

The new methods of cure at the hot mineral springs of Bath : with especial reference to the Nauheim system as practised at the baths of Bath / by Henry William Freeman.

Contributors

Freeman, Henry William, 1842-1897.
Griffiths, L. M.
University of Bristol. Library

Publication/Creation

Bath : "Chronicle" Office, 1897.

Persistent URL

<https://wellcomecollection.org/works/fefhbrvb>

Provider

Special Collections of the University of Bristol Library

License and attribution

This material has been provided by This material has been provided by University of Bristol Library. The original may be consulted at University of Bristol Library. where the originals may be consulted.
This work has been identified as being free of known restrictions under copyright law, including all related and neighbouring rights and is being made available under the Creative Commons, Public Domain Mark.

You can copy, modify, distribute and perform the work, even for commercial purposes, without asking permission.



Wellcome Collection
183 Euston Road
London NW1 2BE UK
T +44 (0)20 7611 8722
E library@wellcomecollection.org
<https://wellcomecollection.org>

THE NEW
METHODS OF CURE
AT THE
HOT MINERAL SPRINGS
OF
BATH



BY
HENRY W. FREEMAN,
F.R.C.S.

150850527X

UNIVERSITY OF BRISTOL.

Medical Library.

PRESENTED BY

Dr L. M. Griffiths Bequest

1924

SHELF

4

D.A.

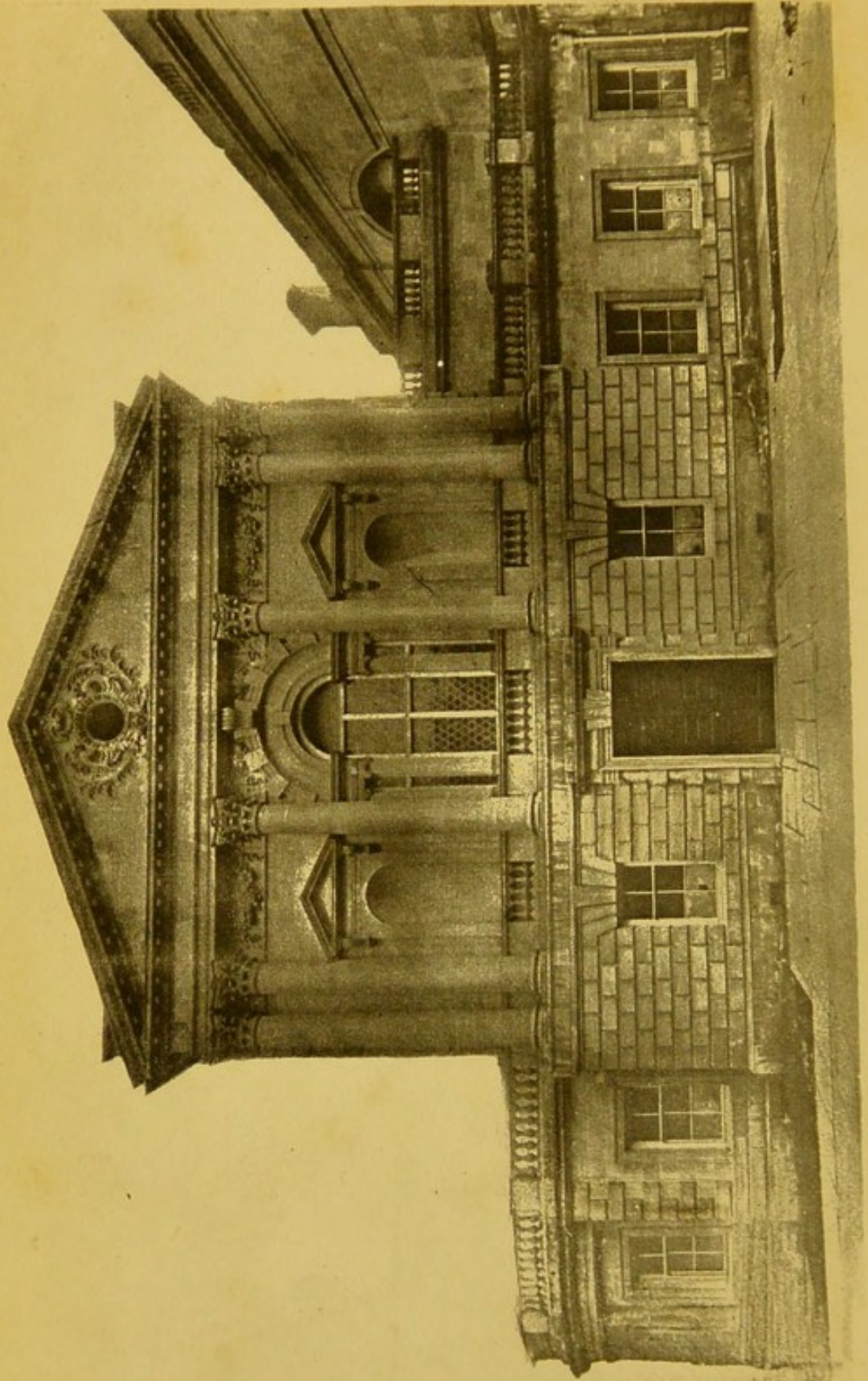




Digitized by the Internet Archive
in 2015

<https://archive.org/details/b21440165>

UNIVERSITY
OF BRISTOL
MEDICINE



THE NEW KURSAAL AT BATH.

S. Williams

Entered at Stationers' Hall.

THE
NEW METHODS OF CURE

AT THE
HOT MINERAL SPRINGS

OF
BATH;

WITH ESPECIAL REFERENCE TO THE
NAUHEIM SYSTEM AS PRACTISED AT THE
BATHS OF BATH.

BY
HENRY WILLIAM FREEMAN,

*Fellow of the Royal College of Surgeons in Ireland, Member of
the Royal College of Surgeons in England, Licentiate of the
Royal College of Physicians in London,*

AND
SURGEON TO THE ROYAL UNITED HOSPITAL BATH.

PRICE ONE SHILLING.

BATH:
"CHRONICLE" OFFICE, KINGSTON BUILDINGS.
1897.



Knowledge and wisdom far from being one
Have oft times no connection,
Knowledge dwells in heads replete with thoughts of other men,
Wisdom in minds attentive to their own.

Cowper

42631



PREFACE.

Since the publication of my earlier work on "The Bath Aix Massage and Natural Vapour Treatment," nine years ago, new methods have been introduced, and so much of the old treatment has been modified in our Bath balneal system, that we consider the time has arrived when some further development is required at our hands, and as the new Kursaal is now "un fait accompli," and a general extension of the cure will necessarily take place, the writer feels that no apology is necessary for this pamphlet as an addendum to his larger work, which embodied all that was known in connection with the Bath Mineral Water Treatment up to 1888.

H. W. F.

Bath, October, 1897.

MEMORANDUM

TO : [Illegible]

FROM : [Illegible]

SUBJECT : [Illegible]

[Illegible text follows, consisting of several lines of faint, mostly illegible handwriting.]

[Illegible]

[Illegible]

BATH HOT MINERAL SPRINGS.

THE BATH NAUHEIM METHOD AND OTHER NEW SYSTEMS.



THE most valuable aid to cure recently introduced into our Baths is the Nauheim system of bathing for various forms of disease, chiefly of course in chronic diseases of the heart, formerly a malady which was either declined for treatment or treated in so modified a way that positive results were not looked for; even when worked out these were regarded as very unsatisfactory, except in occasional cases of pure rheumatic origin, and those principally in the young. In claiming for this method a greater scope than that recognized at Nauheim, we shall presently see that we have been justified in selecting a wider range of diseases for treatment by the successful results which have been obtained.

Other parts of the new treatment that have been recently adopted are—The Sulphur bathing system at the Hetling Baths for skin affections; the Pine flowing bathing system for nerve diseases; the Aix Massage Vichy system, in connection with the reclining baths and the large tepid swimming bath in the basement of the Hotel Baths; the Natural Vapour Baths, a new set of which has been erected for immediate use in the basement of the Queen's Baths, with more modern douching apparatus in conjunction with reclining

baths ; Aix Massage douching in connection with the flowing Nauheim Thermalbad ; the drinking of very hot mineral water at the Hetling Pump Room at a raised temperature of 150, in order to increase the potentiality of the natural mineral water ; and a speciality of the new system has been the introduction of the gaseous currents within and without the Nauheim system of bathing.

The new Kursaal, with its outer Promenade and the adjacent terraces opening upon the great Roman rectangular Bath, will prove a striking feature in connection with our bathing system, and will supply a much and long felt want.

Bath being essentially a winter resort, all the annexes of the bathing establishment should be warmed, under cover, luxurious and attractive to meet all the demands of the bather during his process of cure. This new building will form a general rendezvous for all water patients. The Promenade will serve as an exercising terrace for the patients, and there will be found opening from the corridor Smoking Rooms, Reading Rooms, and Ladies' Rooms. Music will be a leading attraction, and the noble Concert Hall will be welcomed and appreciated by our water guests. The large room is 71 feet long, 39 feet wide, and 53 feet high to the dome ; this length is exclusive of the gallery for the band which extends over the northern corridor. The hall will seat comfortably 500 people. The terrace overlooking the Roman Bath is 110 feet long and 12½ feet wide, while the Corridor is 108 feet long. The present Grand Pump Room will be absolutely reserved as a Trinkhalle for water drinkers, and its area will be used in inclement weather for exercise after drinking the thermal water, as a very desirable addendum to the treatment ; it will also form an accessory for cooling after bathing at the Queen's. The basement of the Kursaal has been

arranged as a museum for the exhibition of all the fragments of Roman architecture that have been found during the excavations for many years past, and will afford to the antiquarian and archæologist matter of the greatest possible interest. It will be found to be a very fine collection. Arrangements also have been made to throw open the Institution Gardens to all water drinkers.

THE BATH NAUHEIM TREATMENT.

This treatment was introduced two years ago at the Queen's Baths, and during the period of ten working months in each year over 10,500 baths have been given in this bath-house—Ten thousand Sprudelbader, gaseous, flowing; and five hundred non-gaseous, flowing, known as the Thermalbader, all upon the principle of, and as closely allied as possible to, the most potent methods now practised at Nauheim, in Germany. Bath, possessing as it does the only natural hot mineral water in Great Britain, all others being either tepid or cold, has a just claim to the use of these Thermalsoolbader. It is one of the best of the calcium waters, light and limpid, with a tendency to deposit its salts quickly; yet so long as its natural temperature is maintained it possesses all its potentiality by virtue of its thermality.

The Bath Thermal Sprudelbad is charged with one to three per cent. of common salt with well known measurements of free carbonic acid gas. The still stronger Strombad contains larger quantities of salt and a pretty complete saturation of carbonic acid gas. The former (the Sprudelbad) may be partially still or flowing; the latter always flowing, always gaseous, so that in these baths the patient bathes in an ever flowing current of fresh briny, carbonic water. The water at the beginning of the immersion is not

the water at the end of the immersion. A wonderfully pleasant charm is imparted to the surface of the body. The temperature of these baths varies from 90 to 94 Fahr. or from 32 to 35 Centig. In order to ensure a thorough application of this new treatment the Corporation have thought it necessary to establish a standing order that all free gaseous Thermalsoolbader at the Queen's Baths shall be given under the immediate superintendence of the water doctor or his trained nurse, an expert thoroughly well instructed in the Nauheim system. This principle has worked extremely well, as apart from the valuable observations that have been made clinically by the nurses, who are always present, Sphygmographic observations of the circulation of all patients before and after bathing have been obtained. Further, the nurse is there to offer any necessary aid to the bather.

The Nauheim system as used by us at the Queen's Baths has been tabulated as follows :—

- (1). A simple saline Thermalbad, brine not flowing.
- (2). A flowing Thermalbad, brine flowing, not gaseous.
- (3). A mild Sprudelbad, brine partially flowing and gaseous.
- (4). An ordinary Sprudelbad, brine flowing and gaseous.
- (5). The Sprudelstrombad, brine flowing and gaseous.

The ordinary Sprudelbad has delivered into it during fifteen minutes ten gallons of cold Bath mineral water saturated with carbonic acid gas, and the bath is so arranged that a warm current is delivered simultaneously into the bath surrounding this gaseous solution in order to prevent a lowering of its temperature, thus protecting the patient against a cold undercurrent. As before stated, a solution of one to three per cent. of salt is added, and when necessary, in order to strengthen the bath, one or two litres of the Nauheim Mutterlauge, which is the mother lye of Nauheim and contains chloride of calcium to the extent of 20 per cent.

The temperature of the bath, the period of immersion, still or flowing, reclining or sitting, gaseous or non-gaseous, will depend upon the nature of the case and the general strength of the patient, and many nice points have to be observed to meet the varied types of disease for which this class of bath is found so surprisingly beneficial. At the Queen's Baths our chief experience has been derived from the Sprudelbad, flowing and gaseous, more or less, and the results are found in unison with those communicated by Sir Grainger Stewart to the British Medical Association at Carlisle a year ago, the greatest benefit derived from the Nauheim bathing system being obtained from those baths which are abundantly charged with carbonic acid gas, moderately cool, and to this we will add, flowing. In our hands the clear limpid gaseous flowing Sprudelbad at the Queen's has given results far exceeding our anticipations and the clinical observations worked out side by side with those so-called Nauheim baths made with Sandow's tabloids, or with baths saturated with common salt, or with salt still more common, prove irresistibly the greater power of the warm brine gaseous Sprudelbad to cure and relieve in chronic heart affections, rheumatoid arthritis, atonic gout, and rheumatism, beside many other diseases, the special benefit it confers being more complete compensation in heart cases, which in the other baths is only too frequently delayed.

A simple and flowing Thermalbad may be given in those nerve cases where the gaseous current is regarded with apprehension, and as a preliminary condition it is useful when there is no object for rapid compensation during the cure; in weakly females and the young it has been used with comfort before the more serious Sprudelbad has been attempted. At Nauheim this bath is usually prescribed to start with,

but with us our water guests, except under the most severe conditions, are not prepared for a stay of two months, and the English folk expect us to do in one month what our colleagues in Germany only undertake in two. We are therefore compelled to start the Sprudelbad, if it be possible, without a suspicion of delay, and up to the present we have the best of reasons in our results why this should be continued.

IMMEDIATE EFFECTS OF THE SPRUDELBAD.

On entering the Sprudelbad a sense of cold in a bath of 92 to 94 is the first experience. Some abstraction of heat takes place, followed by a natural reaction upon the stimulus of cold and more or less constriction occurs across the chest, accompanied by retraction of the epigastrium. This is but momentary a natural physiological phenomenon of no import. But when the carbonic acid gas flows into the bath the sense of cold immediately passes away and is followed by a pleasant warmth, the skin and lips redden, the body is covered with gas bubbles, the face colours and a delightful sense of lightness and exhilaration ensues as the Sprudelbad pours its wave-like currents upon the body surface. Absolute immunity from inhalation of the carbonic acid gas is obtained by the mechanical means adopted and the flowing nature of the bath, with fresh brine, fresh mineral water, fresh gas, fresh mutterlauge, all contribute to form a bath which gives strength and fresh vigour to the invalid. There are no depressing elements about this bath, as we recognize it to be a tonic one.

THE PULSE.

The immediate effect of the bath is generally a rapidly perceptible slowing of the pulse, with an increase of its volume. It invariably becomes fuller

and slower and in heart conditions, either organic or inorganic, these phenomena occur after two or three minutes' immersion. The systole is increased sometimes at the expense of the diastole and in a running pulse, which is present so often in nervous patients, the slowing down becomes very characteristic under the sphygmograph, showing the lengthening of the diastole. The respiration deepens, the vital capacity of the lungs increases, the blood pressure is raised 20 mm. or more, a sleepy feeling is produced, followed by general invigoration, and diuresis generally occurs. After the bath the patient reclines for 20 minutes and the reclining posture is prolonged for one hour at home.

The advantage of warm mineral water, carbonic acid gas, and salt over simple thermal mineral water is very marked, as in the former a lower temperature can be always given, which is a very important element in heart cases by virtue of the powerful effect produced on the skin by the gaseous saline. An immediate redness of the skin surface, with a welcome feeling of warmth, the result of rapid reaction, ensues; increased metabolism of the tissues also occurs during this process, relieving the over-handicapped heart by improving its nutrition and supplying the coronary arteries with an improved pabulum. And we may note here that the coronary arteries of the heart proper undergo certain forms of degeneration, which explains why compensating processes do not at times actively occur, and bring disappointment in their train. The vagi nerves governing the heart rhythm derive new innervation during this process, which implies an effect similar in action to digitalis and strophanthus. Retarded metabolism usually lies at the bottom of all our troubles, and in our experience no water treatment so hastens metabolism in these diseases as does the Nauheim system.

M. Dufresse de Chassaigne deals with this subject in a book issued in 1859, its title being "Influences of the Mineral Baths of Bagnols upon chronic heart affections." Our own Dr. Falconer, in Bath, in 1866, worked out rheumatic heart affections treated by the plain Bath mineral water at a temperature of 91 to 92, and in the course of 500 cases, with accurate observations made with the assistance of the writer with Marey's sphygmograph, substantial progress was made towards the clinical results as are now obtained by the Thermalbad at the Queen's Baths. Circumstances unfortunately never allowed these observations to be recorded, and they have been lost to the profession.

Professor Beneke first wrote at Nauheim on the effect of carbonic acid gas and salt upon the rapid absorption of lymph on the joints of gouty and rheumatic patients, and Dr. Groedel records and confirms Beneke's observations in the treatment of chronic heart disease. He insists (1) That these briny, gaseous waters remove, by virtue of their tonic action, the too frequent relapses so well known in cases of rheumatic fever. (2) As the baths produced absorption of lymph and inflammatory products into the joints of rheumatic patients, these were taken up, metamorphosed and eliminated. (3) The Nauheim baths exercised specifically a soothing effect upon the heart's action and upon patients who were sufferers from the rheumatic diathesis. (4) In old valvular disease with feeble heart, a local cardiac compensation sets in and usually a marked improvement of the general health ensues; and although this result may come about spontaneously in rare cases, yet it may usually be relied upon during a course of the Nauheim waters. Upon this teaching the Brothers Schott and Dr. Groedel have founded the modern treatment at Nauheim, which is now so generally recognized in this country.

ALTERATIONS IN SIZE AND SHAPE
OF THE HEART.

The heart is not only a pump but a suction apparatus influenced by nerves possessing accelerator and depressor functions derived from the vagus and sympathetic systems. The ventricular pump may be going normally, but the work of the auricular suction power may be deficient and hesitating in its action, slow and weak, or both ventricles and auricles may be at fault. These conditions are regarded as being well suited to Schott's methods, especially if valvular lesions are not present. The organ is stated to contract, chiefly in its transverse diameter, under the bath and the manual resistive movements; and careful experts, such as Dr. Heineman, of New York, show, that in one-fourth of the cases the first bath or two, especially if gaseous and saline, produce a defined diminution in the size and shape of the organ. But this effect cannot be ensured with certainty except after a series of baths when careful measurements have been made before and after the bath. Heineman observed the pulse pressure by von Basch's sphygmometer, the calibre of the arteries by the arteriometer, the pulse tracings by Dudgeon's sphygmograph, and the capillary pulse by Max Herz's instrument. The position of the body was always the same under these varied observations, and the physical relations of the neighbouring viscera were duly mapped out. After all these most careful and scientific investigations, and eliminating all possible sources of error, we are bound to confirm the cardiac shrinking.

Our own observations of over 5,000 heart cases lead us to believe that the apex of the heart after six or eight Sprudelbader tends to fall towards the mesial line of the sternum, and that if the apex beat before treatment is found outside the nipple, it falls slowly

within the line. Percussion has been used as a means of diagnosis albeit it may be an uncertain quantity. How long before the normal size and conditions of the organ return, how long before the natural functions re-adapt themselves, we have as yet no exact data to determine. How far certain contractions are permanent or temporary remains problematical in the weak forms of imperfect compensation; but in favourable cases clinical results are so markedly good that Schott's teachings are bound to be recognized; and although German writers still doubt his conclusions. in England they have so far taken root that they seem likely to stay, yet more light may be required ere his doctrines can be fully accepted. It may be fairly assumed that after a course of baths or exercises, or both, if full compensation has been effected in the cardiac muscle, some diminution in the size of the organ most decidedly occurs unless there be a lung or renal condition present of a more or less chronic order.

Dr. Schott's most recent observations by means of Röntgen's rays have yielded striking results, for up to quite recent times the physiological processes known to us have not given much exact knowledge of the changes in the physical forms and capacities of our internal organs. What, for example, have we known of the changes in the centres of the circulation under pressure of the rowing, running, and "scorching" man? What are the conditions immediately produced in excessive strain of the heart, aorta, and the lungs? Dr. Schott recently showed us at Nauheim a photographic picture, as seen by Röntgen's rays, of the effect of a 40 minutes' cycle run on the heart of the fleetest man in Frankfort. The picture was too extraordinary to be conceived. The increased size of the heart, its alteration of shape, out of all proportion, together with the bulging and increase of the size in the great vessels at the base, gave an object

lesson which should be known to the cycling world. What occurs in this condition occurs more or less in all excessively continued athletic exercises. To Dr. Schott the profession and suffering public owe much for his unsophisticated methods of imparting his knowledge to the general seekers after health. Through his generous impulses towards his colleagues he has rather given himself away by having attempted to teach too much. Consequently his methods have been introduced into England far too extensively. They have been inefficiently carried out in many instances, producing results of a disappointing character. Any sort of bath made with tap water, salt, lime salts, tabloids, and effervescing baths made by rule of thumb have been called the Nauheim system and have done much to damage the real system taught by Schott—this by men who have treated their cases by books and have never personally studied the practice at Nauheim.

Certain clinical notes have occurred to us in the treatment of these numerous cases at the Baths of Bath which it will not be out of place to record here.

The ptomaines found in the alimentary canal account a good deal for the discomfort of heart mischief and seem to increase the apparent gravamen of the case. The writer has found dry calomel on the tongue the most efficient drug for meeting this condition during the bathing process, the supposition being that calomel in this way acts antiseptically upon the lining membrane of the stomach in the same way as the ordinary perchloride does upon a surgical wound.

In cardiac cases should too marked a perspiration be present, no sort of packing is attempted after the bath. The patient reclines, lightly covered, for twenty minutes, or is sent straightaway from the bath-room. The bathing authorities have a wrapping formula to meet heart conditions.

We are often called upon to make the best of a damaged organ. We have to try to make the organ practically useful. Let us cheer the patient on his way, surround him with the healthiest conditions as far as circumstances permit ; lessen his work ; procuring, if possible, change of air and scene, a sunnier climate, modifying his exercise, making it regular, prolonging his rest in bed and letting him generally walk on the flat, and, as he improves, on slightly rising ground. In the way of diet Oertel's dry food method has virtues of its own.

Paroxysms of dyspnœa, especially if associated with emphysema, if occurring suddenly at night after the first sleep, are usually associated with weakness of the cardiac muscle. During the contraction of the muscle the blood vessels dilate and an increased arterial flow of blood takes place, followed by a more rapid venous flow to the right side of the heart. We believe also that carbonic acid in the blood probably acts upon the vaso-motor and respiratory centres immediately, great dilatation of the cutaneous vessels ensuing, with more or less perspiration and deepened respiration.

In ordering the Sprudelbad we must always bear in mind the desirability of lowering the temperature of the bath and ensuring a full supply of carbonic acid gas. The Bath mineral water is loaded with calcium salts, but in order to make it approximate in the closest way to the Nauheim water we add, as before stated, the Mutterlauge.

Dr. Sydney Ringer has proved the strong stimulating effect of calcium salts upon the heart. The difference between tap water in its effect on the system compared with saline baths, especially if they be flowing and gaseous, is very marked. For example, the metabolism is greatest in the Strombad where the body is surrounded with fresh warm saline brine

fresh carbonic acid gas and the mother lye, with the wave movement of the douches, having a most exciting effect on the surface of the skin which no tap or sea water will produce.

DISEASES MOST SUITABLE FOR TREATMENT AT BATH ON THE NAUHEIM SYSTEM.

- (1). Chronic heart disease in its various forms—exceptions few.
- (2). Acute rheumatism in its sub-acute and atonic forms.
- (3). Rheumatoid arthritis (so-called), simple or mixed cases, and those aggravated by gout and rheumatism, or grafted upon them.
- (4). Chronic rheumatic arthritis.
- (5). Sub-acute and chronic muscular rheumatism.
- (6). Locomotor ataxy and cases of localized or multiple neuritis; sub-acute neuralgia and lateral sclerosis of the cord.
- (7). Chorea of children, especially of rheumatic origin.
- (8). Anæmia, neurasthenia, chlorosis arising from absorption and exhaustion in young females.
- (9). Rickets in children, especially those with glandular enlargements; also exophthalmic goitre in the adolescent.
- (10). Uterine and pelvic cellulitis, the early stages of appendicitis and mucous catarrh of the intestines, also in certain forms of chronic metritis and the numerous cases of erosion of the cervi uteri which leads up to the chronic pyæmia of rheumatoid arthritis with its terrible stiffening forms of joint deformity and crippledom.

The very best results are obtained in those cases in which hurry, scurry, and worry have played so important a part in the causation of heart affection;

while the large group of cases with a weakened and over-strained heart derive the greatest benefit when dissociated from degenerative valvular disease or myocarditis. The irritable heart, too, derives much good when the irritability proceeds from infective sources. Ordinary cases of œdema and anasarca are not contra-indicated. Relapses of course occur at Bath as well as at Nauheim. Exacerbations of articular gout and rheumatism frequently happen, but mild processes of treatment are then adopted, or a temporary cessation of baths is ordered if thought desirable.

Certain forms of disease are absolutely negatived. These are chiefly aneurism and aneurismal dilatation, sometimes in angina pectoris, usually in extensive arterial sclerosis, Bright's disease, renal congestions, diseases of lung or stomach. cerebral hæmorrhage, and impending conditions of apoplexy. This list has been greatly modified during more recent times. Cases of angina pectoris are very frequently relieved, especially those of neurotic origin. Early cases of sclerosis are now treated largely with much benefit. Few are declined, and in the dilated heart with emphysema great relief has followed the use of the Sprudelbad, with or without Schott's Resistive Movements. The long standing cases of aortic valvular disease, with disease of the coronary vessels, and those cases of myocarditis with faulty innervation, accompanied by all the signs of degenerative heart disease, are now recognized as justifiable ones for treatment by virtue of the wonderful relief that has been obtained by this class of patient quite recently. In cases of delayed compensation or compensation already begun and not completed, compensation has been deepened and carried on to completion. But in the debility of age, the weakness of early life and the overgrowth of childhood especial care is needed ; baths must be given for shorter periods, and the volumetric quantity of water used for

immersion diminished. At the same time the use of the mineral water for drinking purposes requires much judgment in the heart forms of advanced age, especially in the cases of patients suffering from asthenia and old dyspeptic cases with dilated stomach.

And while we are on this subject, let us say that gymnastics should be avoided in advanced aortic incompetency, in marked cases of fatty degeneration of the heart muscle, and in atheroma of the blood vessels. Massage as given in Bath, however, can well be substituted, as it removes venous stagnation of the surface of the body, increases peripheral circulation and stimulates generally the muscular system to renewed action; and with better nutrition of the cardiac muscle we should naturally look for a compensating hypertrophy of the organ. There is a large division of cardiac valvular disease with absolute loss of compensation. These are the cases which the best men of our profession have failed to relieve, and the patient has often been ordered to bed for absolute rest, and to await the time of his dissolution.. Here this treatment steps in and those who have followed out these desperate cases know full well how much good has been derived when all medical measures have failed. We see numbers of these patients return to their business and come back here for a repetition of their treatment, for the most part restored, and, as they say, "working sound."

Oertel's method of "Terrain Cur" (walking up hills and climbing mountains) can only be justifiably ordered for people who suffer from obesity, with languid health, and general debility of the muscular system, but without marked valvular mischief and without much deficiency of compensation. To order this treatment in aortic incompetency and cases of dilated aorta would be positively courting disaster, and our own Stokes knew better than to adopt this method as a crucial system.

Many water doctors have dwelt upon the modification and total disappearance of cardiac murmurs, especially in the young and adolescent, during the use of the warm mineral water system. Dr. Leon Blanc, of Aix-les-Bains, has written much on this subject, and confirms the view we have taken. But while the massage treatment would appear successful in a considerable per centage of these cases, in many others, with delayed compensation, indifferent results have been produced with the Aix massage method. But during the last two years these tardy cases of compensation have been dealt with most successfully by the Bath Sprudelbad and Sprudelstrombad, and we have found that after one or two courses of these Nauheim baths the feelings have disappeared simultaneously with the disappearance of the murmurs. Hæmal bruits disappeared in anæmic females, and simultaneously the colour returned to the cheeks. However loud these murmurs may be, and perhaps suspiciously organic, they disappear absolutely when complete compensation has been established. These anæmic blood murmurs are very interesting, and sometimes mystify our treatment. Dr. Stephen Mackenzie has pointed out that a good idea of the degree of anæmia can be obtained by observing the nail beds. So long as any pink colour can be seen, it may be assumed that there is a proportion of 50 per cent. of red discs. Dr. Sansom says that when the pink colour entirely disappears from the nail bed, the corpuscles will be found as low as 50 per cent. Certain features occur in organic heart disease, as we find in profound anæmia ; it is therefore most important to avoid a grave error of treating an organic murmur when it arises from a poor condition of the blood only. With adequate hypertrophy of the organ, maintaining sufficient compensation, all drugs ought to be left alone ; but an impoverished blood state often produces

anæmia and œdema of the extremities, showing ventricular deficiency. These same conditions occur in organic trouble, and it is more than necessary that differential diagnoses should be made. Digitalis, for example, may produce positive harm in functional weakness, and as the digestion often becomes a factor in anæmia, when organic heart disease is present we often get anæmia associated with organic troubles, especially in the rheumatic diathesis, and if aortic incompetency be present, the organic state is still more pronounced. If the quantity and quality of blood be interfered with deficient compensation ensues, the heart underworks and underfeeds itself, the downward progress is rapid, and then the Nauheim treatment steps in to work its cure.

Hæmal murmurs, however, are always systolic, and if a diastolic condition be present it will be certainly found organic in due course. The blood murmur is usually soft, less grating than organic murmurs, and if heard at the pulmonary orifices, it may be understood as being anæmic, but the position of the body on examination will often decide its character. Organic bruits are found in the greatest number of cases in the aortic area. Hæmal bruits do not occur frequently in the mitral region, and it has been pointed out by Dr. Andrew Smith that when murmurs arise, they resemble in everything except harshness the sounds accompanying organic mitral insufficiency. Yet at the autopsy the valves have been found quite normal. In those cases there is no displaced apex beat, nor are the forcible impulses present which usually mark organic mitral insufficiency, so that after all it may be anæmic. Anæmic murmurs are seldom found in the tricuspid region. The accentuation of the aortic valve sound may be due to anæmia or renal degeneration, and the latter may be fixed when œdema is or is not present. Of course

the crucial test of anæmia might be worked out by measuring the number of cells in each cubic mm. and the relative per centage of hæmoglobin. However, the treatment of anæmia associated with cardiac disease is fortunately not so essential as to be remembered with the other condition occurring alone. Where œdema or dyspnœa is very marked from either cause, functional or organic, the Nauheim treatment meets either causation. Dr. Andrew Smith insists that in the earliest stages of heart disease the evidences of anæmia should be sought for and the best means adopted without delay for cure.

Schott says that the Nauheim waters act in their own peculiar manner. Increased tissue change is seemingly accelerated by an increased oxygen absorbing power of the cells, and this is evidenced by the feeling of need of rest, followed by sleep after the usual bath. Increased loss of weight, should it occur during bath treatment, requires close watching, as too severe a regimen brings about sleeplessness and muscular loss. But in the happiest cases the bath makes the heart beat more strongly, the pulse slackens, blood pressure rises, the respiration deepens, and the vital capacity of the lung is strengthened, the skin responds, the urine is increased, the exudata of joints, peritoneum, pericardium, pleura and pelvis, are absorbed rapidly. And we are pretty well in a position to affirm that much the same results succeed the Nauheim treatment in Bath. It is often stated, with some truth, that the weakest thermal bath occasionally exercises in highly excitable people a soothing influence which the stronger tonic action of the Sprudelbad occasionally fails to produce, but the mildest Sprudelbad, No. 3 for example, here rarely fails to soothe. Get over the unnecessary nervous excitement, consequent upon the flowing gaseous current, then all will be well—confidence takes the place of timidity, and the running pulse soon falls to its normal condition.

Sometimes, as previously pointed out, a gouty or rheumatic invalid suffers exacerbation of his joint troubles, the result of exudata taken up into the circulation by the stimulating effect of the mineral brine, but with a little patience this condition passes away in a short time. Yet it is extremely necessary not to order any of these baths at haphazard. Temperature and period of immersion require careful adaptation to these patients, and as it is recognized that these gaseous saline baths produce increased metamorphosis of body tissues, compared with baths made of tap water and brine compounds, a clear judgment is required in prescribing, and one must be careful not to make the bath too strong or to give it at too high a temperature.

ABSORPTION.

The question of absorption by the skin during bathing is a complex one. The clinical results of immersion in the case of the chlorotic, anæmic girl, prompt one to declare that absorption must occur, but chemical laws declare against us. Beneke and Rohrig have attempted to prove that in brine baths no increase of salt is excreted by the kidneys; and what is true of common salt is equally true of salts of iron or the salts of lime. The general consensus of opinion, however, is towards the theory of non-absorption. Nevertheless it is accepted as true that the skin is capable of absorbing substances that are volatile in the form of gas or vapour. Rohrig proved that by applying finely pulverized water to the skin by force of rubbing some absorption took place into the corium; and this of course has to be borne in mind with the Aix massage. But other authorities consider that the quantities are only minimal.

Gerlech concludes that certain quantities of carbonic acid gas only are absorbed during the bath;

according to all recognized law it can only occur in proportion as the pressure of the carbonic acid gas of the mineral bath exceeds the tension of the gas in the circulating blood and in the lymph. Sulphuretted hydrogen gas however is freely absorbed by the skin.

Leichtenstern states that in taking a bath an imbibition of water, and of the salts dissolved in it, is taken up only by the superficial layer of the epidermis and among the most favourable conditions are warmth, long immersion. removal of the oiliness of the skin by repeated baths or by scraping. The palm of the hand and the sole of the foot having no sebaceous follicles imbibe water most easily. Imbibition has not absorption as a necessary consequence, as it is probable the water imbibed by the most superficial layer of the epidermis evaporates immediately after a bath. We are therefore thrown back on the reflex theory of the great physiological good obtained by the heart and blood vessels from the enormous capillary network of the skin. The supposed relief of the internal organs while blood is circulating in the previously engorged capillary blood vessels, followed by an increase of blood in greater quantities to the heart, compels us to adopt the view that the capillary circulation is a natural factor in one of the processes. But the presence of millions of gas bubbles on the surface of the skin makes us wish that the gas and vapour theory of absorption could be accepted. It is a fine object lesson at Nauheim to immerse the naked arm for three or four minutes in the strombad, as the bubbling water rushes into the bath. The skin reddens immediately, a strong sense of warmth is developed beyond the actual temperature of the bath, and the surface is covered with millions of gas bubbles which, when brushed away, leave the skin surface quite pale.

THE EXERCISES—THESE ARE PASSIVE AND RESISTIVE.

Passive movements like the methods adopted by the Zander Institutions abroad and certain Swedish Gymnastics practised here and there in this country. Scientific massage, however, done manually is the passive movement we are chiefly interested in, and with Schott's Resistive Exercises, introduced into this country by Dr. Bezly Thorne constitute the mechanical means adopted and carried out in Bath in connection with our new system.

Massage, not dry rubbing, as a passive exercise, has proved of great value in Bath in certain heart cases. It removes venous stagnation of the muscles, stimulates the heart, increases the circulation of the skin and periphery. It can be ordered alone, with Schott's resistive movements, or with the bath. It is often adopted when Schott's exercises cannot be borne or do not seem to agree with the patient; but in feeble cases care must be taken lest heart fatigue ensue during the varied processes of masseèing. In Schott's exercises the sphygmograph will often explain why the resistive movements have to be suspended. Occasionally the same thing occurs in the kneading of the muscles in general massage. In the absence of all physical signs these conditions may arise from idiosyncrasies. Schott's movements to the upper limbs, with massage of the lower limbs—the patient reclining and raising the lower limbs for some seconds during the masseèing process, are very useful; the blood from the lower extremities rapidly emptying itself into the abdominal venous current produces, for a considerable period, diminished size of the lower limbs. Dr. Lander Brunton's "Experimental Results of Massage" show that massage of the muscles increases the flow of blood through them. As soon as it ceases there is an accumulation of blood into the masseèd muscles,

followed by an increased flow, and by giving general massage of the muscles, a slight increase of blood pressure ensues, followed by a fall. Massage induces in a limb in starting a diminution of size, and Dr. Oliver has shown that its immediate effect is to raise the blood pressure and enlarge the calibre of the artery, but after a time the calibre of the artery diminishes and the pressure falls. The rapid passage of blood through the muscle gives it in this matter the action of a supplementary heart.

Passive exercises bring into the muscle a large volume of blood which improves the lymphatic circulation. Sir Grainger Stewart mentions that Ludwig has estimated that as much blood flows through the muscles as through the skin and internal organs together, so we may conclude that the exercises relieve an over-loaded heart by gathering into the muscles a large quantity of blood, making the work of its muscular fibre easier in a direct mechanical way. Considering, however, the delicate nervous relationship existing between different parts of the circulation, it may well be supposed that through this channel also the circulation is benefited by the mechanical change, and a beneficial condition of the heart and pulse is brought about.

Schott's resistive exercises consist of slowly conducted flexion, extension, adduction, abduction and rotation in regular succession. These movements are not athletic. The late Dr. Auguste Schott recognizing the effects of certain movements upon the circulatory apparatus formulated a series of movements, known as Schott's Resistive Exercises, which have been published to the world by his living brother, Dr. Theodore Schott, who has utilized and developed them on the scale on which they are now used. They are known in Germany as the *Widerstands-Gymnastik*. There is a great deal more

in Schott's movements than appears at once to the eye of the observer. The general results are similar to the results of the bath, but we hold that usually they are the necessary corollary of the bathing system. The movements are made slowly, without effort or spasmodic action of the limbs, the action being smooth and even; a momentary pause after each movement, and after each successive series of limb movements a pause for two or three minutes, is necessary. The operator directs the patient to make certain movements in certain directions, due resistance being made with the hands and counter resistance offered by the patient. The breathing in these conditions should always be free. The degree of strength determines the duration of these movements. Whether the upper limbs only are used and the lower limbs omitted, whether the arms are raised above the level of the shoulders, whether the patient is recumbent or standing, whether the breathing is increased, whether the pulse is naturally altered, and the heart's action accelerated, whether there be pallor or duskiness of the face, and cold perspiration; all these are features that require to be watched carefully. The time may be 10, 15, 20, or 30 minutes, including the pauses. These rules will apply to chronic heart cases and their frequency of application will often depend upon whether the baths are used or not. The baths are given without the movements, and the movements without the baths. At Bath we generally give the bath, followed the next day by the movements, or in exceptional cases the movements daily with baths three times a week. Occasionally, in extreme cases, baths and exercises have to be given in the same day. Often in apparently the most incurable cases movements are the only method of treatment adopted, the patient having to rest absolutely in bed.

These resistive exercises are most generally used

in conjunction with massage in the treatment of stout persons. They may be given firmly and carried out consistently. Increased metabolism of the tissues with the very best possible results occurs in gouty and rheumatic people of middle and advanced age, if these processes are combined in practice ; and it is not always necessary to hurry on with the greater movements when benefit is derived from the smaller and simpler ones. But we desire to add our testimony to the value of resistive exercises in some cases where baths are not only inadmissible, but cannot be borne after repeated trials. This is chiefly in mixed heart cases where in advancing years with a defined mitral insufficiency there is cardiac hypertrophy, and perhaps an aortic dilatation resembling an aneurism. Rest and repose are strictly enjoined, but with the resistive system we get remarkable results in the relief afforded to the sufferer by adopting these movements, not quite perhaps empirically, but without digitalis, baths, or drugs to help the progress. This treatment seems to do for the heart in a lesser degree what the Sprudelbad does more speedily. The patients we have in our mind were cases in which the baths could not possibly be ordered, or had been ordered and countermanded because they could not be borne.

All gymnastics should be avoided in extensively developed arterial sclerosis, advanced atheromatous degeneration of the aorta ; aortic incompetency and in marked cases where fatty degeneration of the cardiac muscle is suspected. Ordinary œdema of the extremities and anasarca arising from cardiac feebleness are not contra-indicated, but the cases of gouty, granular kidney of Bright, aneurism of the aorta of the second and third degree, and other serious complications arising in lung and brain, as embolism, neither the movements nor the baths are to be thought of.

The best results come out from cases of smoker's heart or in cases of weakened outer muscular capsule of the organ. Wherever there is deficient compensation arising from valvular lesions, defective nerve power, loss of tone through shock, infectious disease, or influenza, with all their weakening effects on the cardiac nerve centres, as well as in the neurotic forms of angina pectoris, the results work out so satisfactorily that we hope by these Schott's movements alone in many a case to establish a state of health to enable the patient to follow his vocation in comfort.

We have said there are numerous cases in which all the best medical men in the kingdom have tried their skilful hands with drugs and have failed to relieve, when by establishing free, full compensation by baths, or movements, or movements alone, apparent recoveries have taken place, and the patients have enjoyed, with care and subsequent judicious management of themselves, an immunity from their troubles for a more or less lengthened period. On the other hand, it is only fair to say that with rigid arteries, rigid valves, and myocarditis, with degenerated coronary arteries, free compensation is not to be expected and cannot be hoped for. Some of these cases undoubtedly improve under treatment, and local relief ensues with judicious bathing and movements. Further, we have often seen the dicrotic pulse of renal albuminuria materially altered by a course of exercises and gaseous baths, and although observations in this type of diseases may be difficult to define, we believe that we often see diminished dicrotism present without any physical sign.

THE SPHYGMOGRAPH (DUDGEON).

This instrument has been used for over a year and a half in connection with all the gaseous baths and Schott's movements, and allowing for occa-

sional eccentricities of the instrument and lack of ready manipulation of the operator, we are able to record results extending over 5,000 baths and 2,000 cases of Schott's movements. These observations have been taken immediately before the baths and movements and immediately afterwards, the body always in the same position and the pressure of the instrument always the same. We believe that we have been able to diagnose the earlier stages of valvular deposit, diminished size of arteries, feeble cardiac action, irregular rhythm arising from mental and physical causes. We think also that dicrotism as another feature may be functional or organic, its exact situation on the tracing requiring to be accurately noted. A slowing of the pulse indicates the lengthening of the systole with a frequent lengthening of the diastole. The small round bulbous appearance of the apex is a frequent occurrence in tracings when no physical sign can be detected by the stethoscope. It occurs in the anæmia of the young and middle aged, especially smokers, and in cases of obesity with a suspicion of a weak cardiac muscle and in the first evidence of changes in the elastic arterial tissues of the aorta. The Sprudelbad alters many of these tracings. It alters somewhat the frequency of aortic intermittency if the patient be not too old in years or too advanced in arterial degeneration. And what the bath does speedily the movements do more slowly. When dyspnœa and dilatation are present the Schott's movements are seen through the tracings to fill and slow the pulse, which moves more regularly and less intermittently. Dicrotism again is an evidence of want of strength in the young and of commencing arterial changes in the vessels in those of middle and advanced age. The Sphygmograph will often show peculiar effects in a man of forty-five, muscular, a giant in strength with an irritable jerky

pulse dropping after immersion in a bath of two or three minutes 15 or 20 beats in the minute. The after bath tracing clears up the diagnosis of an irritable muscle without valvular lesion. A man of sixty with an aortic regurgitant bruit, showing a leaky valve, has no appreciable alteration of pulse except the normal slowing down. Under the movements the aortic regurgitancy produces a marked intermittency. This patient had suffered from an attack of apoplexy two years before, the result most probably of an embolic plug, from which he had quite recovered. Changes still going on in his aorta will probably compel us in future treatment to interdict the use of the movements altogether, but during this recent visit the Bath Sprudelbad, with a course of twelve baths in three weeks, seemed to agree uncommonly well with him. The dicrotic pulse is frequently seen also in stout females when bathing at the menopause, and many sphygmographic vagaries are apt to occur at this time of life. The anæmic girl will often give a faint wave line both before and after the bath, but a rise occurs when colour is seen returning to her cheeks.

The Sphygmograph shows also that a permanent compensation by Schott's movements alone can be established without bathing as during the movements blood flows into the skin capillaries, the space for the circulation is increased, fresh ground, as it were, is opened up and a flowing over of the banks by the flood ensues in those cases where baths cannot be borne. The note books of our trained nurses at the Baths show by means of the sphygmograph that marked compensation with general improvement from bathing is of common observation in the young, in the middle aged, and occasionally in those of advanced years. The pulse of 120 in the neurasthenic patient falls in fifteen minutes to 80 during immersion in the Sprudelbad. The soothing action of the bath is very

characteristic with this type of person. If compensation be delayed we get no general improvement of the wave lines until compensation sets in, when the wave lines slow down and equality establishes itself; nevertheless we are always looking out in these cases for relapses. They do occur and suggest that the patient should return to Bath at the end of six months for another course with the hope of establishing a permanent compensation.

Certain eccentricities of the tracings occur in myocarditis, arterial sclerosis, and in patchy conditions of the valves and arteries, and where compensation is delayed we suspect those lesions, even when the stethoscope fails to afford us any definite information.

OBSERVATIONS ON THE NEW MODES OF TREATMENT.

Leaving much that requires further light to explain the physiological processes involved in the Nauheim system we pass on to see practically what has been done in Bath during two years in carrying out this treatment not only in chronic heart diseases but in a further range of complaints which have not been attempted even at Nauheim.

Of the 10,500 baths given, 65 per cent. have been heart cases, chronic or subacute, organic or functional, simple or complicated, hearts arising from rheumatism and gout, the smoker's heart, hearts overstrained by exertion or weakened by constitutional diseases, valvular lesions occurring in rheumatoid patients—the probable result of a chronic septic infection—which we claim to have worked out in Bath as the real causation of this terrible malady. Cases of valvular disease, cases with defective innervation, cases of myocarditis with weakened cardiac muscle, cases of neurotic origin, such as those arising in angina pectoris, and others too numerous to specify.

The Rheumatoid arthritis cases, when taken early without severe heart complications, have derived the greatest benefit, the bed rock of treatment being to find out at starting the real situation of the septic absorption, a matter not so easy, especially in advanced cases beyond the menopause. Rheumatoid arthritis is essentially a female disease, and in its early stage, when only one or two joints are affected, or one limb possibly, there is great hope that the malady will be arrested if the uterus, teeth, throat, post nasal orifices and suppurating glands can be diagnosed and radically treated. There is no doubt that rheumatoid arthritis is a specific chronic pyæmia due to the absorption of a micro-organism, either a bacillus or a coccus. or both. It has no connection in any way with gout or rheumatism. These micro-organisms have been found within the joints of the living body in this type of disease.

In ankylosis of the joints hot water cannot cure ; it will relieve local pain, and possibly benefit the general health if too many baths are avoided, but nothing more. But for enlarged and contracted knee joints, the common feature of rheumatoid arthritis, a simple mechanical apparatus has been used here for several years and with marked benefit to those who have persevered in walking, and who are content to walk and endure for a time. This is a modification of Thomas's splints. The knee joints are first straightened, under an anæsthetic, and with a knee joint made as straight as possible, with no power to bend the joint, the patient is asked to walk, a pair of sticks being substituted for crutches. The knees under this treatment diminish in size, and the dry arthritic surfaces become eburnated as the patient walks about. Massage also is freely used in these cases. It is fatal in these cases to rest. In the end the splints are abandoned and the patient walks alone without permanent stiffening of the

knees. The surgical value of this splint lies in its freedom of use, especially during the douche and bathing treatment. In most knee cases the splints are required to be worn for many months, and during this time patients are found who decline to move unless the splints are used. They have been found most useful here in all the advanced forms of rheumatoid and obstinate contraction of the knee joints.

The Sprudelbad, with its invigorating properties, does much for these joint lesions. No bath here, in my experience, has seemed to do so much temporary, and, in many cases, permanent good, as during the past two years, not only have we had to do with an increased number of all the rheumatoid cases, but with hundreds of chronic heart cases, mixed and unmixed, which were formerly prohibited the use of the bath and relegated sternly to water drinking, or to a few careful massage douches.

It has been suggested in various quarters that the new systems introduced of late have superseded the old methods such as the deep reclining baths and local douching. This, however, is not the case, as many of the Nauheim bathers take Aix massage, vapour, and flowing baths, in conjunction with the Sprudelbader.

The people who profess to be alarmed at the adoption of the Nauheim system in Bath, to the apparent neglect of the older system, seem to forget that there is room for all. The German systems have not prevented the free use of deep baths, massage douches and vapour baths, which go on in undiminished numbers. But the marked increase of bathers during the past two seasons has been due for the most part to the introduction of the Nauheim system, and the Bath Corporation should not be slow to recognize from whence the change proceedeth. Corporations

are in themselves excellent. They stand relatively *in loco parentis*, but they are apt to consider too long, to procrastinate, and this procrastination may be harmful, if not injurious, to the cause they wish to serve. All balneal systems must be essentially progressive. Within our recollection the old bathing system gave us a return of about 5,000 bathers per annum only. Now 90,000 to 100,000 baths are given in the same period, and with this increase has come an increased percentage of cures, and more prolonged intervals from suffering,

The Nauheim system in Bath has also served for a considerable number of those atonic cases of gout and rheumatism in which, owing to the too highly stimulating properties of the hot water, its effect on the blood, highly charged with uric acid, with kidneys not eliminating their effete material, has caused acute and sub-acute recurrences of troubles in the joints, the joints themselves in many of these gouty cases being loaded with unabsorbed *materies morbi*. The hot bath is pretty certain to rekindle all the old inflammation in these joints. The lowering of the bath to 91 and 92 Fahr. in a mild Sprudelbad, or a still cooler soothing bath like the flowing Thermalbad, has brought about more successful results in these cases by avoiding recurrences and expediting convalescence. In nerve diseases, a more prolonged treatment being necessary, less apparent success has attended the Nauheim system. In locomotor ataxy, lateral spinal sclerosis, localized and multiple neuritis, and the pseudo-tabetic cases, much good, however, has resulted from following the low temperatures recommended by Professor Charcot.

By avoiding too hot a local and general current the Sprudelbad at a cool temperature has proved very successful in the treatment of Sciatica. The deep bath, with the exceedingly strong undercurrent,

we rarely use. Prolonged immersion for 25 to 30 minutes, at a temperature of 92, with gentle wave currents carried along the course of the nerve, seems to us to be the best mode of treatment in ordinary cases.

Modifications of the baths have often to be adopted. Half-baths have to be given to the young of seven years of age and upwards ; half-baths to the aged ; half-baths to the emphysematous, with cardiac dilatation ; half-baths to the highly nervous patient, and to the nervous chlorotic female ; half-baths to all the grave heart cases, at the commencement of the bathing system. And these half-baths are so arranged that the patient sits in the first instance on a low stool in order to keep his body well out of the bottom of the bath.

The objection to deep baths for the treatment of profound heart cases, existing as they so commonly do in advanced years, associated with chronic gout and rheumatism, cannot be too strongly insisted upon. The volumetric weight alone of 800 gallons of hot mineral water on every square inch of surface, in a dilated heart case for example, involves the greatest danger to the patient, and, in my opinion, no cases with evidences of degenerative disease of heart, muscle, valve, nerve, should be put, at any time, into a deep bath in any of our establishments. Disaster must follow such treatment sooner or later, and, although the deep baths possess an intrinsic value of their own for various chronic forms of joint diseases, yet the line requires to be sharply drawn and acted upon. Many patients using our deep baths on their own account find themselves very much in trouble, and a timely warning will not be out of place here—to take advice before beginning a mineral water course.

THE VICHY MASSAGE DOUCHE.

In the basement of the Hotel Baths will be found a bath-room furnished with all kinds of apparatus necessary to the administration of any desirable douche. Horizontal massage is usually given there. Cadet's sitz bath is also available for inflammatory conditions of the prostate in the male and the special treatment of uterine and pelvic diseases in the female. The needle, lumbar, and Scottish douches for lumbago are administered here followed by a flowing Thermalbad, or, if the patient prefer it, by an immediate plunge into the large tepid swimming bath, a method of bathing most agreeable in summer, and a very favourite bath for men who are ordered free use of their limbs while bathing. Nine different modes of douche can be given in this bath.

The LADIES' AIX MASSAGE, with a reclining flowing bath, will be found in the corridor, on the first floor. When the strength of the patient is good, and the cardiac conditions are satisfactory, especially in the rheumatic diathesis, the simple Aix massage bath can be judiciously used in mild heart disease in conjunction with the Sprudelbad or Pine Sprudelbad at the Queen's.

THE PINE FLOWING BATH.

The Pine Flowing Bath, with its continuous wave currents, may be taken at the Hotel or the Queen's Baths. This bath is very suitable for the brain fagged, exhausted patient, and for the neurotic anæmic female who suffers from a neurasthenic condition with sleeplessness. The effect of this bath is to soothe the nervous system, and in none has it proved more useful in our hands than in the prolonged convalescence of typhoid, malarial, and rheumatic fever cases. In these reclining baths, where the temperature can be arranged to a nicety, a prolonged immersion

for the treatment of a now recognized common disease known as *Appendicitis*, has become fashionably useful here. During a recent visit to Plombières the writer found many people who were suffering from this disease using the hot waters. The waters of Plombières, so similar to those of Bath, had been known, even before their development by the Empire, to have a singularly useful effect in intestinal irritations, and in the treatment of a troublesome intractable form of mucous disease, and a distinguished English physician informed me on the spot that he quite recognized their value. In these cases the temperature should not exceed 94 to 96, and immersion should be carried out gradually and continued for 30 minutes. Soaking in a hot mineral natural water can only be obtained in Bath among all the Spas of Great Britain. A simple measure such as this, if taken in time, may probably save a grave operation in the case of many a young person. Something of this kind was known in Bath in Guidott's time (1676).

THE SULPHUR, BRAN AND OATMEAL BATHS

Can be obtained at the Hetling Baths. These are efficacious in certain skin diseases, and arrangements are also made there for the treatment of specific ailments. The dry forms of eczema, psoriasis, lepra, senile prurigo and lichen planus, have been treated of late years most successfully. It is not desirable, as pointed out by Dr. Durand Fardel, of Vichy, to use sulphur waters extensively in gouty cases. They are found too stimulating, and this explains why certain well-known hot springs containing sulphur bring about such acute paroxysms of gout with but little previous notice.

NEW VAPOUR BATHS.

At the basement of the Queen's Baths new Vapour Baths are now approaching completion. Besides local

and general vapour with the needle douche, these baths will be furnished with reclining immersion baths. It will be a therapeutical boon to be allowed the opportunity of bathing after steaming. Pine baths can be procured to follow, if desired, in lieu of the plain mineral water, and when the strength of the patient will admit. There are very few better methods known for the treatment of latent gout or painful muscular rheumatism than the use of our steam series.

THE DRINKING OF THE MINERAL WATERS.

At the Hetling Pump Room for the past seven years a method has been adopted to raise the temperature of the mineral water from 114 to 150 Fahr. for medical drinking purposes, and this treatment has been prescribed either with or without the baths. It has succeeded in certain cases most admirably, such as gastritis, gastric catarrh, acute dyspepsia, flatulent discomforts, obstinate constipation, and suppressed gout. The usual water of 120 Fahr. during its descent into the drinking fountain passes over a steam coil which raises the temperature to 150, without any admixture or interference with its inherent properties. A chemical analysis by Ekin and Appleby has shown that no chemical alteration takes place during the super-heating. The potentiality of the Bath mineral water consists in its greatest heat. "Cooling processes render it as inert almost as distilled water." The effect of the increased temperature is to dissolve and wash out the glutinous mucous deposits of the stomach, gall ducts, and the upper portions of the small intestine, which are loaded in gouty cases with the initial elements of uric acid. The natural cooler water of 114 at the Grand Pump Room is much more tardy in effecting relief of the gouty and the asthenic dyspeptic. When flatulent distension, epigastric pain and eructation of food are present, much relief follows the hot drinking. With a strict diet, the avoidance of saccharine and starchy foods and a minimum of nitrogenous solids, drinks of the 150 mineral water, in six, eight, or ten ounces, twice or thrice a day, according to the orders of the physician, will be found most beneficial.



THE ANGEL.—“The Troubling of the Waters.”

This fine piece of statuary—work of the late Warrington Wood—was presented to the Bath Corporation by H. W. FREEMAN, on the expiration of his Mayoralty, to commemorate the Opening of the New Queen's Baths by H. R. H. the DUCHESS OF ALBANY in 1889.

UNIVERSITY
OF BRISTOL
MEDICINE

In early times huge quantities of the Bath mineral water were given in order to produce purgation. Such a method has been long abandoned. The hot mineral water at 150 produces rapid metamorphoses of the tissues, and in cardiac cases smaller quantities are carefully given during the progress of the cure. People with weak skins and too free perspiration must be cautious before proceeding with this branch of cure. There is not the slightest doubt that in early times our mineral water contained free sulphuretted hydrogen—in short, a sulphur water—and there is always a tendency, however infinitesimal, in cooling to throw off by volatilization some of its evanescent constituents.

We had hoped that the newly discovered elements, argon and helium, might have been found in large quantities in our mineral water, but in a recent communication of the writer with the Right Hon. Lord Rayleigh, it was elicited that his recent analysis proved, as Daubeny had previously stated, that the water consisted mainly of nitrogen, without oxygen or much carbonic acid gas. His lordship found a little argon, perhaps about 1 per cent., and traces of helium as indicated by the line in the spectrum called D 3. It was hoped at first that the so-called nitrogen might turn out to be mainly argon, but it was not so. And while we are on the subject of these new elements we may mention that Professor Ramsay's paper in the Chemical Section at the Toronto meeting of the British Association, 1897, showed that an attempt had been made to separate helium into fractions by diffusion. No new constituent was formed, but all the samples of helium contained small traces of argon. Runge, of Hanover, has stated that he and Professor Paschen have discovered that the spectrum of oxygen is analogous to that of helium, and contains two sets of three series each, so the hypothesis that helium

consists of a mixture of two elements must now be abandoned.

Mr. J. W. Morris, F.L.S., has for some time been engaged upon the investigation of the sands deposited by the King's Bath springs and the contents of the hazel-nuts found in the conduits leading therefrom. The sands afford in their organic remains evidences of communication with marine sources, while the non-organic evidences of igneous action at high temperatures are abundant. Within the closed chambers of the nuts a process of endosmosis has produced from the infiltrating waters not only dog's-tooth crystals of carbonate lime of singular purity, but arragonite in various forms, and salts of strontium in remarkable perfection. The full reading and interpretation of these observations have yet to be supplied.

A hot lime sulphated water such as we possess has inherent and powerful properties which no laboratory investigation can estimate therapeutically or otherwise. Dr. Sydney Ringer has proved the strong stimulating effect of calcium salts upon the heart. Lime sulphates, we consider, are the best known specific for the lurking pathological elements of gout and rheumatism in our system, and there is much merit in this so-called indifferent thermal water containing lime sulphates and its lesser chloride salts notwithstanding their temperature. Take for example the waters at Contrexéville, in the Vosges, and Wildungen, in the Principality of Waldeck. Contrexéville, with its Source du Pavillon, possesses a cold lime sulphated water with chemical analysis similar to our own mineral water, except its heat, for it is a cold spring. Large quantities are drunk at regular intervals during the day; as much as six or seven pints are deemed necessary for some patients. This water acts, apparently, not by virtue of its temperature, but chemically, by the presence of the lime sulphates and chlorides

contained therein. It is inherently a weak water; whether any mechanical action ensues, consequent upon the volume drunk, is, perhaps, open to question. But balneo-therapeutically there is no more powerful mineral water known to act upon the urinary organs for the elimination of uric acid and the oxalates, the latter probably being only an advanced stage of the former.

In the laboratory of my esteemed friend, Dr. Debout D'Éstrées, at Contrexéville, we have frequently discussed the probability of lime salts being the cogent factor of cure in eliminating the *materies morbi* of gout in its various ramifications in the human body. Dr. Debout's experience has been long and wide, and the suggestion amounts to a positive conviction that the calcium salts give the therapeutical value to all these indifferent thermal springs, Contrexéville included. A similar observation applies to Wildungen, the famous urinary resort in Germany, where much less water is drunk than at Contrexéville, and where the water is strong in carbonate of lime. I believe the late Dr. William Falconer in the last century advocated these views.

The quantity of hot Bath mineral water drunk medicinally is so small that we often find it most difficult to discover any immediate results through the evacuating channels. Yet beneficial results do follow, and are abiding, and the rapid absorption of the very hot mineral water after drinking makes us lose sight of the possibility of aiding and helping forward the absolute cure. Other health resorts, like those of Teplitz, Gastein, Wildbad, and Ragatz, possess indifferent warm calcium waters, which bear out the views we have given here.

In the process of cooling the Bath mineral water deposits its iron salts at 100 Fahr., retaining most of the calcium salts, and in the surgical wards of the

Royal United Hospital it has been the constant habit of the writer to prescribe in bladder and prostatic cases two or three pints daily of the mineral water cooled to the temperature of distilled water. In this form it produces diuresis, soothes and allays local irritation in a minor degree, similar to the Contrexéville water. Where a decided diuresis occurs on drinking our Bath hot waters, the urinary deposits yield a large field under the microscope of uric acid crystals, and in the so-called Sulis Water, our own mineral water cooled and highly charged with carbonic acid gas, we have a valuable water for exportation, which we regret is not more freely made use of. It is invaluable for gouty and rheumatic people, and is most useful when drunk at meals. The mild tepid natural mineral water at 114 may be drunk as formerly at the Grand Pump Room. The hotter water can be procured at the Hetling Pump Room only.

As we have previously stated, in chronic heart cases hot mineral water should only be taken when specifically prescribed, and in the dilated heart conditions with painful complications, many will find the water disagree, while it may even be harmful to their circulations, especially those who cannot afford to bear rapid tissue changes. Its indiscriminate use is really reprehensible under known conditions, and brings reproach upon all concerned.

Drugs are, for the most part, avoided with our patients in Bath. Calomel is given, as already explained, and strychnine in the weak cardiac muscle is invaluable. It has been doubted, however, in some circles, whether strychnine does act directly on the heart muscle. The heart, we know, gets fixed in strychnine poisoning in the dog in a state of spasm, probably through the vagi and cardiac ganglia. We believe, however, that Sir Grainger Stewart considers that strychnine acts on the arterioles, not on the cardiac muscle, but at present it is an open question.

DIET.

Little need be said here but to append a form of diet which for years has been found serviceable in certain cases of gout and rheumatism. It is not applicable to heart cases, as Oertel's form of dry diet is the more valuable.

DIETARY.

AVOID:—

Highly flavoured soups, all sweet cakes, tarts, pastry, stewed and dried fruits, and all saccharine things unless specially allowed. Malt liquors, all sweet wines, still or sparkling, liqueurs, free acids, pickles, ices, raw fruits and vegetables. In dyspeptic cases avoid particularly new bread, sweet biscuits, cheese, jams, marmalade, veal, pork beef, and made dishes; and in the gouty diathesis white meats are preferable to red, white fish to red, and vegetables, when allowed, should be well cooked. When stimulants are ordered, let them be taken *always* at meal times, and it is advisable to drink the bulk of the fluid at the end of the meal.

TAKE:—

Bread, toast, milk, eggs, poultry, fish, game, and fresh meat (except beef), once cooked, boiled and baked custard, farinaceous, cereal, suet, and Yorkshire puddings, cheese, cream cheese, well-cooked green vegetables, potatoes, baked or roasted apples, French plums stewed in plain water, tea or cocoa, cafe-au-lait. Alcohol in its various forms, and a light claret when allowed, with plain or a specified mineral water. It is suggested that all meals be taken regularly, and that the mid-day meal should, for the most part, be a light one.

MILK.

A course of sulphated and alkaline sulphated waters such as Franz Josef, Æsculap, Birmensdorf, Condal, Rubinat (the latter containing 10 per cent. of sulphate of sodium), Carlsbad, Marienbad, Franzenbad and Tarasp Schuls waters are most suitable for stout persons; but for lean persons the muriated waters, such as Homburg, Kissingen, Nauheim, Brides-les-

Bains, are preferable, and should be taken in their usually prescribed quantities.

THE NEW KURSAAL.

The new Kursaal, with free access to the great Roman rectangular Bath, will prove a great convenience to our water guests during the winter season. We are now brought into line with the Continental spas where the magnificent Kursaal is an object to admire, and a pleasant rendezvous for the "seekers after health." This building should be made full use of by our Corporation. It should be rendered attractive with the best music. The terraces should afford accommodation for dispensing light refreshments during the day, and in summer time delightful shade will be found below on the Roman scholæ. Bath is essentially a bathing and a drinking resort during the winter months. All the necessary comfort to ensure the success of the treatment has consequently to be sought within doors. No patient need be exposed to the inclemency of the weather in any possible way, as Bath chairs put down and take up their patients in the corridors at the very door of the bath-room.

Those who cater for the reception and care of water patients at the health resorts in England have much to learn from their Continental neighbours, with whom the comfort and pleasure of the visitor are the first consideration. Personal and general sacrifices are made for facilitating and expediting the cure of the patients, as well as for entertaining them in the intervals of their treatment. May we hope that the Bath Corporation will speedily introduce some of the simple methods so advantageously adopted and so much accounted of abroad for ensuring the success of the cure and promoting the welfare and enjoyment of the visitors to "the Bath." The importance of this feature in the administration of our balneological establish-

ment cannot be better expressed than in the words of the greatest living authority on the Spas and Mineral Waters of Europe, who in a letter to the author says : "I hope that you and your professional brethren and your influential townspeople will try to render the life at Bath as cheerful as possible, whatever the expense may be. Without this it is scarcely possible to compete with the best foreign Spas." *Verbum sap.*

