally contains all the constituent parts of the water, and being not used



extensively for therapeutic purposes, it principally serves for the manufacture of

### 3.—*The Carlsbad Sprudel Lozenges.*

These lozenges are stronger than those made at Vichy, and their use is attended with good results in cases of acidity in the stomach, heartburn, acid eructation, and flatulency. Four to eight lozenges may be taken in the course of the day.

### 4.—*The Sprudel Soap.*

The Carlsbad soap, or Sprudel soap, is prepared from the molten-liquor left after the Sprudel salt has been extracted in the crystallised form. This remainder of the brine has a specific gravity of 1.160, and 16 ounces of it contain 2 ounces and 3 drachms of a mixture of salts freed from water. This mixture is composed of different salts of soda, organic matter, and traces of lime, magnesia, bromine, iodine, iron, ammonia, lithia, arsenic, sulphuretted hydrogen, phosphoric and carbonic acid.

In order to make soap out of this chemical compound, it must be condensed, purified from the Glauber's salt, which it still may contain, and by

adding some quicklime, be turned into caustic ley.

The further preparation is the same as with all other soaps.

The Sprudel soap is of soft consistence, of greyish-white colour, very strong, perfectly soluble in water, and possesses considerable healing power on account of its chemical composition.

It acts on the skin in a stimulating and regenerating manner, dissolves the lymph stagnating in the capillary vessels, and tends to remove any inflammatory deposits which may have accumulated in the areolar tissue. It is principally used as an addition to plain water-baths, one quarter, one half, to one pound being required for each bath.

## THE EXPORTED CARLSBAD MINERAL WATERS.

All our springs are suitable for exportation, provided they are bottled and corked with the necessary precaution. Numerous trials have shown that under these conditions the water in the bottles will keep good for years.

The cooler springs, containing the greatest quantity of carbonic acid, are best suited for

exportation ; hence the Mühlbrunn, the Schlossbrunn, the Marktbrunn, but also the Sprudel, are principally exported.

It must be stated, therefore, that the mineral waters exported in well-corked bottles, and gradually heated to the required temperature, will in all important respects possess the same healing influence as the waters when drawn immediately from the respective springs. The greater efficacy (which it is impossible to deny) of the waters when taken at their original source may be ascribed to reasons accessory rather than paramount, viz. :—The constitution of the patient being prepared for the action of the waters by the salutary effect of the journey and the change of air ; the regulations for the use of the waters being given by the local medical attendant, who is expected to be best acquainted with the action of the different waters, to which again may be added the greater faith generally placed by the patients in the waters when consumed at their proper source.

Their beneficial influence in many cases is further enhanced and accelerated by bathing in the same water, which, of course, is only possible at the place itself.

Although for these and other similar reasons the

use of the waters on the spot is advisable to all those patients who have leisure and means to repair to Carlsbad, we do not for a moment hesitate in recommending the use of the exported mineral waters to those whose circumstances will not permit of the journey to Carlsbad.

There are cases, moreover, in which the exported waters serve as a most valuable help, viz. :—If the illness should be such as not to admit of delay with regard to treatment, the season of the year, however, at that time not being suitable for a long journey, or if the debility of the system should necessitate a mild preparatory use before undergoing the hardships attendant upon the regular cure at Carlsbad.

Among such cases we may mention :—*Gallstones* and *gravel*, the violence of the attack demanding prompt action; *gout*, *diabetes mellitus*—in short, all disorders where the delay in the use of the appropriate mineral waters might be attended with the worst consequences.

Should these waters, as it frequently happens, be taken when cold, the selection of any particular spring is of no importance whatever; if, however, they should be consumed in a lukewarm state, then the cooler springs must be gradually heated, so as

to acquire the desired temperature; regarding the Sprudel, however, it might easily happen that when heated it will become decomposed and rendered unfit for drinking, containing, as it does, only a very small quantity of carbonic acid.

When taken cold, the mineral waters, principally if some Sprudel salt is added, will cause light and pulpy evacuations of the bowels, unaccompanied by any excitement of the circulation or derangement of the digestion.

When taken lukewarm, thus imitating their use at Carlsbad itself, they have the same salutary effect as at Carlsbad, those accessory influences, however, which contribute so greatly towards the attainment of these good results, constantly seen after a cure at Carlsbad, necessarily absenting themselves in these cases.

In accordance with the just-mentioned remarks, the exported Carlsbad mineral waters are used:

A.—As a preliminary cure before going to Carlsbad. Such preliminary cures, combined with sufficient exercise in the open air, and with a corresponding diet, cannot be too strongly insisted upon, and it hardly will be deemed necessary in this place to enumerate all the advantages dependent thereon.

The preliminary cure, *i.e.*, the daily use of one to two tumblersful of the cold mineral water, with some slight addition of Carlsbad salt, is especially indicated :

1. In cases not permitting the immediate use of the warm springs on account of congestive disorders, and requiring first a depletion by means of repeated evacuations, of the system in general, and of the respective congested organs in particular.

2. In cases of habitual constipation, so as to clear the mucous membrane of the intestinal tract of all fæcal accumulations, thus facilitating the power of absorption with regard to those warm springs to be used hereafter.

*B.*—As an after-cure in case the patients are not enabled to stay at Carlsbad until the termination of the regular course.

*C.*—As a regular drinking-cure for the great number of those who, although their cases indicate a cure at Carlsbad, are unfortunately prevented from complying with such demand.

In cases *B.* and *C.* the water is to be consumed in a lukewarm state, the precise temperature required being accurately determined by the attending medical man, and changed as he thinks fit. For particulars

see Medical Guide concerning the use of the mineral waters at Carlsbad, by J. Kraus, M.D., Carlsbad: Hans Feller; London: Trübner & Co., 1876.

Regarding the artificial waters used in remote places as a substitute for the natural mineral waters, their value as an addition to our curative treasures being unquestionable, and their use being a real blessing to thousands of those who are unable to obtain the natural waters, it would still constitute an unwarrantable proceeding to assert that their action is equal to that of the natural mineral waters, however scientific the composition, and however successful the imitation of the artificial waters may be. For although they may contain all the "known" ingredients of the former, as discovered by chemical analysis, yet they do not contain those constituents, hitherto "unknown," which latter, as we have no doubt, greatly contribute towards the attainment of those highly salutary effects resulting from the use of the natural mineral waters.

There was at first the same agitation going on against the exportation of the waters which we mentioned with regard to the Carlsbad salt, arising from the same motives, and in consequence it was for a long time carried on in a very slack manner. Another reason for this may be sought for in the

great difficulty of the means of communication existing in former years.

During the last thirty years, however, all this has been considerably improved, and we may look with gratitude to Mr. H. Mattoni, who has managed the exportation during the last twenty years, as by his assiduity our mineral waters are now being sent to all civilised parts of the world, the quantity at present already amounting annually to one million bottles.

The exportation of the Carlsbad mineral waters and the Carlsbad salt has, since January 1st, 1877, been transferred to the firm of Mr. L. Schottländer, and it is to be hoped that under his direction it will continue to increase from year to year.

### THE BATHS.

We have at Carlsbad :—

- (a.) Common or sweet water baths.
- (b.) Mineral baths.
- (c.) Moor baths.
- (d.) Vapour baths.
- (e.) Douche baths.
- (f.) Steel baths.
- (g.) Sauerbrunn baths.

It is thus evident that Carlsbad possesses a greater



variety of baths than almost any other bathing-place in the world.

*The common or sweet water baths* may be taken in the Curhaus, and are only used for the sake of cleanliness.

*The mineral baths* (formally called Sprudel baths) may be taken at the Sprudel-Badehaus, Mühlbadehaus, and Curhaus. The springs, which are in use for bathing, have already been spoken of. Temperature of the baths 26-30° R.

*The moor baths* have found but scanty room in the Curhaus. They have not been much in use in former time, but the demand has of late increased to a considerable extent, and they are at present required in such numerous cases, that the inadequacy of the bathing-places existing at present becomes more apparent from day to day.

In consequence of the combined and long-continued exertions of the physicians of Carlsbad, the municipal council has at last decided to construct a large bathing establishment, entirely devoted to the use of moor baths. The new building for moor baths is finished, so that such baths may be taken in the forthcoming season.

The mineral moor used for making these baths is brought by rail from Franzensbad, the municipality

of Carlsbad possessing extensive moor-layers at the latter place.

A moor bath appears as a thin pulpy mass, which is prepared by the mixture of Sprudel water with mineral moor. Four to six cubic feet of mineral moor is considered a sufficient quantity for a bath; temperature of the bath 26-32° R.

*The vapour and douche baths*, both in the Curhaus, are constructed according to the latest and best principles available for such purposes.

*The steel baths* may be had close to the town (not far from the confluence of the Tepl with the Eger), and are fed by a strong chalybeate spring situated near the bath-house.

*The Sauerbrunn baths* are constructed at the other end of the town, five minutes distant. The Sauerbrunn feeding these baths has its offspring in the house itself.

*The river baths* may be taken in the Tepl (private baths), or at the swimming-bath in the Eger.

## REMARKS ON BATHING IN GENERAL.

The question whether the water, together with the other soluble ingredients, really penetrates into the skin of the patient, and thus at least to some extent

acts in a manner corresponding to the internal action of the mineral waters, still remains unanswered. Parisot, who has instituted experiments in this respect, has come to the conclusion that the layer of fat covering the skin, and secreted by the sebaceous glands, renders it incapable of absorption; but he succeeded in obtaining absorption after dissolving those chemical agents he wished to be absorbed, in alcohol, or, what is better still, in chloroform. It is a fact that alcohol and chloroform again render the skin capable of absorption by dissolving the fatty layer covering it, as well as the withered epithelial cells.

It may then be readily understood, that the alkaline water of our mineral baths, after acting on the skin for a considerable time, at last succeeds in dissolving the layer of fat covering its surface, thus removing the obstacle opposing its absorption.

Putting aside this controversy, the beneficial influence on the diseased organism resulting from the use of the baths in general, and the mineral baths in particular, is positively proved by a medical experience of a thousand years or more.

Indeed, it was by this influence that Carlsbad's reputation was first created, as up to the sixteenth century the Carlsbad mineral waters were only used

for bathing, the patients at that time remaining in the bath during the greater part of the day.

The drinking-cures were introduced in the sixteenth century; bathing being then considered as only of secondary importance. Of late years, however, drinking and bathing were both resorted to simultaneously, and this kind of treatment is in general use at the present time.

### SPECIAL REMARKS ON MINERAL, MOOR, STEEL, AND SAUERBRUNN BATHS.

The acting principles of the mineral baths are derived from their temperature, their higher specific gravity, their amount of carbonic acid, and their mineral constituents (principally the alkaline salts).

They are indicated in all diseases where the use of the Carlsbad mineral waters is considered advisable, and the same may be said of the moor baths, their action even being more vigorous, which may be accounted for by their higher temperature, serving as they do at the same time as a kind of poultice (*sit venia verbo*).

The chemical composition of the mineral moor will also enhance its effects; it consists of decomposed mineral and vegetable substances, of

residues of plants, vegetable earth and humic acid, of resins, siliceous earth and clay, of phosphate of protoxide of iron, sulphate of iron, chloride of sodium, sulphates, of carbonic acid, sulphuric and formic acid, all of them powerful elements, acting directly on the skin. Their effects are materially increased by the Sprudel water, which is mixed with the mineral moor for each bath.

Apart from these general indications, the moor baths are especially beneficial in the following diseases:—

1. Neuralgia of various origin, principally when caused by rheumatism and arthritis.

2. Palsy of a lighter degree, caused by disorders in the current of the peripheral nerves, as well as caused by hysteria.

3. Morbid deposits, which have not yet undergone organic transformation.

4. Uterine disorders (not of malignant origin), such as residues of chronic inflammation and amenorrhœa.

5. Tumours of the spleen and enlargement of the liver, which are capable of absorption.

The mineral moor baths, at any rate their methodic use, are contra-indicated only in a very few cases; for instance, if there is an idiosyncrasy against bathing in general, in cases of excessive

nervous irritability, or of morbid changes in the blood vessels.

The Sauerbrunn baths, containing a great quantity of carbonic acid, stimulate the action of the peripheral nerves, thus creating a beneficial influence on the whole of the organism.

The steel baths act in a strengthening and invigorating manner upon debilitated and anæmic individuals, and are principally used in alternation with the Sauerbrunn baths.

### THE GIESSHÜBLER SAUERBRUNN.

The enumeration of the healing agents of Carlsbad would fail to be complete if we were to omit mentioning the Giesshübler Sauerbrunn, which, although in use for centuries past, has been universally and deservedly acknowledged only since the last twenty years. Apart from its extensive consumption at Carlsbad itself, the annual exportation at present amounts to two millions of bottles, and there can be no doubt that, as the Sauerbrunn, in the form of doubly-charged effervescing beverage, has already acquired great popularity in England and its colonies, as well as in France, its exportation will increase considerably from year to year.

For the town of Carlsbad this water is a great blessing. Most patients not being allowed to drink wine or beer, or at the most in very small quantities, and the common drinking water being generally almost unfit for use, it is a great boon that we are enabled to recommend to our patients the Giesshübler Sauerbrunn, which, being a pure alkaline acidulous spring, combines the essential properties of a good drinking water with those of a mild mineral spring.

The Giesshübler Sauerbrunn further ranks first among all similar springs by containing a great quantity of combined carbonic acid, besides its amount of free carbonic acid gas, so that an uncorked bottle of it may be left standing for hours without losing any of its effervescence, provided the bottle is not shaken.

The Giesshübler Sauerbrunn principally acts in removing acidity in the stomach and intestinal tract, causing at the same time an increased secretion of urine.

It is particularly indicated—partly mixed with the other Carlsbad mineral waters, partly as an independent beverage—in cases showing uric acid diathesis, in cases of gravel and stone in the kidneys, and in diabetes mellitus and gout, as recommended by Dr. Garrod.

*PART II.*GENERAL REMARKS ON ALCALINE SALINE  
MINERAL SPRINGS.

I HAVE already quoted the potential agents producing the action of our mineral waters, and, of course, of all other alkaline saline springs—their principal and uncontested representative being Carlsbad ;—I consequently think it superfluous to repeat the observations made in another place, and shall confine my present remarks only to the important springs of Carlsbad, Marienbad and Tharasp,—rich in solid constituents,—no consideration being accorded to the springs of Bertrich, Buda, Füred and Stubnia ; their mineral waters, although belonging to the same category, being considerably less powerful in their action, and not so much in demand. The waters of Marienbad and Tharasp are richer in solid constituents, and principally in drastic salts, than those of Carlsbad, but the great, and I may say incalculable, advantage of the Carlsbad springs is to be found in



their natural temperature, varying from  $23^{\circ}$ – $59.5^{\circ}$  R. ( $85^{\circ}$ – $166^{\circ}$  F.), and in the favourable proportion of their solid constituents. Carlsbad furthermore offers far superior climatic and local advantages. At Tharasp the cure can only be resorted to in the height of summer, when the patients of course may simultaneously enjoy the good effects of the alpine climate; on account however of the restricted number of dwellings, only a limited number of patients can be provided for at one and the same time. Marienbad offers more advantages, the season extending for nearly five months (May to September), and ample provision being made for the simultaneous accommodation of more than 3000 visitors.

Carlsbad in this respect again leads the way; although the official season is over by the end of September, there are many patients resorting to our place even during the winter months, for the sake of deriving health and benefit from its springs, and they find Carlsbad worthily prepared also in winter time to receive them and to make their stay as agreeable as possible. The lodging houses are fitted up so as to give the greatest comfort at all seasons of the year; and the two new colonades, principally the closed Sprudel-colonade, provided with a heating apparatus, affords to the

patients ample opportunity to move about in the fresh air, even in boisterous weather.

The indications for the use of these mineral waters, belonging as they do to the same category, but at the same time differing in several points, are to a certain extent identical, demanding, however, a scrupulous consideration on the part of the medical adviser as well as of the patients themselves, of all the above-named circumstances, the individuality of the respective organism, and the manner of the desired action on the morbid condition, before definitely deciding for any one of these health resorts. There is no doubt, that in cases demanding an energetic action on some particular organ, as on the constitution in general, we should always give the preference to Carlsbad.

COMPARATIVE ANALYTICAL TABLE.

*(No consideration being given to the minimal constituents.)*

16 Fluid Ounces contain Grains.	Marienbad.	Carlsbad.	Tharasp.
Sulphate of soda, . . . .	38	18	16
Chloride of sodium, . . . .	15	8	29
Carbonate of soda, . . . .	10	10	27
Carbonate of lime, . . . .	4	2	12
Carbonate of magnesia, . . . .	3	1	5
Carbonate of protoxide of iron,	0.5	0.02	0.20
Carbonic acid in cubic inches,	22	17	32
Temperature, . . . . .	8° R.=22° F.	59.5° R.=166° F.	5° R.=14° F.

*PART III.*

## A.—GENERAL INDICATIONS.

THE Carlsbad mineral waters are generally prescribed in cases of abdominal complaints, with the exception of acute fevers, malignant degenerations and tumours; they are further indicated in constitutional ailments, such as chlorosis, adiposis, gout, malaria, diabetes.

Many authors and practitioners also mention different diseases of the respiratory organs as suitable for Carlsbad, such as catarrhal affections of the throat, larynx, bronchial tubes, attended with abundant mucous secretion; certain forms of emphysema are considerably relieved, and the same is said of beginning fatty degeneration of the muscle of the heart. According to my opinion, however, these conditions may be taken into consideration so far as they show themselves in consequence of abdominal plethora, liver complaints, &c., &c.

This is the case also with people suffering from

the eyes, who are sent to Carlsbad, as their illness can only be relieved by first attempting to cure their abdominal complaints.

Apart from the cataracta lentis, developed in consequence of diabetes, which by a cure at Carlsbad is often improved or at least stopped in progress, we may principally mention chronic irritation of the conjunctiva and of the meibomian glands, amblyopia, amaurosis, and glaucoma, caused by abdominal plethora, or by a morbid state of the blood (viz. gout), and progressing further on account of the primary disease not being properly treated.

#### B.—SPECIAL INDICATIONS.

1. *Chronic catarrhal affections of the stomach*, or the second stage of acute catarrhal affection, caused by a too abundant supply of food, or by food of bad quality, by abuse of spirits, hot spices, irritating drugs, by catching cold, nausea, mental anxiety, &c., &c.

The combined effects of these circumstances are various, and principally consist in complaints of fulness and pressure in the epigastric region, dyspepsia, loss of appetite, vomiting (principally in the morning—*vomitus matutinus*), headache,

general debility, nervous depression, and often want of sleep.

The tongue generally is more or less furred, and there is sometimes a metallic taste perceptible on the tip of the tongue and *fœtor ex ore*; constipation is mostly prevalent. If this state continues for any length of time, the patients become greatly emaciated, and often present a grey or yellowish-grey colour of the skin.

Some medical men think that the mineral waters of Carlsbad are indicated neither for patients in the last-mentioned state, nor for those suffering from the atonic form of *catarrhus ventriculi*. I cannot, however, share this opinion; from my personal experience, on the contrary, I am happy to state that I have obtained remarkable results in these cases (of course not accompanied by organic derangement), by a treatment quite in opposition to that usually applied in cases of catarrhal affections of the stomach; by substituting a different diet, and principally by directing them to use the waters in a different way. These must be taken in a cooler state, and only in minimal quantities of from three to six ounces, twice daily. Should constipation set in, Carlsbad salts and all other purgatives are to be avoided, and only cold injections to be used.

The catarrhal affections of the stomach frequently extend into the duodenum (catarrhus gastroduodenalis), and further into the larger, and in long-standing cases also the smaller biliary ducts, so that stagnation of the bile and jaundice supervene. It is evident that Carlsbad is especially indicated in such cases, and the use of its waters attended with the greatest success.

2. *Dilatatio ventriculi*, as a primary disease, shows itself in consequence of continued overloading of the stomach with heavy, indigestible food, or in a secondary manner in consequence of ulcerations in the pylorus, and frequently as the result of long-standing catarrhal affections, the latter appearing also frequently in combination with the dilatation; hence the symptoms are only partly of an independent nature, such as vomiting of undigested or fermenting food, having a faecal smell, or bringing up food that has been swallowed a long time ago; mostly all the symptoms coincide with those of the chronic catarrhal affection.

On minute and careful examination, the distension of the stomach may be detected from without, and proved by palpation and percussion; however, it will be found advisable in all cases to ascertain the truth of the diagnosis by introducing effer-

vescing drugs, or by sounding the stomach with the probe.

It is evident that a complete restitution, in integrum, can only be expected in light cases of not long-standing order. In severe or protracted instances Carlsbad will only act as a palliative, and will confine its healing effects principally to the accompanying catarrhal symptoms. In all cases of dilatatio ventriculi, while directing the patients to drink the waters, I make use of the stomach pump, as it is imperatively necessary, to rid the stomach once daily from the stagnating remnants of the food, as well as from the tough mucous secretion, so as to stimulate and strengthen its peristaltic action.

3. *Cardialgia* is more frequently the symptom of another disease than an independent form of neuralgia. This last-mentioned kind—to which I allude only—is almost as frequently met with in the male as in the female, and is characterised by a spasmodic contraction of the walls of the stomach, combined with severe pain (according to many patients' expression, as if the stomach was squeezed by an iron hand).

The cramp generally sets in suddenly, even when the stomach is empty, without apparent reason and at any time in the day, or after catching cold, after

eating ices or drinking iced water, after mental anxiety, &c., &c., and generally concludes with vomiting of slimy and often sour liquids, mixed with bile if the retching lasts long.

This spasmodic contraction is not confined to a certain place, but generally affects the stomach in its entire circumference; sometimes it may be relieved by a firm pressure on the epigastric region, or by the swallowing of some solid food. As soon as cramp and pain are gone, the patients again feel perfectly well. The origin of this complaint cannot always be ascertained; in most cases it is caused by overacidity, or by pressure of the left lobe of the liver, and it is not always accompanied by chronic catarrhal affections. The effect of the Carlsbad mineral waters, especially of the Sprudel (two to four half tumblersful daily), in such cases of genuine cardialgy, is miraculous.

4. *Ulcus ventriculi* is more frequently met with in the female; it is caused either by already existing erosions in the mucous membrane of the stomach, or is of independent origin in consequence of local disorders, or of a general derangement of the system. Developing further, the ulcer causes erosions of the blood-vessels, bleeding, and eventually (though not very often) perforation.



The symptoms of *ulcus ventriculi* are very conspicuous, and consequently the diagnosis is difficult only in a very few cases. Apart from the idiopathic symptoms, such as constant pain at the seat of the ulcer, which is increased by the slightest pressure, and invariably irradiates towards the spine; vomiting of every particle of food, and extreme exhaustion resulting therefrom; in some instances the characteristic sanguinolent vomiting, accompanied by bloody, tarlike motions; anæmic complexion; it is almost always accompanied by catarrhal inflammation of the stomach, and by constipation of the bowels.

Cases of *ulcus ventriculi* are often met with at Carlsbad, and their treatment by the mineral waters is attended with the best results. The careful regulation of the diet, also, with regard to the quantity of the food is of the greatest importance.

The cooler springs only are applicable in these cases (Markt, Kaiser, and Mühlbrunnen), in moderate quantities (three to six half tumblersful), and at intervals of half an hour: ought to be used during at least five or six weeks. During the second year, or if at any time there is reasonable ground for believing that the ulcer is entirely healed, the hotter springs may be used with advantage, especially against the

neuralgic pains frequently caused by cicatrisation. In case there should be any bleeding from the stomach during the time of the cure, the use of the waters must, of course, be at once dispensed with for a shorter or longer period of time, according to the violence of the bleeding; perhaps even be left off entirely, and local treatment is then to be substituted.

I have had under treatment more than two hundred cases of ulcer in the stomach, but have only in one single case met with a slight bleeding, showing itself twice during the first fortnight of the cure; the latter, altogether extending over forty-five days, was attended by the best results; other symptoms of very little importance, and resulting principally from the effects of the cicatrisation, which showed themselves during the following winter, were entirely cured by a repetition of the cure at Carlsbad. The lady, who has since given birth to two children, is now in perfect health.

5. *Obstructio alvi.* Habitual constipation of the bowels often reaches a dangerous degree by being neglected at first, or by not having been treated in a proper manner. This malady, often tolerated by the system with apparent impunity for years together, gradually increases in severity, and at last

may lead to all kinds of derangement of the circulation, to swelling of the liver, and even to dangerous local inflammations.

Under this head we also may include the constipation which frequently exists while the bowels apparently act in a sufficient and regular manner. We often meet people whose bowels act daily, or at least every other day, passing, however, only a very small quantity of fæces each time; these patients are generally extremely astonished by being told by their medical attendant, after a careful examination has been instituted, that their intestines are filled with hard fæcal masses, and that this is the cause of all their sufferings.

The usual symptoms of chronic intestinal obstruction are: difficulty of breathing, palpitations of the heart, a feeling of oppression and tension in the abdominal region, swimming before the eyes, headache, mental depression, and even melancholy, &c., &c.

The constipation is most frequently caused by neglect, by sedentary life, by drinking too little water, by long-standing affections of the biliary ducts, by the abuse of strong purgatives, and in the female very often by repeated pregnancies.

The use of the mineral waters at Carlsbad, during

one or more years, is in all such cases followed by regular motions, but all such patients should be earnestly admonished to repair to the water-closet daily, and at a fixed hour, even though they should not feel a natural inclination to do so.

6. *Chronic intestinal catarrh* is a disease also frequently met with at Carlsbad, and it seems wonderful, indeed, that two antipodes such as constipation and obstinate diarrhœa should be entirely curable in one and the same locality, and often by the use of one and the same spring.

Chronic intestinal catarrh is caused by repeated colds, by damp feet, by long-standing exhausting illness, by habitual constipation, and by the abuse of purgatives.

These patients mostly suffer from tenesmus, with no feeling of relief even after emptying their bowels every half hour. The evacuations are always of a thin and slimy character, containing hardly any consistent fæces, and very little bile.

It is quite characteristic that the tenesmus often appears so suddenly that the patients scarcely have time to reach the proper place.

Gripes and flatulence are also conspicuous in such cases.

After minutely examining these patients, we often

detect old dried-up fæces strongly adhering to the intestinal walls, principally of the cœcum; on this account, as well as for the sake of freeing the bowels of their viscid contents, I have made it a rule in such cases to begin the treatment by administering a mild purgative, such as castor-oil. The use of the mineral waters after this proceeding is generally attended with a quicker and more lasting result.

I have during the last three years attended upon five cases of chronic catarrh of the large intestine, deserving a special enumeration on account of their scarcity; I shall however confine my remarks in this place to a general description, leaving a more minute narrative for a later publication. In the cases just referred to (and they all occurred in female patients) the catarrh was situated in the transverse colon, the flexura sigmoidea, and partly also in the colon descendens. The cause in two cases was dysentery, in three cases constipation, existing for years (*i.e.*, most likely already developed intestinal catarrh of a lighter order). The symptoms—of course varying in intensity—were as follows:

Swelling of the lower abdominal region, associated with pain, corresponding accurately with the site of the colon; frequent tenesmus, but no evacuations without resorting to strong purgatives; piles; chronic

inflammation of the sexual organs, accompanied by irregular and abundant menstrual discharges; catarrh of the stomach; restless nights with heavy dreams; general emaciation and psychological depression. The evacuations contained only some extremely hard and lumpy fæcal masses, but a great deal of glairy slime (enveloping the lumpy fæces), and large quantities of a skinny substance, which microscopically I at first thought to be pieces of necrotic mucous membrane. Under the microscope, however, I detected a gelatinous, structureless mass and some intestinal epithelium; this discovery, as well as the chemical analysis, proved beyond a doubt that these substances consisted of intestinal mucus, forming, as it were, an imprint of the mucous membrane. These severe cases of intestinal catarrh are fortunately of rare occurrence, and unless diagnosed in proper time and treated accordingly, may lead eventually to ulceration and perforation of the intestinal tract. Strong drastic remedies are contra-indicated, as they would certainly aggravate the symptoms. I have in these cases had recourse to a careful and long protracted cure with the Carlsbad waters, and besides to injections of a tepid slimy infusion (*infus. sem. lini.*) per anum by means of an irrigator, and have seen very good results from adopting this method.

7. *Congestion of the liver* is often met with, and if of long duration, may lead to textural disease of the organ. We have only to consider the passive congestion, caused by emphysema, stagnation in the mesenteric vein, constipation, and other functional disorders of the abdominal viscera. The liver is generally painful to the touch and more or less enlarged, principally in its left lobe.

8. *Hepar adiposum* is caused by the accumulation of globules of fat in the liver cells, and consequently the function of the organ is seriously interfered with.

We only consider these cases of fatty degeneration of the liver, occurring in individuals otherwise healthy and well-fed, and caused by good living, the abuse of spirits (gin-drinker's liver), and a general tendency towards obesity. The liver in such cases is enlarged in its entire circumference, its edges have lost their normal sharpness; there is no pain, but by the pressure exercised on the stomach and the adjacent organs, a sensation of weight and tension usually is experienced in the epigastric region (the "iron girdle"), accompanied by difficulty of breathing, dyspepsia, &c., &c.

*The amyloid degeneration of the liver* is to us of interest only so far as it causes disorders in the

digestive system, which may be improved by the use of the Carlsbad mineral waters; but even such improvements are merely of a temporary nature, as it is impossible to remove the primary cause of the evil.

9. *Cirrhosis of the liver*, in its first stage, may be benefited by a cure at Carlsbad; but our mineral waters are certainly contra-indicated in the second and third stages; and the same may be said with regard to syphilitic degenerations and malignant tumours of the liver.

10. *Polycholia*, or a superabundant secretion of bile, associated with an insufficient discharge of this fluid, the obstacle not appearing in the biliary ducts, but caused by a want of pressure, which impedes the regular flow of bile into the intestinal canal.

The stoppage first shows itself in the gall bladder, which becomes distended, and may sometimes, by external palpation, be felt as an elastic tumour. By degrees a lasting expansion is brought about, continuing even as far as the biliary ducts. In some cases the accumulated secretion is now and then evacuated, either by vomiting or by purging; and, in default of this, jaundice, organic disorders of the liver, thickening of the gall or gallstones, may eventually develop.



11. *Cholelithiasis*. The formation of gallstones is met with very often, in consequence of many and various causes, and occurs more frequently in the female.

As the shape and nature of gallstones are sufficiently well known, it may suffice to mention that the smallest concretions may cause the same grave symptoms as the larger kinds; on the other hand, it is a well-known fact that stones, as long as they sojourn in the gall-bladder, cause little or no uneasiness at all, and often are detected accidentally at *post-mortem* examinations, the subject not having experienced any inconvenience whatever during lifetime.

These concretions may be caused by anything that impedes or obstructs the regular stream of the bile, such as habitual constipation, pregnancy, repeated disorders of the biliary ducts, &c.

There is no decided proof whatever to support the opinion that the beneficial results brought about by the use of the Carlsbad waters in these cases are due to any dissolving action on their part. I have repeatedly and for some considerable time exposed gallstones to the action of hot Sprudel water ( $60^{\circ}$  R. =  $167^{\circ}$  F.) without noticing any mechanical changes whatever; besides it is, *a priori*, quite incomprehensible how the mineral water should act in a direct way on the

concretions formed in the gall-bladder or the biliary ducts. On the other hand, the possibility of the bile itself acting in a destructive manner on the concretions, after becoming alkaline to a certain extent, cannot be denied altogether; at least, it is certain that we frequently meet with corroded concretions of a porous construction, and sometimes even crumbled to pieces, in patients who have been drinking the waters for a considerable time. A similar process, as we all know, sometimes takes place in some cases of urinary concretions.

At any rate, the disappearance of the stones is not due to their being dissolved, but it may safely be asserted that their elimination is caused by the mechanical action of the waters; their importance, moreover, is evidently shown by the thinner and normal condition of the bile showing itself during their use; thus the formation of fresh concretions is evidently prevented.

The regulation of the action of the bowels, brought about through the use of the waters, naturally ranks first in these cases, and it will, in consequence, be found advisable for such patients to repeat the cure for several consecutive years.

Although the structure of the ductus choledochus allows of a good deal of expansion, and thus small

stones may pass through it without much inconvenience, yet larger stones or the simultaneous formation and elimination of several calculi usually cause the severest colic and grave symptoms which, although not menacing life itself, may eventually lead to very critical conditions (hepatitis, perihepatitis).

According to experience, such colics most frequently occur during the time of the cure at Carlsbad, and it is obvious that in consequence of the imbibition of large quantities of water, there is a tendency towards the elimination of the stones, and this again gives an increased chance for their incarceration; the same reason may be assigned in those cases where we see stones being passed repeatedly during the use of the waters at Carlsbad.

The colics are usually followed by jaundice of variable intensity. This symptom, which disappears a few days after the cessation of the incarceration, is of the greatest diagnostic importance.

The diagnosis may also be considerably strengthened in cases where gallstones can be detected in the evacuations of the bowels, but the latter proof is not absolutely necessary for forming the diagnosis. The diagnosis of gallstones is as easy as it is difficult; this sentence may appear paradoxical, but never-

theless it is perfectly true; in some cases showing the whole series of well-known symptoms, and favouring us perhaps with the detection of gallstones in the evacuations, passing away after some severe attack of colic, the diagnosis may easily and accurately be formed. On the other hand, every experienced practitioner will attest that there are lots of cases wanting in some of the most important symptoms, and showing morbid appearances indicating quite different diseases, thus rendering the diagnosis extremely difficult, or even altogether impossible.

I remember one case, concerning the wife of a physician, and showing a series of symptoms, indicating everything else rather than cholelithiasis. The lady had consulted nearly all the medical celebrities of Germany, and almost every one of them had expressed a different opinion. They had, however, unanimously denoted the ultimate prognosis as highly unfavourable. At last, as an *ultimum refugium*, she was recommended to try the effect of the Carlsbad waters.

The patient, having attained the climacteric period of life, presented a very cachectic appearance; was extremely nervous and suffered from want of sleep; brought up every particle of food, and her bowels could only be brought to act by means of strong,

drastic remedies, the evacuations presenting a normal colour, and a pulpy consistence, followed, however, constantly by most acute pains in the mesogastric region, sometimes of an eclamptic character. At the same time she complained of an unquenchable thirst and a salty taste on her tongue, and of constant piercing pains in the back, situated just opposite the epigastrium. On examining the abdomen I thought I felt a tumour in the depth of the epigastric region, emanating, according to my opinion, from the pancreas; the liver showed normal limits; jaundice had never been noticed; the urine contained great quantities of urates and traces of sugar. The diagnosis I formed was: Carcinomatous degeneration of the pancreas (I heard later on that the same diagnosis had been formed by two other colleagues), and although, or rather because I had given up all hope of recovery, I conformed to the urgent wishes of the patient, and advised her to drink the Sprudel (six tumblersful daily) for four weeks. The patient, whose above-mentioned symptoms became more and more aggravated, grew weaker from day to day, her condition when she returned home being much worse than at the time of her arrival at Carlsbad.

To my great surprise I received a letter from

her husband, after the lapse of several months, saying that after her return from Carlsbad, the patient had, during three weeks of most agonising pain, been wavering between life and death, until at last, simultaneously with a spontaneous copious evacuation, she passed a great number of gallstones of the size of a bean, and that from this moment a rapid improvement had taken place, leading to her ultimate complete recovery.

This case will demonstrate sufficiently how difficult, nay even impossible, it may be in some cases to diagnosticate gallstones; convincing us however at the same time of the mighty curative power of an energetically conducted Carlsbad cure, and of the impossibility of its being replaced by any other remedy whatsoever.

The non-appearance of jaundice, although of rare occurrence, or the fruitless exertions of detecting concretions, must not deter us from diagnosing gallstones, in case the remainder of the symptoms are in favour of this ailment. Any one who has attended upon hundreds of similar cases, will have no difficulty in forming a pretty accurate diagnosis, even in those instances which are characterised by only very minute concretions (the so-called gall gravel); the colics and other symptoms

in such cases, of course, do not appear in a conspicuous manner; still they will not escape the eye of a careful observer, who can easily distinguish them from other morbid conditions, presenting similar appearances.

12. *Tumours of the spleen.* We restrict our observations to such swellings of the spleen, which may allow of a reduction to its normal size, and which are caused by disorders of the abdominal circulation, by malaria, or by the influence of unseasonable and hot climates. Such cases strongly indicate the use of the Carlsbad mineral waters, as the spleen is the starting-point whence the deleterious poison may spread over the whole of the organism, and if help is not sought for in time, it may soon be altogether too late.

13. *Albuminuria*, not originating in diseased kidneys, but caused by deranged abdominal circulation, or by general debility. The use of the Carlsbad mineral waters in such cases consists in relieving the dropsy by simultaneously attacking and curing the primary disease itself.

14. *Gravel and catarrhal affections of the kidneys.* The formation of stone in the kidneys, and gravel, more frequently met with in the male, is caused by the superabundant secretion of some of

the solid urinary constituents. These soon become precipitated into the renal tubes and the renal cavity, and thus contribute towards creating gravel or larger stones. The latter soon lead to bleeding from the kidneys, and when passing through the ureters are the cause of those violent spasmodic pains which are best known under the name of renal colic. Bleeding from the kidneys is not a rare occurrence, although I have never seen any bad consequences resulting therefrom. It is hardly necessary to interrupt the cure on this account, the patient only requiring rest and abstinence from bathing. The cooler springs only should be used in such cases, mixed with some whey.

The Carlsbad mineral waters are strong enough to dissolve the gravel deposited into the renal tubes, and by increasing the urinary secretion, mechanically to propel, and eventually to eliminate even larger calculi.

The repeated use of the Carlsbad mineral waters is of such beneficial influence upon the circulation and formation of the blood, that, together with a well regulated diet, the new formation of stone and gravel will be most securely prevented.

The concretions have an irritating influence upon the renal cavity, which may bring on inflammation.



After the elimination of the stones, however, and through the beneficial action of the Carlsbad waters, this affection will soon disappear again.

15. *Catarrh of the bladder* will be relieved by the use of the Carlsbad mineral waters only if unaccompanied by fever, the urine at the same time showing the acid, or, at most, neutral reaction; in these cases no local treatment is required. This form of vesical catarrh is caused by cold, by drinking badly fermented beer or iced water, and by gravel and stone in the bladder.

If the stones are of a small size, the increased secretion of urine will suffice for their removal; if they are so large that they cannot pass through the urethra, they will have to be operated upon before the commencement of the cure. There is no reason for cherishing the hope that the mineral waters of Carlsbad may succeed in dissolving stones of so large a size, and the cure will prove entirely useless, as the bladder is constantly being irritated by the presence of the stones; consequently these patients ought not to be sent first to Carlsbad, and afterwards operated upon, but just the contrary ought to be insisted upon. If, however, decomposition of the urine should set in, accompanied by alkaline reaction and a putrid sediment, local treatment is indicated

from the first, and the Carlsbad waters should only be recommended if, according to careful examination, there is little or no pus in the sediment, the urine showing at least a neutral reaction.

16. *Hypertrophy of the prostate* is met with principally in people of mature age, or in consequence of gonorrhœa, but may as well occur in very stout persons quite unconnected with the first-mentioned circumstances; it is a favourable object for a cure at Carlsbad.

17. *Inflammatory deposits in the peritoneal cavity* have only of late been considered with regard to the salutary effects of the waters at Carlsbad, these having been of great benefit in some cases of this kind. These residues of inflammatory action must, however, not be too large, their nature being capable of absorption; such as deposits following an attack of perityphlitis, para- and peri-metritis.

The use of the waters in almost all these cases is attended with splendid results.

18. *Anæmia*. It may seem strange, at the first glance, to name anæmia among the diseases curable at Carlsbad, but the assertion is true, nevertheless, if considered in proper limits, and not in a general manner.

The number of patients suffering from poverty of

blood, and yet resorting to Carlsbad, is very considerable, and naturally there may be some cases among them not suitable for our mineral waters.

Catarrhal affections of the stomach, *ulcus ventriculi*, habitual constipation, are often followed by *anæmia*, the latter subsiding, however, as soon as the primary affection, indicating the cure at Carlsbad, is relieved. Of course I am not speaking of these kinds of *anæmia*, as the principal indication for the cure at Carlsbad is based upon the primary disease, and not upon the poverty of the blood.

We have only to consider that kind of *anæmia* which is known as the *anæmia attendant* upon the age of puberty, its name plainly showing its origin.

But even the latter affection will not be benefited indiscriminately by the use of the Carlsbad waters, and it is imperatively necessary to select the individual cases with the greatest possible care and consideration, as regards the accompanying symptoms.

Such cases mostly occur in girls fifteen to twenty years old, whose menstruation has not shown itself at all, or only in very minute quantity. Such patients may safely be sent to Carlsbad, if otherwise properly built, and if, besides showing the usual symptoms of *anæmia*, they suffer from disorders of the abdominal circulation, chronic inflammation or congestion of the

womb, catarrhal affections of the stomach, constipation of the bowels, moderate enlargement of the liver, mental depression, want of sleep, &c., &c., they will be entirely cured by our waters, as I am happy to state from a large experience in such cases.

19. *Adiposis*,—viz., that kind of general derangement of the alimentary system, consisting in the abnormal and superabundant formation of fatty tissue, and its accumulation in the areolar tissue of the skin, as well as in different other organs of the body.

This disease may be caused—or, if already in existence, increased in severity—by too good living, combined with insufficient bodily exercise, but it may also be developed independent of any such causes, as is proved by a great many cases. It may also have hereditary predisposition, and in the female sterility and the change of life, for its origin.

The symptoms are : an enormous increase in size, verging upon monstrosity, difficulty in walking and moving about, a pale and puffy countenance, and a disordered state of the intellectual functions.

In the latter stages of adiposis we see functional disorders of internal organs, such as difficulty of breathing, palpitations of the heart, affections of the brain, and, in many instances, diabetes mellitus.

20. *Malarial Cachexy* principally develops itself in some of the tropical countries, in consequence of ague, yellow fever, and the so-called bilious fever, but it may also occur in Europe in the swampy parts of Italy, Hungary, and Holland.

Patients suffering from malarious fever have a characteristic yellowish-grey complexion, they are generally emaciated, and may also become dropsical, in case the disease has been progressing to a certain extent.

There is enlargement of the spleen, and sometimes also of the liver, and frequently the kidneys are deeply affected. The disease is generally accompanied by chronic catarrhal affections of the stomach, and very often by intestinal disorders.

I have attended upon many cases of this kind at Carlsbad, and have always seen good results from the use of its waters. A corresponding after-cure, particular attention being devoted to the enjoyment of a fresh and pure air and strengthening diet, and a repetition of the cure at Carlsbad, will be found advisable in all such cases.

21. *Gout*. This disease, showing itself in a regular or irregular manner, and in various forms, is more frequently met with in palaces than in humble dwellings.

Hereditary predisposition and luxurious living, as well as the abuse of alcoholic beverages (wine and strong beer, ardent spirits) are most frequently found at the root of this evil, and trifling injuries may often suffice to develop the disease, lurking in the organism for some time past.

Although we are not entitled to speak of premonitory symptoms or forerunners of the gout, still there are some signs which lead us to the conclusion that some patients, whose antecedents we know, may eventually become gouty, principally, if there is a possibility of hereditary predisposition. Such patients mostly complain of general debility, restless nights, palpitations of the heart, asthma; they suffer from abundant perspiration, having an acid smell, and have a full but irregular pulse; their urine, as a rule, is scanty and concentrated, and shows a great quantity of urates. If proper treatment is not soon resorted to, an attack of gout is sure to manifest itself in a very short time.

Gout is caused by a uric acid diathesis of the system; if the kidneys are not enabled to remove the superfluous uric acid (*i.e.*, if their passage is rendered impervious to a certain extent by uric acid precipitates), it will at last (as the *materia peccans* of our ancestors) be deposited by the blood into the different

organs of the body ; at first into certain joints, and afterwards into organs of a higher order.

Some clinical teachers seem to think that the use of the Carlsbad waters is only indicated in such cases of gout resulting from abdominal plethora.

According to my experience, I am bound to say that Carlsbad is not only indicated in *all* cases of gout, but that the use of its waters is attended with the most remarkable results. It is necessary, however, that the cure should be watched with great care in all cases affecting weak and debilitated individuals, or if there is already disease of the kidneys, or if there is an affection of the arteries or arterioles.

Gouty deposits, capable of absorption, will generally disappear during or soon after the use of the Carlsbad waters, but the latter have no influence whatever on chronic indurations.

In most cases it will be found advisable, after the use of the waters, to recommend to the patients a so-called after-cure at Wildbad, Gastein, Ragaz, Toepnitz, Wiesbaden, or Aix-la-Chapelle.

22. *Diabetes mellitus.* This mysterious disease, deservedly occupying the careful attention of the medical profession, will for a long time to come be the subject of an important controversy, although

much has been contributed during the last twenty years, and principally by Carlsbad physicians, towards its elucidation.

It was Hufeland who at first designated diabetes as a fit object for a cure at Carlsbad. Since that time the patients afflicted with it betake themselves to Carlsbad annually, in ever-increasing numbers, and our place is called "the great hospital for diabetes."

It was found impossible hitherto to demonstrate any constant pathological changes at the *post-mortem* examinations of the diabetic people.

Numerous observations, published by medical authors, have shown that this disease is not of so rare occurrence as it was formerly believed to be; although it may be taken for granted, that the altered circumstances of modern time and life are instrumental to some extent in causing its present frequency.

Diabetes shows itself more frequently in the male, and attacks almost any age; it is mostly met with in people ranging from twenty to fifty years, less frequently in children, and very seldom in old age.

I have lately had occasion, at the hospital of Dresden, to see two cases of diabetes, in children of an age previously unknown to me, as subject to the



disease; they were brothers, at six and seven years respectively.

Dr. Seegen says, and I have made the same observation, that amongst all his cases of diabetes, the percentage ranged highest with the Jewish race; this may perhaps be accounted for by their mode of living, their constant activity, and their increased mental irritability.

#### CAUSAL INFLUENCES OF DIABETES MELLITUS.

1. Injuries directly affecting the brain or the liver.
2. Spontaneous diseases of the brain.
3. General disorders of nutrition.
4. Chills and exposure to damp weather.
5. Continued excess in baccho et venere.
6. Mental diseases (the most frequent cause).

The greatest number of cases of diabetes which I have attended upon, occurred during and after the late Franco-German war, and during the commercial crisis of 1873-74.

7. Hereditary predisposition.

Abundant accumulation of fatty tissue is considered by some authors as predisposing to diabetes; according to my opinion, adiposis may very well be

classified under No. 3. The symptoms, which are not always present, however, in their full combination, are as follows :—

- (1.) Excessive secretion of urine, containing *sugar*.
- (2.) Abnormal increase of thirst, and generally of appetite, too ; a peculiar fœtor ex ore.
- (3.) Dryness of the skin, loss of hair and teeth, general emaciation, a feeling of faintness ; in one word : marasmus præcox.
- (4.) Itching of the skin, eczema, principally in the region of the generative organs, tendency to furuncles and carbuncles, caused by want of resistance in the tissues.
- (5.) Mental depression, various disorders of the nervous system, decreased activity of the senses, caused by affections of their respective organs ; impotence.

The influence of the Carlsbad mineral waters on diabetes is highly beneficial, according to the unanimous opinion of medical men in general, and of those practising at Carlsbad in particular, and is based on the experience of the last fifty years.

In every case of diabetes, even of the greatest severity, a marked improvement in the desolate condition begins after a few day's time. At first the intolerable thirst and the parching of the mouth is

considerably relieved; the patient is getting more rest, and may enjoy a quiet sleep for several hours; this is accompanied by a diminution, or, at least, temporary cessation, of the regressive tendency.

In lighter cases the effects produced by the use of our waters are even more striking, and at the same time lasting; in such cases all diabetic symptoms gradually disappear altogether, even the impotence; the patients at last enjoying the long-wished-for good health. The power of resistance is in many cases strengthened to such an extent that a mixed diet, at least for a certain time, may be resorted to, without any striking relapse taking place; a yearly return to Carlsbad, however, will become absolutely necessary for these patients.

I know of diabetic persons, who have visited Carlsbad annually for twenty years or more, enjoying tolerably good health, although not living exclusively upon animal diet, their urine containing sugar only from time to time.

The question whether diabetes may be entirely cured by the Carlsbad mineral waters, or by some other remedies, remains undecided at present, and according to the experience hitherto attained, is not likely to be answered in the affirmative.

I have in my own practice met with two cases

which, perhaps, may be considered as perfectly cured. I may just be allowed to relate them in a few words.

In the year 1871 I attended upon a tavern-keeper of Weimar, suffering from the *light* form of diabetes, and presenting almost all the usual symptoms, which, however, under proper treatment at home, had undergone a favourable change. While drinking the waters, the rather considerable quantity of sugar contained in his urine, as well as the other diabetic symptoms, entirely disappeared.

I have since had the opportunity of seeing this man on repeated occasions, he having, during the time of the cure, already improved in weight (5 lbs.), and have received, through his family doctor, several accounts respecting his health. There has been no trace of sugar in the urine since, and he feels perfectly well up to the present time.

The second case is that of a merchant from Frankfort on the Maine, who still comes to Carlsbad every year. During the first year his urine contained a great quantity of sugar, all the other symptoms of diabetes being apparent; after using our waters during six weeks, the symptoms entirely subsided. During the second and third year the urine on his arrival contained sugar in moderate

quantities (about two per cent.), the other symptoms being less numerous and less marked, compared with the first year. During the last three years, however, I could not detect any more sugar in his urine, and the man is in the enjoyment of perfect health.

I relate these cases, which at a future date I shall publish in detail, together with many others, without, however, drawing any conclusions from them.

23. *Diseases of the skin* only have to be considered so far as they are connected with stagnation of the blood or with disorders of the abdominal organs, and there is no doubt that the regulation of the circulation, and the amelioration of the debilitated constitution will have a beneficial influence on the healing of some diseases of the skin, constituting, in fact, the necessary conditions for their entire cure.

The use of the Carlsbad waters may especially be recommended in cases of:—

(a.) Erysipelas migrans, principally if the patients show a constitutional tendency to this affection.

(b.) Sclerosis of the skin, showing itself on the calves of the legs, in consequence of repeated attacks of erysipelas.

(c.) Urticaria.

(d.) Pemphigus, especially in its milder forms.

(*e.*) Eczema, likewise in the milder forms.

(*f.*) Morbid tendency to furuncles, so frequently met with, unconnected with diabetes mellitus.

### C.—CONTRA-INDICATIONS.

The use of the Carlsbad mineral waters, although apparently indicated by the aforesaid conditions, may under certain circumstances, however, prove decidedly injurious, and necessary as it was clearly to state the indications for their use, it will be of equal importance to point out also their contra-indications, which of course will only arise in such cases, which at first presented an indication for the use of our waters.

The use of the Carlsbad mineral waters is not indicated:—

1. In all the above-mentioned diseases, in case they should be accompanied by strong fever.

2. If there is a simultaneous occurrence of disease of the brain or the spinal cord, of tuberculosis, of valvular disease of the heart, of affections attacking the great blood-vessels, of Bright's disease of the kidneys, or of malignant degenerations in any of the organs of the human body.

It is a well-known fact, that the use of our mineral waters may accelerate the fatal issue in patients suffering from malignant tumours and other degenerations. This sad occurrence has most frequently taken place in cases of cancer of the stomach and the liver, the formation of a proper diagnosis at the first instance having proved utterly impossible.





