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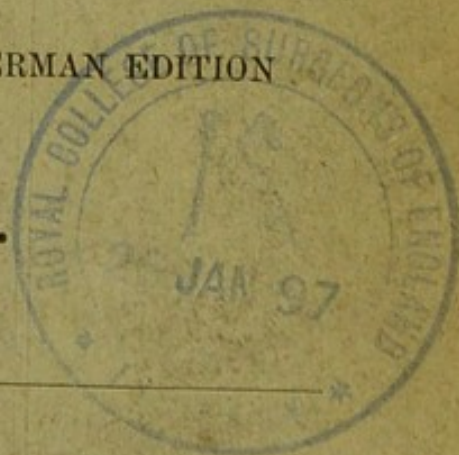
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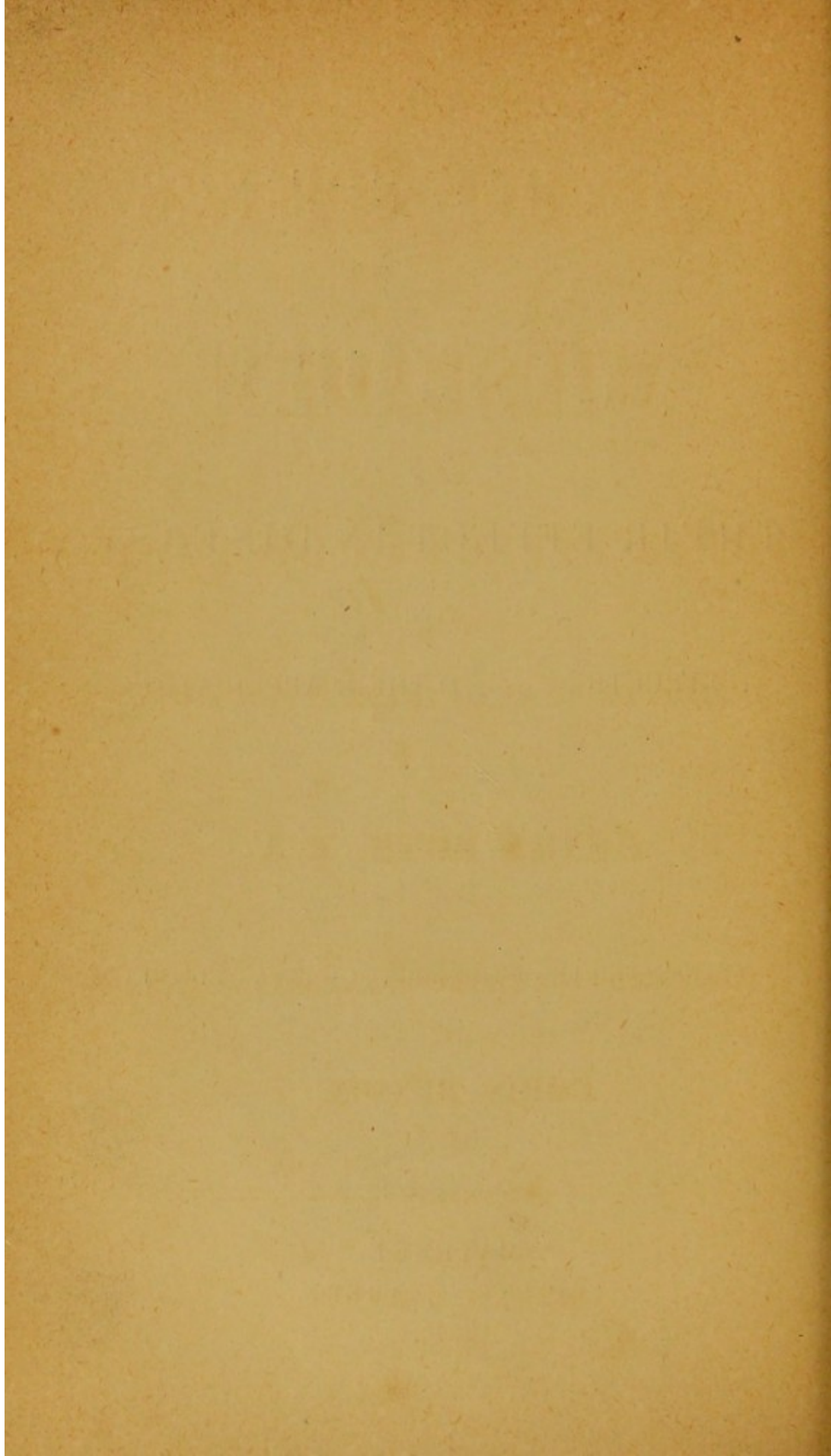
BY
HENRY ROTH, M. D.

TRANSLATED FROM THE FOURTH GERMAN EDITION

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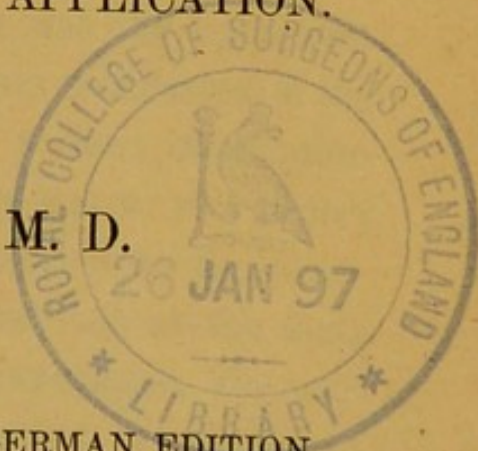
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THE
MINERAL SPRINGS

OF
WIESBADEN

AND
THEIR EFFECT IN DYSPEPSIA

AND
OTHER AFFECTIONS OF THE DIGESTIVE SYSTEM

BY
HENRY KOTZ, M.D.

TRANSLATED FROM THE GERMAN EDITION

BY
CHRIS. BENSON.

Printed by Victor v. Zabern, Mayence.

1870

P R E F A C E.

Unchanged in the fundamental principles, but enlarged by the results of wider experience this work appears in the fourth edition. In the preceding one some remarks on Wiesbaden as a winter resort were introduced, which have been omitted from these pages and will be offered in a separate form hereafter to that portion of the public who may have a special interest in them.

The chief object I have had in view was the consideration of the action of the Wiesbaden waters manifested in the various forms of disease. To this end a short description of the nature and origin of the morbid processes was added, in order to render the metamorphoses effected by the mineral water the more comprehensible. Inasmuch as the facts adduced rest upon the basis of ample experience, the conclusions arrived at will, it is hoped, escape the charge of seeking to prove too much.

The very nature of treatises on baths precludes the possibility of their being addressed exclusively to medical men; they unvariably fall into the hands of the laity, and must therefore be written in a familiar style. In Wiesbaden a popular account of the mineral water is particularly called for as persons often undertake a course without medical advice. This fact gave also birth to the idea of appending directions calculated to ensure rational application of the waters

and to enforce the necessity of observing regular habits. The assumption, however, can scarcely be a false one that the intelligent patient after convincing himself, by a glance over the following pages, of the complicated conditions of the morbid processes, will arrive at the conclusion that a successful exhibition of the waters requires more knowledge than is necessary to carry out the conventional treatment which dictats „21 baths“, perhaps with douches, and a course of drinking peradventure with an aperient result.

Granted that the present work, after repeated revisions, has been weeded of its primary defects, it is still far distant from the end sought wherefore I would recommend it to the kind indulgence of the reader.

WIESBADEN, June 1870.

HENRY ROTH, M. D.

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PHYSICAL AND CHEMICAL PROPERTIES OF THE KOCHBRUNNEN.

The water of the Kochbrunnen, the principal spring, is clear and colourless; slightly opalescent when a volume of water is examined. It has a faint, undecided smell and its taste resembles that of slightly salted broth.

In the basin, from which the water used for drinking is taken, its temperature is $153,5^{\circ}$ F. = 54° R. = $67,5^{\circ}$ C.; in the source itself it is $155,8^{\circ}$ F. = 55° R. = $69,25^{\circ}$ C.

The constantly ascending gases — nitrogen with traces of oxygen and carbonic gas — keep the water in a state of ebullition.

According to FRESSENIUS a pint of water (7680 grains) of the Kochbrunnen contains of solid matter:

Chloride of sodium	52,49779	grains
" of potassium	1,11974	"
" of lithium	0,00138	"
" of ammonium	0,12841	"
" of lime	3,61720	"
" of magnesium	1,56603	"
Bromide of magnesium	0,02760	"
Iodide of magnesium	traces	
Sulphate of lime	0,69289	"
Phosphate of lime	0,00299	"
Arseniate of lime	0,00115	"
Carbonate of baryta	traces	
" of strontia	traces	
" of lime	3,21055	"

Carbonate of magnesia	0,07979	grains
" of protoxide of iron	0,04339	"
" of manganese	0,00453	"
Silica	0,46018	"
Silicate of alumina	0,00392	"
Organic matter	traces	
	<hr/>	
Total solids	63,45720	grains
Carbonic acid	6,416	cub. in.
Nitrogen	0,103	"

According to the above summary $\frac{5}{6}$ of the solid matter contained in the water consists of *common salt* (chloride of sodium), which is hence evidently the most important agent when the waters are applied internally. An influence altogether subordinate is that of the chloride and of the carbonate of lime, if one reflects on the quantity conveyed into the body daily with the internal use of the water. In many diseases which can only be successfully treated by the administration of small doses, the assimilation of these elements into the blood, during the whole course, may indeed be pronounced insignificant.

Still further into the background retreats the importance of the other elements, which are barely represented. Their effects indeed during a favourable exhibition of the mineral water do not admit of definite proof; with reference to the iron especially some phenomena show that in connection with the salt it manifests no tonic effect.

The *volume of carbonic acid* only equals that contained in ordinary drinking water: thence cannot be said to exert any special influence. The absence of any considerable volume may be regarded on the contrary as favourable to the Wiesbaden water. Thus its efficacy in case of chronic gastritis is not impaired by the increase of the abnormal air-contents of the stomach, nor by the irritating effect of the carbonic acid. On the other hand its favourable influence in diseases of the kidneys cannot be lessened, inasmuch as the urine remains free from the formation of considerable quantities of oxalate of lime — the usual consequence of the

exhibition of fluids strongly impregnated with carbonic acid. The very small quantity of gas contained in the Wiesbaden waters even ensures to the baths the soothing influence sought to be obtained by the usual method of treatment.

For disorders accompanied by great debility, even in stomach catarrh, when the patient's strength is considerably reduced, waters containing a larger proportion of carbonic acid are on the contrary to be preferred, as these affections call for the vivifying action of the gas.

The *high natural temperature* of the water on its escape from the earth's bosom is beyond question a marvellous phenomenon of nature; it is notwithstanding equally beyond dispute that its remarkable and incontestible efficacy is not attributable to the great heat, equally in vain would it be to suppose that the agency of heat involves exciting properties, in as much as the water is not applied at its natural temperature; but at one suited to the individual constitution and best adapted to effect the end in view.

Only in certain cases, such as chronic catarrh of the stomach, of the intestines and of the respiratory organs, is the high temperature of the water drunk of some importance; for then its action is directly soothing, and small doses suffice. In all other diseases experience dictates that a temperature approaching that of the stomach and the interior of the body is the most efficacious. Such a mean temperature, adapted to each special case, invariably facilitates the assimilation of the water by the blood, in other words, the digestion of it, by which the favourable action is encouraged.

On the other hand alvine evacuation is not immediately promoted by the Wiesbaden waters — which from their saline constituents might justly be anticipated — on account of the heat. Only in a very small number of cases is it desirable to favour this action, which may be done by reducing the temperature of the water.

For baths the Wiesbaden waters are never employed at their natural temperature; but are always cooled down to the desired heat. To be sure, the very high temperature

of the source is often during the height of the season a serious obstacle — as it is not easy to procure a sufficient supply of cooled water for the immense number of baths required. This problem is one which in Wiesbaden still awaits solution.

The following comparative tabular statement of the most important mineral waters, employed in the treatment of the same diseases as those for which the Wiesbaden springs are indicated, will facilitate a just estimate of their virtues.

	Temp. F.	Total contents, Grains	Chlor. of sod. (Sulph. of sod. and potass.) [Sulph. of magnes. and lime.]	Iodid. of sod. (Brom. of sod. and magnes.)	Chlor. of lime (or magnes.)	Carbonate of lime and magn. (Carbonate of soda.)	Carbonate of protoxide of iron.	Carbonic acid. Cub. in
Teplitz	118,6	4,84*	0,43 (0,43)			0,32 (2,68)	0,037	0,39
Baden-Baden	153,5	23,14	16,00 [3,00]		1,75	1,66	0,10	0,5
Aachen	135,5	31,50**	20,27 (3,35)	0,004 (0,027)		1,21 (4,99)	0,07	4,06
Soden 3.	72,5	36,72	26,31 [0,31]	(0,005)		7,81	0,009	35,9
Cannstatt	69,8	38,60	16,29 (7,69) [6,43]			7,89	0,16	23,5
Karlsbad	164,8	44,49	8,72 (24,33)	0,02		2,01 (9,01)	0,03	33,7
Adelheidsquelle (Heilbrunn)	50	46,19	38,06 (0,04)	0,21 (0,36)		0,58 (6,21)	0,07	13,18†
Wiesbaden	155,8	63,45	52,49	(0,027)	3,61	3,21	0,04	6,46
Kissingen	52,3	85,36	62,05 (2,00) [2,50]	(0,702)	(6,85)	6,05	0,68	26,25
Kreuznach	54,5	93,71	72,88 (2,41)	0,03 (0,27)	13,88 (4,07)	1,69		3,9
Homburg	50,9	102,12	75,73††	(0,02)	5,27 (5,59)	11,81	0,17	48,6
Soden 4.	70,2	127,82	109,30 (2,41)		10,08		0,11	29,9
Nauheim	90,5	220,41	181,24	0,07	14,86 (2,60)	16,38	0,50	12
Rehme	87,8	307,08	240,04 (25,18) [22,66]	(0,01)	(9,00)	9,86	0,33	21,55†*

* The following waters have still less solid constituents: Wildbad 3,58, Chlor. of sodium 1,28, temp. 95° F. — Gastein 2,62, Sulph. of sod. 1,49, temp. 115,2° F. — Pfäfers 1,78, temp. 97,2° F.

** Besides 0,07 Sulphuret of sodium.

† Plus 8,02 sulphuretted hydrogen, 6,54 nitrogen.

†† Plus 2,65 Chloride of potassium.

†* Free and combined with carbonates.

Leaving aside the sources containing few mineral constituents, whose healing virtues are specially attributable to the baths, it will be seen that the Wiesbaden water, from

its chemical constitution, is one of the simplest nature: it contains little else than chloride of sodium, a substance which not only plays an important part in the digestive process; but is an integrant component of the blood. Other salts, more foreign to the economy, are entirely wanting. The sulphates, for instance, such as Glauber's salt, would not augment the wholesome influence of the Wiesbaden waters in stomach-catarrh, nor further their powerful action after absorption by the blood, but would rather by their purgative influence neutralize these good effects. Iodides and bromides are but barely represented in the Wiesbaden water. The quantity absorbed during a course of any mineral water, being so infinitely minute, it is not possible to assign to it any remarkably curative influence.

The Wiesbaden waters are to a certain extent dietetic in their composition and constitution and are therefore a mild and appropriate medicament suited to the general economy of the body. This speciality will appear the more striking if their chief ingredients, in regard to quantity also, be compared with the corresponding fixed elements of the aforementioned sources. Whilst containing sufficient chloride of sodium to induce powerful action, the Wiesbaden water in this respect, far more nearly resembles the milder springs. Hence when taken internally it neither oppresses the organs of digestion, nor fatigues the organisation, which would not fail to happen if its saline components and its other fixed parts, were augmented. Even in the form of baths the water does not lose this characteristic, for under its exhibition no cutaneous irritation is manifested, and it rarely produces eruptions.

In short, to sum up, the *Wiesbaden water* may, in regard to its therapeutic value, be compared to *warm salt water*.

NOSOLOGICAL SPHERE OF THE WIESBADEN WATERS.

Although, as is the case with all old places possessing thermal springs, Wiesbaden's ancient fame was based exclusively upon the healing virtues of her waters in the form of baths; the town nevertheless contained of yore a shrine to which pilgrims, seeking to be loosed from infirmities of all kinds, constantly journeyed. Only, as other mineral springs were discovered, was the sphere of action of Wiesbaden's waters limited to diseases of a certain class, and gradually rheumatism came to be the recognised representative of nearly all disease in which their exhibition was indicated. True, in earlier times, some more astute and penetrating medical men had not overlooked the possible advantages to be derived from internal use and proved its efficacy; it remained however to the last past decades to render their internal prescription a thing of daily order. Dating from this epoch a much wider field of action was displayed and it was soon shewn that the application of a water so happily constituted, with reference to its saline components, might advantageously be extended to all diseases admitting the use of saline waters.

It is from this point of view that we shall consider in the present treatise the effect of the Wiesbaden waters in all curable maladies, as well as their effects in those diseases where their action would be pernicious. In the first place we shall discuss the phenomena of their action in relation to morbid processes and their causes, thus forming a scale by which to estimate the therapeutic action of the mineral water.

CHRONIC CATARRH OF THE STOMACH AND INTESTINES.

For many years past the repute of the efficacy of Wiesbaden waters in abdominal disorders has rapidly augmented. Formerly, according to the medical creed and practice of the day, and in obedience to the theory of obstructions of the bowels (*stasis abdominalis*), all patients suffering from abdominal affections were invariably sent to sources whose properties were essentially laxative. Of late however this system has fallen into complete disuetude — how completely, is evident from the fact that it has been abandoned even in places possessing strong saline waters. Abdominal disorders frequently occurring as consequences of chronic maladies, especially of rheumatism, first afforded in Wiesbaden the opportunity of testing the advantages derivable from the use of the waters. In most cases the patient himself observes the surprising rapidity with which the desired results are obtained. In this respect the success accomplished by the Wiesbaden waters is much greater than in the sphere embracing long-standing articular rheumatism.

Chronic catarrh of the stomach.

Nature and symptoms of the disease. — It is based upon an irritated condition of the membrane clothing the interior of the stomach, with swelling of the epithelial cells, as also of the glandular system to a certain extent, and accompanied by plethora of the whole organ. The digestive process is, as a matter of course, debilitated, and is not accomplished within the small limits assigned by nature. An abnormal process of fermentation is established, acidity of the stomach with pyrosis follows, and an excessive amount of gas is developed producing a sensation of fulness and oppression culminating sometimes in colic pains and vomiting. The feeling of hunger, the sensation of positive emptiness of the walls of the stomach is wholly wanting on account of their abnormal condition and augmented sanguineous contents; thirst is caused by the catharral irritation; the small quantity of

nourishment taken by the patient retards peristaltic movement and the stools become slow and difficult.

Causes. — Chronic catarrh of the stomach rarely arises from preceding acute catarrh; but is rather the result of certain long continued disturbing influences: improper diet; the abuse of alcoholic liquors; too much smoking, &c. Sedentary life; insufficient bodily exercise encourage its development. Stout persons, subject to watery alvine evacuations, repeated several times daily, and whose digestive organs are in an irritable condition, evince a marked predisposition to chronic catarrh of the stomach.

More frequently still this malady accompanies other chronic disorders allied to anomalies in the circulation of the blood — in pulmonary affections for instance, or to disturbances in the general economy of health, more especially to an enfeebled nervous constitution. Precisely these complications constitute common objects of treatment and their eradication is of vast importance in ameliorating the principal malady. It is not necessary to add that the cure of simple chronic stomach-catarrh proceeds more rapidly than where the catarrh is an important complication.

Result of treatment. — The Wiesbaden waters administered in moderate and proportionate doses cause the immediate disappearance of the flatulency, of the sensation of fulness, eructations, &c. The disappearance of these abnormal symptoms is followed by return of appetite, cessation of thirst and in the course of treatment the alvine evacuations become regular and normal.

The progress of the cure is by no means promoted if the action of the water be purgative. It is in vain to expect some amelioration of any of the symptoms, or the return of appetite, if a purgative system of exhibition is persisted in. Thirst endures and the evacuations, apparently regular, in reality have not at all been restored to their normal state.

However favourable may be the influence of Wiesbaden waters in chronic catarrh of the digestive organs, it is retarded to an extraordinary degree so soon as the *patient's condition is one of extreme debility*, and only with the revival

of strength does it become more manifest. With patients advanced in years their effects may be expected in vain. In cases of *catarrh dependent upon nervous affections of the stomach* (dyspepsia), the Wiesbaden waters afford but little relief. *Digestive disturbances*, by which those *addicted to drink* are attacked, generally undergo amelioration only at the beginning of the complaint. If the organic alteration of the stomach is advanced, if there is yet any adipose degeneration of the liver, and the constitution is seriously affected, the action of the waters is null. *Excessive smoking* exercises an equally pernicious influence upon the digestion, giving rise to inertia of the bowels, which generally resists the waters.

All these cases exhibit the peculiarity that the loss of appetite and retarded evacuation, augment, in proportion to the quantity of water taken.

Chronic ulcer of the stomach.

The usual precursor of this disease — which is chiefly found among women — is nervous dyspepsia. It would appear that the disturbing effect of the abnormal products of fermentation on the tissues of the stomach may lead to the decomposition of the mucous membrane. Nervous debility occurs not less frequently among men, though the different habits and manner of life modify the aspect and character of the malady.

If the more acute stage of the disease has been got over the good effects anticipated from the use of the Wiesbaden waters are generally produced. If in rare cases they do fail it is for some reason which hitherto has defied explanation. The nature of the evil forbids the supposition that the cure of ulcer of the stomach can progress, as rapidly as does, almost without exception, that of simple stomach-catarrh; although it sometimes proceeds with marvellous rapidity. The first symptom of improvement is here also cessation of the rising in the stomach, of the eructations and the troublesome feeling of oppression; no symptoms indicative of irritation succeed.

Vomiting of blood, even of recent date, and acute pain, form no counter-indication for the exhibition of the water. If, judging by local symptoms, the pains manifesting themselves during the attacks, are shewn to arise from an inflammatory condition of the peritoneum, they are only overcome after a series of relapses. Yet, it has been proved that even obstinate cases of long standing have undergone sensible amelioration. I have seen a case in which the autopsy subsequent to a fatal hemorrhage, shewed a considerable thickening of the mucous membrane of the stomach which served as the basis of the ulcer; notwithstanding which the Wiesbaden waters had removed all morbid symptoms two years previously.

It is self-evident that the exhibition of the mineral water must be confined to a narrow circuit and demands a very strict regime of life. In the cases which I have treated the diet prescribed was one consisting chiefly of meat, rather than of milk, so that the beneficial effect produced must be chiefly ascribed to the mineral water.

Chronic intestinal catarrh with diarrhoea.

The Wiesbaden water, on account of its composition and temperature, is worthy of special consideration in chronic diarrhoea and predisposition thereto; though inveterate cases by no means renounce the obstinacy of their nature in which they even surpass stomach ulcers.

In referring to stomach catarrh mention was made of *catarrhal digestive disturbances in corpulent people*, accompanied by frequent diarrhoea-like evacuations, to which however, from force of habit, no importance is attached. The consequences of this affection will be discussed in treating of hemorrhoids and abdominal plethora; and it will suffice to remark here that the Kochbrunnen water rapidly exerts a beneficial influence on the digestive process.

Neglect of acute diarrhoea occasionally gives rise to *simple chronic intestinal catarrh*, particularly when strength was deficient at the commencement of the disease; whence also arises the tediousness with which the cure proceeds.

By a timely administration of the Wiesbaden waters it is even possible to limit and to cure *the intestinal affections in tubercular disease*, provided that the character of the malady is simply catarrhal. The cure of the catarrh is of great importance in ameliorating the principal disease.

Chronic diarrhoea demands not only a soothing; but a prolonged course of treatment, lasting until the renovation of the destroyed epithelial cells of the mucous membrane has been accomplished, and the recovery completed.

To the class of intestinal affections may be added certain abnormal conditions as: constipation, hemorrhoids, plethora abdominalis of which we shall first treat, although they are in themselves only *symptoms*, and not properly speaking diseases.

Constipation.

Inert alvine evacuation is, according to the foregoing, the usual consequence of *chronic stomach-catarrh*. In the same manner *chronic jaundice* is accompanied by constipation. *Nervous debility*, of old date, frequently produces obstinate constipation and comes under observation here in connection with neuralgia.

Many instances of irregular evacuation may be traced to purely *mechanical causes*. In this respect diseases of women and abdominal tumours have the same effect as has advanced pregnancy; previous intestinal disease (inflammation, severe typhus) may have obstructed the passage by adherence.

In cases of the last named description it is difficult to abstain from prescribing certain drugs. Where nervous debility has to be taken into consideration, the exhibition of Wiesbaden waters cannot be appropriate because it would only increase the constipation. Its use, however, will restore, the normal stool as soon as the catarrh of the stomach and of the biliary ducts has been overcome.

If constipation is a consecutive condition of another disease, it cannot in itself indicate the application of a mineral water, not even then when it is conjunctive with chronic stomach and intestinal catarrh. The old system of having recourse, without further ado, to purgatives, hence appears essentially irrational and, though affording relief, will not produce permanent amelioration.

The admissibility of baths in constipation often requires a certain amount of consideration as to whether it be not desirable to suspend them until it has been reduced by the internal use of the waters. Applied alone they rather retard than promote the movement of the bowels.

Hemorrhoids — Piles.

In speaking of *chronic intestinal catarrh* mention was made of that dilatation of the blood-vessels of the rectum, called: hemorrhoids. The difficulty of circulation is in this instance induced by the continuous irritation of the mucous membrane and the consequent retarded circulation. The nearer to the rectum is the seat of the catarrh so much the more easily are the changes produced. *At this stage of the circulatory disturbance*, when the acute attacks are still diminishing, the hemorrhoidal troubles vanish with the disappearance of the intestinal catarrh upon application of the Wiesbaden waters. If the degeneration of the tissue of the intestines is advanced, the vessels are dilated and other symptoms arise, such as: prurient eruptions, purulent secretion of the adjacent parts and neuralgic pains; the complicated morbid condition is beyond the reach of mineral waters and demands the application of local remedies.

Every impediment to circulation in the intestine itself, or in the central vascular system, interfering with the reflux, gives rise to stagnation in the venous circulation in the intestine and, according to physical laws, chiefly in its lower extremity. Among these causes we may enumerate the pressure exercised by abdominal tumours, an abnormal position of the matrix, accumulation of fæces in the intestine itself, arising from chronic constipation, produced by nervous debility,

further, morbid compression of the hepatic vessels in which the intestinal veins debouch, some diseases of the heart and of the lungs, in which organs those vessels as it were terminate.

Independent hemorrhoidal disease does not exist as cause of any malady whatsoever. The dilatation of the vessels of the rectum invariably results from some other disorder, which, as a matter of course, may temporarily be relieved by the hemorrhoidal flux. Like many other maladies piles are hereditary; but only in as far as they recur in individuals of like constitution and develop under conditions of life which resemble each other. To pretend to explain the nature of a disease by the presence of hemorrhoids is perfectly inadmissible, inasmuch as they are either the consequence of the malady in question, or pure accidents. The various causes whence piles proceed must as a matter of course determine the system of treatment adopted for their cure. Their development also must naturally be taken into consideration. The employment of purgatives, formerly the stereotyped prescription, is entirely at variance with the system of scientific medicine. Under certain conditions Wiesbaden waters may still prove efficacious in hemorrhoids arising from diseases of the lungs or womb.

Plethora abdominalis.

Persons of robust constitution who, with advancing age, have grown stout, suffer from plethora abdominalis. Their stature and fresh complexion and frequent échauffements betray a *fulness of blood*, whose character however is watery, deficient in saline components and contains but few red globules, although albumine is abundant.

Préëxistent chronic intestinal catarrh, accompanied by liquid, slightly coloured stools, causes excessive gaseous formation, and impairs the digestion more particularly of fatty aliment. Abnormal fatty deposits and adipose degeneration are induced, and the pressure exerted by the air-inflated intestines upon the large vessels of the abdomen, produces the sensation of échauffement so painful to invalids.

The liquid stool; tendency to perspiration; the injurious habit of taking too much liquid nourishment — against which Banting violently protests — gradually deprive the blood of its saline constituents more particularly of its muriate of soda. In the course of time the body loses its energy; the nervous system becomes irritable and the frame of mind hypochondriacal.

On account of the social position of the patient, frequently affluent, an abdominal plethora is presupposed, and from the distended condition of the abdomen an enlargement of the liver might be argued. The pressure maintained by the intestinal gases itself forbids already the possibility of the existence of the latter, and stasa have never been proved. These patients are generally supposed to have a tendency to gout, as also to hemorrhoids and to apoplexy. True, a susceptible skin is often attacked by rheumatic and neuralgic affections, and the habitual intestinal catarrh often causes urinal deposits, generally mistaken for gravel. Apoplexy, too, does *not often* occur among them, *still less frequently* are they troubled with gout.

It is then no imaginary fulness of blood; but rather an intestinal catarrh and its effects that should form the object of treatment, to which as will readily be perceived purgative remedies lend no aid. To bring about the cure of long-standing disturbances in the digestive functions; to promote nutrition and to restore to the blood its healthy constitution by furnishing the muriate of soda which it lacks, are just offices effectually performed by the Wiesbaden waters. The rapid diminution of gas, producing the abdominal distention, causes the unpleasant échauffement to vanish. Thirst no longer torments the patient and the desire is lost to inundate the body with fluids. The usually puffy look disappears and the dimensions remarkably decrease. The stool soon becomes regular and darker, and the urine deposits cease. The mind becomes more vigorous and the mood more equable in proportion as the bodily functions get healthier.

DISEASES OF LIVER.

Compared with maladies of the stomach and intestines, disease of the liver, relatively speaking, rarely comes under our observation in Wiesbaden, and this for the simple reason that it occurs far less frequently, than usually supposed; for deep-seated liver affections invariably endanger life. The position occupied by the liver, and its peculiar connection with the vascular system, may protect it from disturbing influences of which only a few appear to be in intimate relationship with the organ. Hospital statistics rarely shew more than a small per centage in proportion to other diseases, jaundice still being the form usually represented.

Morbid symptoms in the region of the liver are not invariably to be referred to a disease of that organ and the result of happy treatment does not prove the correctness of such diagnosis; for the good effects evidenced may be traced to the amelioration of some altered condition of the stomach, &c. Thus the supposed affection of the liver, in corpulent individuals, will usually resolve itself, as we have stated, into intestinal catarrh. Pains in the right side of the upper part of the abdomen most frequently arise from some *affection in the colon*, which makes an acute angle beneath the liver. These pains are however just as likely to proceed from the *stomach*; sometimes their origin is *neuralgic*; they may rarely be connected with diseases of the *female sexual organs*. The symptoms in question by no means correspond with the recognised symptoms of disease of the liver, in many cases even jaundice does not exist, nor is there any trace of gall-stone. Physical examination usually proves clearly that these pains lie without the limits of the liver.

If disorders in the abdominal regions are accompanied by so-called: liver-spots (*éphélides*), these do not indicate liver-disease, but are simply innocent vegetable growths or, in the case of women, deposits of pigment.

As the majority of pretended liver-complaints usually proceed from disordered digestion, the efficacy of neutral saline waters will be evident, which on the other hand has

given rise to the idea that in advanced age corpulent persons are subject to diseased liver.

Chronic jaundice.

The Wiesbaden water affects a cure in the most common and simplest form of the disease; that proceeding from stomach-catarrh. As the immediate action is confined to the stomach, and the chief constituents of the water only unite themselves with the biliary ducts by means of the circulation, the progress of the cure is slower than in stomach-catarrh.

Chronic inflammation of the liver.

This disease is usually connected with the abuse of alcoholic liquors and rarely occurs with the patients who frequent baths. Catarrh of the stomach, arising from the same cause, always complicates the affection of the liver. If the Wiesbaden water is administered immediately upon the symptoms presenting themselves in a persistent shape they disappear under its influence, and, judging by the complexion and renewal of strength a complete recovery takes place. More extended lesion indicated by hemorrhoidal attacks, suspicious colour, slight oedema, forbid the possibility of reactionary renewal of a normal condition. The amelioration formerly possible can no longer be hoped for, profuse hemorrhoidal loss may even supervene.

Adipose liver.

This form of disease does not manifest itself by any symptom; but with children it is frequently the cause of *deep-seated disturbances in nutrition, important* as accompanying them. Massive bodily development, thick deposits of fat, distended stomach, with scrofulous accidents of all kinds, morbid stomachic and intestinal digestion of old date, — such a complication is frequently united with adipose liver.

A methodic internal course of the water rapidly changes the nutrition, the too massive development diminishes, the child grows, the features become more pronounced, the liver reassumes its natural dimensions and the child becomes more cheerful.

Adipose liver, as an accompaniment of consumption, almost invariably defies observation; its amelioration would be of importance in treating the principal disease.

AFFECTIONS OF THE SPLEEN.

Although belonging to the more unusual forms of disease met with at watering-places, cases of *swelling of the spleen traceable to intermittent fever* do nevertheless sometimes come to Wiesbaden from Holland or the Palatinate. If the malady is not yet inveterate, it will soon improve, simultaneously with digestion and nutrition. A more aggravated case of degeneration of the spleen coming from the lower provinces of the Danube, and complicated with phthisis, of course derived no benefit from the waters.

In several instances of *leucamic enlargement of the spleen*, the result was, to say the least, satisfactory. A child, eighteen months old, whose whole development, very pale complexion, and distended abdomen, in addition to other functional derangements, told of a considerable enlargement of the spleen and of a peculiar state of the blood, perfectly recovered under the internal use of the Wiesbaden water. With the subsidence of the enlargement, the number of white blood globules also diminished. Two adults affected with tumours of the spleen certainly obtained from the saline water much greater benefit, as regarded their general condition, than they had derived from a strongly impregnated steel spring, which they had tried before. Their digestion became very good, their urine without sediment, and their complexion of a natural colour. In one case even the spleen grew somewhat smaller; but the use of the waters was entirely without influence on the indurated enlargement of the other patient.

The treatment must however be commenced at an early stage of the disease, and with reference to tumours following on intermittent fever, it is important that Wiesbaden be free from fever.

In these diseases observation confirms the fact, that the *Wiesbaden water* has the general power of *limiting the volume of the spleen*, and more evidently when the size of the organ is augmented; an enlargement of which the patient is often ignorant. (See the second German edition of this work.)

CHRONIC INFLAMMATORY DEPOSITS IN THE PERITONEUM.

Most frequently hitherto *deposits remaining after inflammation of the coecum* (typhlitis) required treatment at Wiesbaden. Amongst young people cases of this kind arise, as a rule, from chronic catarrh of the coecum and its appendix and they show a great tendency to relapse. Herein lies the danger of the typhlitis, especially as the exudation is liable to become considerable. During the exhibition of the Wiesbaden waters the process of the retrogressive metamorphosis can be distinctly followed. Besides, a persistent application *protects against fresh outbreaks* of the inflammation, inasmuch as it cures the long standing catarrh of the coecum. In this respect the peritoneal deposits are closely allied to catarrh of the stomach and of the intestines.

Inflammatory affections of the uterus are frequently followed in the enveloping peritoneum by *similar morbid products* after catamenial irregularity, and still more frequently after severe illness during confinement. In the latter case, abscesses sometimes supervene, which empty themselves in some way or other, and are called *abscesses of the pelvis*.

Without regard to the necessary local treatment, a cure may be promoted by drinking, and bathing in the Wiesbaden waters. The abscesses heal very quickly. Tumours, often of large size, naturally require a longer course of application before absorption takes place. During the progress of the cure, the neuralgic pains, which are often present, cease, menstruation again becomes regular, and the languid and suffering condition gives place to health.

DISORDERS OF THE AIR PASSAGES.

The writings of former Wiesbaden physicians (even those of RITTER, 1800) afford many lively descriptions of cures of severe forms of chest diseases wrought by the waters. Although other spas may perhaps, from their more bracing summer air, be better adapted to the improvement of such maladies, the *Kochbrunnen* is still in its character and constituents quite equal to and often surpasses its rivals in its soothing action on these troublesome diseases. (See analytical table.) In every season too the Spring has no lack of opportunity of maintaining its great reputation, as catarrh of the lungs is not seldom a complication of rheumatic affections common in Wiesbaden. As to winter-treatment our spa deserves that greater attention be paid to the remarkable efficacy of the mineral water in checking the progress of the disease. One may also mention that the *Kochbrunnen* is employed by the inhabitants as a popular remedy against catarrhs, although its use during the stage of irritation, as often happens, cannot be approved of on scientific grounds.

Chronic catarrh of the nose.

In childhood this disorder is often troublesome and then easily induces an obstinate ozæna. Simple chronic nasal catarrh is most easily cured at Wiesbaden by means of proper attention to hygienic rules, and needs no local application. Ozæna always requires a long course of treatment; on account of the uncertainty concerning the extent of the disease, the degree of success cannot always be accurately foretold.

Chronic catarrh of the throat.

True catarrh with *swelling* of the dark-red and relaxed mucous membrane, and consequent *narrowing of the throat*, such as mostly occurs in strong men, is here referred to. Besides the copious secretion of mucus the patient is annoyed by a feeling of discomfort and pressure, seldom by pain. The voice is generally somewhat altered on account

of simultaneous irritation of the larynx. Thickening and redness of the mucous membrane disappear tolerably soon, if the patient live rationally and the treatment be methodical.

Although this disorder is not frequent, yet *a simple state of irritation of the throat* is often to met with. This is certainly the most frequent form of affection of the throat, and is sometimes of quite a harmless nature, but sometimes an accompaniment and symptom of consumption, that afterwards becomes serious. In ordinary life one speaks of catarrh, but at most it exists but transitorily and in a slight degree. The cavity of the throat is here *enlarged*. All parts are thin, attenuated, even emaciated, not alone when phthisis is in question, and this condition is co-incident with defective nutrition and emaciation of the body. Occasionally swollen glands in the posterior and lateral angles of the throat do not alter its general aspect. These together with the edges of the palate, and the uvula, may be overspread with a red colour, and after repeated attempts at clearing the throat (hawking), the redness may have diffused itself pretty generally, yet in spite of this, the ground colour remains of a pale, faded tint. In the throat there often spring up, in marked contrast, minute distended bloodvessels. Neither they, nor that redness, prove the existence of inflammatory irritation, that is, of catarrh.

Tickling, burning sensation, dryness, a constringent feeling, a troublesome short cough, torment the patient from morning to night, and make a veritable martyrdom. Naturally in the attenuated mucous membrane, which permits the small vessels to be seen distinctly through it, the nervous filaments lie very superficially and are exposed to every injurious influence; are sensitive to dust, smoke, the passage of dry air, the excitement caused by speaking, clearing the throat, and coughing. The constant complainings, also in simple forms of the disease, are out of proportion to the local change; the inconvenience is the more felt, because the patient does not possess any superabundant strength.

As the simple form of the disease, but not that accompanying consumption, is peculiar to women, although men

are by no means strangers to it, so herein we have a hint of the special origin of the gradual pharyngal irritation. The habit of hawking, smoking, &c. merely promote this irritation and at length a chill suffices to call it out.

The Wiesbaden water effects nothing more than other appropriate remedies and mineral waters can do, but it always when taken inwardly soothes the troublesome symptoms on account of its warmth, and is especially useful in the simple form. With restoration of the digestive functions and the return of strength, the waters may effect a permanent cure; inasmuch as treatment, essentially tonic, is alone beneficial in this affection. In consumptive cases this principal disease must furnish the primary indication to the medical man, even if the throat affection appear early in the foreground with its correlative symptoms.

Chronic bronchitis.

The similarity of this disorder with the catarrhal affection in chronic pneumonia, or consumption as it is called, often makes it difficult to define the limits, where the more serious disease begins. Therefore in a practical point of view it is requisite to give the greatest attention to chronic catarrh on account of its possible consequences.

Slight and frequent *recurrences* of bronchial catarrh in *adults* may awaken some suspicion of phthisis. HUFELAND considers a six weeks' continuance as suspicious, and the newest doctrine about consumption approximates to this view. In eradicating the last traces, a course of mineral waters accomplishes much more than the usual home treatment, and Wiesbaden can likewise boast of perfect success.

Greater precaution still is requisite if *inflammation of the bronchial tubes* (bronchitis), or *acute inflammation of the lungs* has not completely ended, but has left catarrh behind. Then remains of exudation in the affected mucous membrane of the air passages or in the lung cells ought always to be eliminated. From them frequent relapses in both diseases no doubt occur. As a prophylactic measure against relapse and the transition to phthisis, a course of mineral water should

follow. Wiesbaden and saline waters the more readily promote recovery, because firstly they remove those remains of exudation, secondly regulate the generally deranged digestive organs, and lastly replace the loss of a considerable quantity of common salt in the blood. Under their use expectoration quickly diminishes and the irritating cough proportionally decreases, whilst appetite and digestion improve, and convalescence is established.

Such a tendency to chronic pneumonic processes after inflammatory affections of the chest occurs less frequently in youth; yet *catarrhs which remain after hooping-cough, measles, and repeated attacks of inflammation of the lungs* form an exception. The more therefore should these be eradicated by systematic treatment, that by means of saline water being the best, lest the development of the body should be retarded.

What is the consequence of neglecting this precaution in childhood, is taught us by the *habitual catarrh* attended with a *rattling cough in young persons*. The retarding reaction on the constitution is always plain to be seen. There is no consumption, but only *chronic bronchitis*. A short time ago BEHREND again drew attention to this point, and to the fact that cod-liver oil and such like remedies effect no good, but that change of abode and Karlsbad waters are beneficial, the latter on account of their preventing disturbance in the function of the liver. Whether the liver really proves to be diseased is unknown to me, yet traces of jaundice are certainly sometimes seen, of course as a secondary result of the retarded pulmonary circulation. The removal of the chronic catarrh is the principal task also as to a possibly existing jaundice, and here saline water proves the most serviceable remedy. The decided efficacy of the Wiesbaden waters has already been mentioned in the second German edition of this work. Even the internal use of the water is alone sufficient, but it must be taken for a long time.

Youth, as far as chronic diseases are concerned, has a great advantage over age, for with a fresh accession of nutrition, the body, already engaged in development and again

making progress therein, is able to efface all traces of former disease.

Consumption.

As a complication of chronic articular rheumatism; consumption not seldom requires attention at Wiesbaden, if during the acute stage of rheumatism; bronchitis or inflammation of the lungs has accompanied it and resulted in chronic pneumonia. Almost yet oftener does consumption proceed simultaneously with neuralgic disorders of different kinds, and as a prior disease, of old date, does it induce a weakness of the constitution, in which state the irritability of the nervous system has its root, and on which neuralgia proper erects itself as a subsequent complaint.

Under these circumstances the Wiesbaden water has to prove its efficacy at one time in pneumonic affections, more or less active, and at another in ordinary chronic consumption.

In *chronic consumption*, the accompanying catarrh of the bronchial tubes and of the pulmonary cavities is, as a rule, the predominant symptom of the disease. The Wiesbaden water limits this secretion and thereby arrests the tendency to cough. Should the removal of the articular affection or of the neuralgia be possible and should recovery take place, the symptoms on the part of the chest also frequently disappear. Nevertheless the old changes of the air-cells are not entirely repaired. Latent for the moment, they do not endanger life, and the patient must live appropriately to his condition. As a weak frame of body, whether congenital or acquired, in many cases forms the groundwork, the limiting of the frequency of this kind of consumption is restricted to hygienic measures.

There is a better prospect for the cure of *subacute pneumonia* if some irritation still exist. Proliferation of cells and transudation, as well as transformation and absorption of the exuded matter, still go on. This form is especially apt to remain after inflammation of the lungs in adults. A scrophulous habit and a bony but lax bodily frame when inflammation arises, promote considerable deposits and lead to

more serious and lasting feverish excitement. Therefore relatively more women than men are subject to this disease. In old age, too, the inflammatory condition readily assumes this character.

If the disease be not too acute, the Wiesbaden water taken internally is not prejudicial nor are the baths when taken for articular rheumatism productive of evil. Previous spitting of blood forms no contra-indication. Expectoration, coughing, as well as irritation of the chest, generally diminish rapidly, and very much surpass the improvement manifested in the articular disease. The chest symptoms often disappear long before the hands and feet become thoroughly useful.

In women the menstrual periods do not exercise so pernicious an influence in this form of consumption, as in consumption essentially chronic; a reaction however occurs and requires consideration. In chronic consumption the plan of treatment must always take notice of the catamenia. When LISFRANC, ARAN, COURTY disapprove any treatment, their caution is well founded in advanced cases of pulmonary disease, accompanied by considerable irritation, and under such circumstances even the simultaneous treatment of pulmonary and genital disorders, according to MALET, is objectionable; nevertheless the cure of consumption is frequently prevented by neglecting genital disturbances.

Concerning the origin and nature of consumption see:
„Wiesbaden als klimatischen Kurort und Winteraufenthalt.“

Asthma.

In summer, patients troubled with asthma seek relief at Wiesbaden only for neuralgic pains, and after many unsuccessful trials at other thermal springs. They are seldom attracted hither from the experience that to persons afflicted with nervous asthma, residence in winter is more beneficial than in a softer and more southern air.

Asthma, differing from mere dispnoea dependent upon deficient lung capacity, is always, even when preceded by chronic bronchial catarrh and changes in the substance of

the lungs; a nervous affection, the nature of which is not yet clear, and it is consequently difficult to cure. If in women the development of the nervous impulse arises from some genital disorder, a course of the Wiesbaden water, both external and internal, has proved favourable, and has diminished the intensity and frequency of the attacks.

In all diseases of the chest the internal use of the waters is of the greatest importance; though, as appears from the foregoing, bathing does not inflict the injury that has been supposed, especially in consumption, and ought not, a priori, to be rejected.

DISEASES OF THE HEART.

Affections of the heart with acute rheumatism are rare, because the debilitating treatment formerly employed has been abandoned, and with it has ceased the danger of still further augmenting any already existing cardiac irritability, which indeed directly predisposes that organ to disease; hence we find at Wiesbaden proportionately few rheumatic patients with remains of a former attack of carditis. Besides such patients, only one case of heart-disease hitherto after measles has been observed; according to WUNDERLICH these cutaneous eruptions frequently exercise a deleterious influence.

In heart affections one is generally warned against bathing; and with reference to remains of preceding carditis very wrongly so. On the contrary an early use of the baths, before the deposit on the valves and in the pericardium has been organized, promises satisfactory results. The extent of the changes alone fixes a limit to the effect of the mineral water; old lesions being of course beyond its curative power. As the sounds of the heart become smoother during the treatment, as they more and more lose their rough character, and as the excitability also diminishes, there appears to be a possibility of a real transformation of the cardiac deposits. On account of the menacing aspect of such diseases a long course of treatment must be adopted in order to eliminate the deposits, as well cardiac as articular, and to insure complete re-establishment.

Angina pectoris.

Lately this disease has been observed in old men, sometimes accompanied by neuralgic pains, nervous disorders of the stomach, and affections of the abdominal organs. The experience that its attacks have been modified during treatment by the Wiesbaden water has proved a great boon to the patients.

Angina pectoris even in a slight form, produces a very depressing effect. A sense of stricture in the region of the heart, so acute as to threaten immediate destruction, accompanied with pains extending down the arms or with a loss of sensibility in the left arm, irregularity in the circulation, all these symptoms together are as disagreeable as they are unexpected.

A fatty condition of the heart and probably of the liver was on the point of being developed in the patients, yet without the characteristic disease having attained a high degree of intensity.

Combined with a proper mode of living and attention to the threatened retrogressive metamorphosis, the use of the Wiesbaden waters, both drinking and bathing, has exercised the most favourable influence upon the digestive and abdominal functions, and also upon the general condition and depressed state of the patient; and moreover, which is the principal thing, the attacks have ceased.

DISEASES OF THE URINARY ORGANS.

The difficulty of healing these diseases, at least those of the kidneys, is well known. Their dangerous nature is founded upon the delicate texture and unceasing activity of these organs, which are thus exposed to many injurious influences. Besides they may advance to a grave stage without having been observed.

Here also either articular rheumatism or neuralgia gives occasion to the patients afflicted with such evils to visit Wiesbaden, for the presence of renal disease being unknown

to them. But the improvement of the latter is by no means the least advantage obtained, if the articular disorders, &c., derive benefit from the waters.

Diseases of the kidneys.

The origin of the cases observed was often traceable to scarlet fever, which has been succeeded by articular rheumatism. More frequently chronic renal inflammation had originated in transmission of inflammatory or catarrhal affections of the urinary passages and bladder, in direct irritation, in the effect of various drugs (as balsamics), or in the abuse of strong drinks. In men, venereal excesses, in consequence of the close connection existing between the genital and urinary organs by means of the nervous system, may have exercised a predisposing influence. This probably suggests the frequent occurrence of deposits of oxalate of lime, which are often observed in those afflicted with nervous debility. Occasioned by more mechanical means, inflammation of the kidneys in women had occurred after pregnancy. The beginning of many diseases may perhaps be sought in maladies of childhood, in which rickety and feebly developed children often suffer from slight renal catarrh, that, during scarlet fever, is especially apt to lead to acute inflammatory renal affection.

Dysuria, especially in the night, almost always exists, because the urine contains foreign substances. Small quantities of blood or of albumen always irritate the bladder, which certainly reacts upon its normal contents; a fluid by no means mild, only in proportion to its quantity. Notwithstanding the dysuria, the bladder is not the seat of the original evil.

Chronic renal catarrh.

A small quantity of blood may be accompanied by only traces of albumen, so that chemical analysis may mislead. But even the blood globules themselves are, in acid urine, smaller and more sharply defined than we may expect to find them. At this stage of the disease the urine contains no

casts, but only renal epithelial cells, and in the light cloudy eneorema many crystals of oxalate of lime.

Chronic renal inflammation.

At the commencement one chiefly finds wide granular and epithelial casts, but later they are narrower and hyaline. Their number varies much as does the amount of deposit in the urine which always remains clear. The principal part of this deposit besides is formed of pus cells. Without secondary irritation of the bladder, the urine contains but little mucus. On the contrary, the quantity of albumen, as a rule, is considerable, just the opposite of what occurs in diseases of the bladder. Should the casts for the most part be hyaline and narrow, when they may be very sparingly present, one only sees isolated blood globules or they are entirely wanting. The urine is then but slightly coloured, contains no uric acid, nor oxalate of lime, but is heavily charged with albumen. The constitution of the urine betrays the high degree of granular degeneration of the kidneys, the extensive loss of excretory apparatus, and the deleterious effect on the whole organism.

When the disease has progressed so far, there can be no chance of real improvement. During renal catarrh one may, on the contrary, count upon the entire disappearance of the blood globules and of the traces of albumen. Isolated remaining pus cells and renal epithelium do not then exceed the quantity that may be met with in many adults who are relatively healthy. The deposit is now reduced to a thin layer.

Cases of more advanced disease with numerous granular and epithelial casts, with much albumen, and a variable quantity of blood globules, experience a decided improvement if the patient's habits be regular. But in the scanty deposit from the urine, which has at length become natural, even after a six weeks' application, microscopical and chemical evidences of disease are still to be found, although the convalescence and appearance of the patient may already seem to guarantee recovery. Mucus cells, granular and hyaline

casts, as well as albumen, are not entirely absent, even in cases in which the disease formerly presented only epithelial casts.

In all forms of the disease, the dysuria diminishes during a few days. Under the microscope we observe that first of all the blood globules disappear, then the casts and last of all the pus cells. (Concerning the chemical changes of the urine, see p. 30.)

A long course of Wiesbaden waters is just as important as is an accurate observance of all medical directions, otherwise relapses are inevitable. During the progress of the treatment, success becomes more apparent. The danger to be apprehended from the disease naturally necessitates an early use of the waters.

Diseases of the pelvis of the kidney.

Chronic inflammation of this part (pyelitis chronica) seldom occurs without disease of the kidneys themselves, and presents similar appearances; viz: acid urine, small amount of albumen, but numerous pus cells, few or no blood globules, and sometimes the peculiar epithelial cells of the renal pelvis.

In this disorder the Wiesbaden water has an effect similar to that which it produces in renal affections. The last traces of suppuration disappear just as late as in these cases, for the curative process encounters the same difficulties.

Diseases of the bladder

Irritation of the bladder in consequence of renal disease seldom oversteps moderate limits, as we have previously stated. Is the affection a primitive one it may be traced to irritation of the mucous membrane of the urethra; and the most obstinate and most frequent affections in old age owe their origin to disordered sanguineous circulation.

An abundant formation of mucus and pus is characteristic of diseases of the bladder. The muddy urine after throwing down a considerable thick and whitish deposit, does not

clear. The acid reaction afterwards changes into neutral and alkaline. We have before spoken of the albumen.

The idiopathic form of vesicular diseases resists the effect of the Wiesbaden waters. In old standing cases it is even injurious, in so far as the patient's strength does not directly increase.

Condition of the urine during exhibition of the Wiesbaden water.

The transition of chloride of sodium (common salt) into the urine during internal use of the water does not produce any more abundant flow of urine than can be accounted for by the imbibition of a quantity of fluid larger than ordinary; the exhibition rather limits the quantity.

The high colour, which is so often seen in consequence of local disorder, quickly gives place to the natural one. On the contrary, the pale, greenish-yellow colour, that is observed in anæmic patients, in many aged persons, and in those suffering from severe renal disease, does not undergo any change.

Even from the use of a small quantity of water the deposits of urate of soda soon disappear, for instance in catarrh of the stomach, in affections of the spleen and of the kidneys, and indeed wheresoever any irritation exists. Yet, this says nothing for the diminution of the uric acid itself. According to the physiological experiments of BRAUN, NEUBAUER, and GENTH, and the researches of BRAUN and NEUBAUER amongst patients (most of whom were probably suffering from rheumatism) the uric acid, chiefly resulting from transformation of the blood (MEISSNER) experiences an increase at one time slight, at another time considerable, under the internal use of the Wiesbaden water.

The deficiency of uric acid, which we have mentioned as occurring in the urine of anæmic patients, is never replaced. The quantity of oxalate of lime contained in the urine also appears to remain unchanged.

The above named investigators always found urea increased and indeed more largely than uric acid, both in healthy and in diseased subjects.

DISEASES OF WOMEN.

This class of maladies, as far as mineral waters can be advantageously employed in curing them, is hitherto but rarely met with at Wiesbaden during the summer. Dogmatic views are with difficulty overcome and still prevail in any branch of science, long after advanced and rational teaching has overthrown the old theory which none could now attempt to justify. In female disorders it is thought necessary that the mineral waters employed should contain iodine and bromine, but none have remarked that the chloride of sodium contained in the Wiesbaden waters, even by itself, evidently removes similar, not to say more serious lesions in other maladies. This salt, on account of its preponderance in saline waters, is the very curative agent in all diseases. *Wiesbaden* containing about the same quantity of it as *Heilbrunn*, but being a little weaker than *Kreuznach*, produces just the same beneficial effects.

The development of these female disorders is connected either with the period of puberty or with the child-bed (SEIFERT). In puberty ignorance of the importance of the normal evolution of the organs concerned often causes neglect of rational life. Even the time immediately preceding is not considered with the attention it deserves; chills and excitement during the menstrual period not avoided. In child-bed, many popular customs are often injurious. Continual lying on the back and pressure on the abdomen tend to produce an abnormal position of the uterus; too warm bed coverings, a high temperature of the room, the use of purgatives, all contribute to bring about a interruptions of the normal course of lying-in, and to occasion prolonged irritation in the matrix. Disturbances of this organ whilst recovering its former size give rise to lingering inflammation and catarrh with their immediate consequences, and originate a whole army of adverse symptoms.

Abnormal development during puberty.

Should the child's body during the various phases of its evolution not have reached the normal standard, it never-

theless usually succeeds at the period of puberty in recovering lost ground and in attaining healthy development. Saline waters and especially the soothing Wiesbaden water, administered with caution and perseverance, form here an important auxiliary.

If bodily development be very retarded, a state characterized by slow growth, slight limbs, weakness, an earthy-coloured withered skin, bad digestion, and great craving for sleep, the menses may not appear, or having appeared, quickly vanish. A process accompanied by various morbid symptoms. Again, the catamenial discharge indeed commences, but in an irregular manner, for it may be scanty, or on the contrary profuse, and then return too frequently.

Under the influence of the Wiesbaden waters digestion and nutrition first improve, and if the body in a few weeks again recovers its lost strength, even development makes a fresh start. The girl grows, her stature becomes more developed, her features lose their undecided, childish stamp, and the menses at last get regular. This restoration of the catamenia establishes itself without any violent appearances and quite unremarked.

A long course of treatment is absolutely necessary, hence it must be limited in time to drinking, nevertheless the baths greatly aid by cleansing the skin and calming the nervous system.

Diseases of women arising from unfavourable confinements.

A treatment undertaken at the proper time would prevent many injurious consequences; domestic circumstances, however, often present themselves as impediments. If imperfect recovery points to existing disturbance, a local examination will most quickly afford certainty on this point.

The result of the Wiesbaden waters when early applied, has hitherto proved most favourable. The chronic inflammatory irritation, and swelling of the uterus and particularly any casual suppuration are immediately lessened; the enlargement of the organ and the accompanying pelvic exudations are perceptibly reduced.

Should the commencement of the disorder date far back, success is not so complete, but nevertheless in many cases the return of the enlarged uterus to its natural size takes place, as long as a certain amount of irritation may prevail. Here one cannot dispense with local treatment to destroy the great sensibility arising from inflammatory irritation, to limit the cicatrization of ulcers at the neck of the uterus, and to arrest the intra-uterine catarrh. Local treatment and the use of the waters, insure more speedy success than if the former had been employed alone. In a shorter time at least the wounds close than when simple hip-baths &c. are used alone, and the enlargement of the uterus subsides, whilst it yields but slowly to ordinary treatment.

Influence of the waters upon menstruation.

After the manner of warm baths the Wiesbaden waters generally accelerate the catamenia. If the premonitory symptoms are watched the discharge may commence four days sooner. In certain cases when great irritation of the organs is present, it advances even by ten days. The quantity of blood on the contrary slightly diminishes; but it increases under the above conditions and more usually so during climacteric years if any tendency to hemorrhage exists. After having ceased for some months the menstrual flux not infrequently reappears at this time of life. Unpleasant disturbances are almost inevitable.

According to my own experience pregnancy forms no counter-indication for the application of the waters. MÜLLER has observed premature confinement and abortus; but gives no details of the cases. Probably, as not rarely happens, the patients had used the waters without having consulted a medical man. Ordinary precautionary measures as a matter of course must not be neglected during the earlier months.

In some cases which came under my own observation internal use of the waters produced no effect on the *lacteal secretions*: the infants flourished.

CUTANEOUS DISEASES AND AFFECTIONS OF THE
SUBCUTANEOUS CELLULAR TISSUE.

In former times whilst many of these disorders were attributed to herpetic diathesis or to a vitiated sanguineous condition, and a treatment was adopted whose object was to purify the blood by energetic purgative and sudorific remedies; recourse was generally had to saline sources. The amelioration of obstinate eczema — humid tetter — was chiefly anticipated. The hopes entertained were not likely to be fulfilled; as to the immediate result of such treatment. Powerful saline baths whose causticity was often augmented by the addition of mother-ley (*mutter-lauge*), could not but aggravate the eruption by increasing cutaneous irritation, whilst on the other hand, the body was enfeebled by exhibiting internally doses so large as to produce energetic evacuations; yet more in cases of children. How should nature establish an equilibrium when opposed by art?

The unfounded hypothesis, never tenable, that cutaneous eruptions arose from vitiated blood was rejected on HEBRA'S authority, and upon the same authority men believed that saline waters were positively pernicious. This latter opinion was fully concurred in by the astute and experienced Dr. BRAUN of Rehme. It must certainly be admitted that such affections are often merely local and that treatment, purely local, ameliorates though it does not guarantee from relapse (v. NIEMEYER). The old theory is nevertheless not essentially devoid of truth: the beneficial influence of saline waters does not lie in their direct action on the surface; but in their result upon the organisation whereby the cutaneous disease is modified.

The larger number of patients seeking alleviation here are those afflicted with so-called scrofulous eruptions. They are based upon a special condition of the body and of the skin, which is flaccid, relaxed and sensitive to morbid influences. The constitution of the blood is impoverished; it is watery, poor in saline constituents, induced by frequent and profuse secretions as: perspirations, obstinate diarrhœa,

&c. The blood has beyond all question undergone quantitative modifications; though it is impossible to prove the presence of specific virus. If the skin is exposed to any irritating influence as: tears in inflammation of the eyes; discharge from the nose; the saliva in diseases of the mouth, or to a mechanical cause as the sun's heat, excessive inflammatory irritation of the cutaneous tissues will ensue; as, under analogous excitements, in the internal organs. The abundant exudation from the impoverished blood which follows induces considerable swellings of the elementary tissues, and the entire region affected tumefies. In persons of healthy constitution such eruptions and glandular swellings would have been insignificant under like circumstances.

The chief object against which a rational treatment should be directed in so-called scrofulous affections is the amelioration of the constitution and the improvement of general health. In childhood therefore, they are often overcome, as development vigorously advances, as in riper years their cure will only succeed when health is completely reestablished — and health alone will ensure from danger of relapse. It is now very plain, as experience shows, that the cure of eruptions and glandular swellings will never be accomplished by debilitating treatment.

There is no remedy which contributes more surely to the natural development of the body during the years of youth and puberty than does a rational use of Wiesbaden water. During application the eruptions may diminish; more completely, to be sure, they disappear as growth proceeds and pursues a normal course. If a first exhibition has not accomplished the cure a second one must be undertaken.

Notwithstanding the adverse opinion of some high medical authorities saline waters continue to be indicated in chronic eczema. Although excessive cutaneous irritation may temporarily forbid their exhibition, in inveterate cases of a torpid nature where thickening and degeneration of the skin is present, they render valuable services. Their favourable action is certainly most plainly manifested during the years of development.

A peculiar form of eczéma, *hemorrhoidal pruritis*, frequently demands treatment in Wiesbaden. We have already stated that it originates in catarrh of the rectum when the irritation extends to the cutaneous regions adjacent. The water taken internally exerts but little influence; the utility of the baths is reduced to a minimum. From local treatment more may be hoped and such must at any rate accompany the general course.

Again, the Wiesbaden water develops its curative properties *in all affections of the skin accompanied by exudation in the cellular tissue.*

Chronic inflammations of the cellular tissue of the lower part of the thigh, with or without ulcers of the skin, frequently come under notice here and are preceded by anomalous sanguineous circulation. Pressure exerted by abdominal tumours, displacements of the womb, particularly those succeeding child-birth, diseases of the liver, the results of severe typhus; further, employment necessitating long standing, debility arising from dissipation are the general causes inducing stagnation of the blood, or relaxation of the tissues productive of tension and obstruction of the vessels. Repeated cutaneous inflammations succeeded by infiltration — called false erysipelas — and now and again by suppuration, cause the limb affected to tumefy.

If in the course of treatment care is taken to maintain the sanguineous reflux in the diseased limb, and attention is paid to the inducing causes, the cure as a rule, progresses rapidly. To the action of the baths may be mainly ascribed the speedy cicatrisation of suppurating wounds, and the disappearance of the secondary eruptions. The size of the limb soon diminishes. Improved nutrition caused by internal and external use of water brings about permanent local and general amelioration.

Habitual erysipelas, chiefly of the face. — The frequent recurrence of this malady, like toothache, catarrh of the larynx, diseases of the female genital organs, &c., is probably connected with residue of the exudation in the parts formerly affected, whilst a lymphatic constitution, with a

delicate and transparent skin, generally hereditary, renders the patients susceptible to injuries.

With regard to the occasional cause erysipelas usually arises from toothache, coryza acute or chronic, inflammation of the eyelids and of the ears, and various cutaneous eruptions of the face.

As promoting the absorption of the exudation deposited in the cellular tissue by the preceding erysipelas a course of Wiesbaden water is still an excellent prophylactic remedy. The amendment of the constitution, which takes place, contributes moreover to the favourable results obtained, for the flaccidity of the flesh and the puffy appearance of the skin, particularly of the face, disappear.

Habitual nettle-rash may just as readily be cured and subsequent attacks prevented. This affection being usually accompanied by disturbances in the digestive functions, it may be assumed that the action of the water on digestion produces the beneficial effect.

The difficulty of healing *pemphigus chronicus* will justify reference to an extraordinary instance which came under my own observation. The entire surface of the body was covered with large blisters and excoriations, and the cellular tissue much infiltrated. The malady had resisted all methods of treatment for four months. The Wiesbaden waters completely cured the patient within a comparatively short period.

During the first ten days of the course a few new blisters appeared. Soon the skin began to dry and the dressings hitherto applied were dispensed with. A five week's application sufficed to restore even the external appearance of the patient who had grown exceedingly thin. He now enjoys excellent health since eleven years.

Furuncles. — Finally the tendency to furuncle is most beneficially modified by the waters of Wiesbaden.

It is exclusively patients of enfeebled constitution who are troubled by furunculous eruptions. A slight irritation then suffices to produce, in certain glands of the skin, inflammation followed by profuse infiltration and by suppuration.

Any remains of former deposits are absorbed during the

exhibition. Improved nutrition and restored constitution forbid the recurrence of the furuncles. A course of treatment tending to promote excessive evacuation would be injurious on account of its debilitating effects.

In all cutaneous diseases baths are absolutely indispensable; the internal use of the water must however not be neglected if exudations are present, nor when it is necessary to ameliorate disturbed digestive functions.

Eruptions induced by the waters.

The very moderate quantity of saline components held in solution by the mineral springs is not likely to occasion considerable cutaneous irritation, the more as the temperature of the baths is low and their duration limited. Hence rarely do eruptions make their appearance. In the cases when it has happened slight affections already existed or were produced by irrational treatment, either the temperature was too high, and the bath too long, or the skin had been irritated by brushing and friction, or the patients, in ignorance, had intentionally kept themselves too warm.

Such eruptions are not at all favourable to the action of the waters. Although they soon disappear if bathing is suspended; the itching interferes with the night's rest and often interrupts the course; so that the patient should avoid its provocation by all possible means. The appearance of new eruptions always indicates great cutaneous irritability.

In entering upon the discussion of cutaneous diseases we invaded the province of exudations and tumefactions in the external region of the organism and are thus led to consider the various affections of the glands, bones and joints, chronic rheumatism and gout. A vast field is thus thrown open to the salutary influence of the Wiesbaden waters; for all are combined with remains of inflammatory infiltrations, with deposits and with tumours. The interest of the investigation increases as the transformations produced by the mineral water admit of more direct observation.

DISEASES OF THE GLANDS.

Swellings of the lymphatic glands of the neck are the consequences of inflammatory irritation in the adjacent parts, of eruptions on the head and face, of diseases of the ear or eye, affections of the gums or throat, as lymphatic vessels of all these parts communicate with the glands of the neck. To VELPEAU appertains the merit of having started this theory, the correct one. If the glands have once undergone a change, a chill may aggravate their condition. A cold, however, will not produce inflammatory swelling in the first instance.

In so-called scrofulous subjects (see Diseases of the skin) the primary affections are usually manifested in the head and face, and it is in such patients that, on account of the liquidity of blood and diminution of saline constituents, the swelling and change in the glands attain the highest degree of development. Debilitating influences of the simplest nature, confinement for instance, may produce on other occasions the same results as does such an abnormal sanguineous constitution; they often induce an intensity rarely observed. In treating affections of the glands, it is therefore necessary, as in the treatment of cutaneous disease, to bring about local absorption, to ameliorate the blood and to restore the bodily condition; but not to eliminate from the organism any specific matter.

The origin of *knotty swellings in the female mammary glands* differs in no way from that causing swellings of the lymphatic glands. During suckling, as is well known, purulent matter originating in slight sores of the nipple leads to inflammation in certain secretory ducts.

It may not be without interest to follow the changes undergone by glandular swellings during a course of Wiesbaden water. Observations made at various phases of their development have taught that pronounced inflammatory irritations withstand the effect of the mineral waters; on the other side, a moderate degree of irritation is favourable to their action, whilst indolent, long standing cicatrised tumours remain unchanged.

After the subsidence of the inflammatory irritation which has passed off with or without abscesses, the suppuration if still existing, first dies up. The fistulous ducts close. A glandular swelling without suppuration yields, however, more rapidly to the retrogressive metamorphosis effected by the water. This metamorphosis unquestionably manifests itself first in the intermediate substance which had united into a single mass the various isolated but adjacent glands, under the normally healthy condition not distinguishable to the touch. This mass resolves itself into different oblong tumours whose size gradually diminishes until at length they can no longer be felt.

When the swollen glands have reassumed their normal dimensions there is no danger of relapse, whilst so long as the smallest particle of exuded matter remains a chill suffices to cause renewed tumefaction.

During the days of youth which furnish the largest contingent of patients, the course has a second object to fulfil, namely to stimulate the retarded physical development; for the reestablishment cannot be declared complete unless this latter result has been arrived at.

The most favourable time for women to take an internal course of the waters for the amelioration of swellings of the mammary glands are the weeks immediately succeeding the disappearance of the inflammation, though the exhibition then is usually only practicable when the mineral water is sent to the patients' home. Subsequently a course should under no circumstances be neglected as a provision against danger of analogous inflammation which may recur at future confinements. If the swellings once become indurated there is, principally in old age, risk of degeneration.

The conventional three week's course suffices to reduce slight glandular swelling; but the majority of cases require a longer sojourn; the more if defective physical development has to be considered. A repetition of the application under these circumstances is not unfrequently necessary.

Although the internal use of the water is the main thing, the baths rationally exhibited prove powerful auxiliaries.

DISEASES OF THE BONES AND JOINTS.

We shall only treat here of *simple* chronic diseases of the bones and joints, not of gouty and rheumatic affections.

Many patients come to Wiesbaden suffering from *the effects of fractures and dislocations*. In fractures excessive callus formation and persistent irritation in the fractured parts form the objects for treatment. Frequently the secondary affection of the neighbouring joints, the result of prolonged rest, known as *anchylosis of inaction* (VOLKMANN), is troublesome to the patient. On account of its tendency to become anchylosis proper it is advisable to commence the course as speedily as possibly. Precisely so after dislocation does the elimination of the deposits produced by inflammation in the affected joints require assistance.

The late war brought us a large number of patients with *wounds at the cicatrisation stage*. The renown acquired in the earlier part of the century by Wiesbaden waters as being a specially efficacious remedy for gun-shot wounds has unfortunately been verified of late. Simple cutaneous wounds were less numerous, especially those in which the corresponding bony parts were contused, fractured or otherwise injured. The principal object to be attained was to dry up obstinate suppuration, to absorb considerable effusion existing about the sources of inflammation and to check chronic periostitis.

Although in peaceful times such cases seldom occur, each summer nevertheless affords us opportunities of observing *chronic inflammation of the periostium, of the articulations, of the spongy parts of the bone with or without suppuration* (caries). True, the supposition that the patient is suffering from some rheumatic affection is frequently the cause of his being sent hither. Although the simple fact of the existence of chronic inflammation should suffice to determine the nature of the malady, whatever the individual opinion may be; saline waters are under all conditions the most potent remedies.

The organs attacked — so far as the diaphyses are in question — are more especially the tibia and the radius, and

as a rule the disease has reached the stage of decided caries : as far as the joints are concerned it is usually the knee and the hip ; the hand suffers less frequently. In the form of tumor albus, white swelling, in inflammation of the knee, the joint itself is not so often attacked as are the soft parts surrounding it (VOLKMANN) ; then the process is sometimes advanced to caries and accompanied with fistulous conducts.

Besides these forms, cases of tubercular degeneration of the epiphysis of the knee accompanied by pulmonary consumption come under treatment ; as also inflammation of the knee complicated with renal disease.

The origin of the affection, in so far as it is known at all, is explained by its name, and though such cases are conventionally called scrofulous, we have set forth our ideas in that section treating of cutaneous and glandular disorders. In enfeebled constitutions the inflammatory process — and this is the chief point of consideration here — readily exceeds its usual limits and results in excessive growth of nodules and in proliferation of imperfect cells ; in suppuration and adipose degeneration, &c. There is little doubt that even in perfectly healthy subjects the exudation may become profuse through deleterious local influences, as for instance, splintered bones.

Decided inflammation conveys the warning that it is necessary in these diseases more than elsewhere to exercise caution in exhibiting the Wiesbaden waters, as on account of the structure of the articulations, the slightest augmentation of the swelling may produce the most acute pain.

If diseases of the bones and joints are accompanied by suppuration and fistulous ducts, to the baths may be attributed the chief healing virtue. The water exerts a direct curative influence on the wounded surface ; it not only cleanses it ; but changes the nature of the secretion, which loses the ichorous, bloody character and becomes what is called healthy. If no local obstacle, such as a fragment of bone, demanding removal, exists, the suppuration diminishes with marvellous rapidity and the wound cicatrises. The thickening of the bones and joints still remaining after sup-

puration has ceased, requires a longer time to subdue and the work of renovation advances more slowly. Although the bath now promotes the cure, to the internal use of the water must be ascribed the chief influence; for that alone would produce the effect — though more rapidly when combined with the baths.

Experience has shewn that simple affections of the knee-joints may be thus ameliorated in a few weeks. Inflammation and suppuration of the tarsus require a longer course; most obstinate and difficult to overcome are affections of the diaphyses.

A course of Wiesbaden water is particularly to be recommended for children suffering from diseases of the bones or joints; such a course exerts no exhausting influence; calls forth no unpleasant disturbances and normal development subsequently advances favourably.

On the contrary, if suppuration of the joints supervene — in young women — during the years of puberty, the complication appears to exercise a pernicious influence; the local disease is always accompanied by great irritation. The appearance of the menstrual flux in acute disease likewise exerts no soothing effect; but rather causes the manifestation of unfavourable symptoms.

The success attending a course of treatment in cases of fractures or dislocations depends very much upon the state of the injured part and upon the secondary changes in the adjacent joints. The first point to be decided is: Is the fracture or dislocation healed, either perfectly, or with some malformation? In the latter case things sometimes right themselves in an extraordinary manner, as may be seen in fractures of the metacarpal bones often so difficult to heal.

Excessive callus formations disappear under the exhibition of the waters if taken soon after the consolidation of the fracture. It has never been remarked that the mineral water exercises any hurtful effect upon the ossifying of the fracture.

As far as the amelioration or cure of the secondary affections of the neighbouring articulations — resulting from prolonged immovability — are concerned, it is a mere ques-

tion of time. Even very pronounced inflexibility if it has not degenerated into positive ankylosis generally gives way within a fortnight or three weeks. The result of the treatment alone can prove whether the ankylosis is curable or not. Gymnastic exercises may materially promote the effect.

Pulmonary consumption and kidney affection accompanying any simple articular disease constitute no counter-indication for the exhibition of the Wiesbaden water. The case is however different when tubercular disorder of the joints is complicated with acute tuberculosis of the lungs. All hope is vain here. Frequently besides we have to fight with obstinate diarrhœa in such cases.

The retardation of the vital phenomena in the solid tissue of the bones and in the firm joints does not permit of rapid modifications in these parts. Hence the duration of the course is much prolonged in comparison with that required in affections of other organs of a different structure. Simple diseases of the soft parts of the joints or slight morbid processes of the latter will submit to a few weeks course of the thermal spring.

CHRONIC RHEUMATISM.

Chronic rheumatism and Wiesbaden water have become in the process of time, inseparable ideas in the minds of both doctors and laymen. This conviction, as we have already remarked, has caused patients suffering not from rheumatism alone; but from any painful disease whose symptoms resemble those of rheumatic affections to be sent to us. Chronic rheumatism and neuralgia hence furnish us with the majority of cases during the summer months.

Causes. — Setting out with the idea that cutaneous transpiration suppressed by cold causes rheumatism, the logical conclusion arrived at was that articular disease was based upon abnormal sanguineous constitution. Now in many and grave cases, the disease is produced by a very slight chill, and even if the transpiration be suddenly checked, this lasts but for an instant (it is impossible that the moisture on the

surface of the body can be driven back), and in the next one normal action is restored. Besides, the kidneys eliminate a comparatively larger quantity of like matter, and continue to do so during the momentary interruption. Perspirations, too, even the most profuse, as is well known, are inefficient in the majority of diseases produced by a chill, if they be of a severe character. The local affection essentially inflammatory, which has developed itself and which constitutes the definite rheumatic disease must always run its course as organic nature requires.

The theory of cutaneous transpiration suddenly arrested being the cause of rheumatism was formerly carried to extremes. Possibly the presence of an acid smell originally induced the search for some organic acid. Without waiting to reply to the question: is acid perspiration peculiar to rheumatic patients, and overlooking the fact that the intensity, even the nature of the disagreeable odour is in direct proportion to the hygienic condition of the skin; SIMON pretended to have found a considerable quantity of acetic acid in the perspiration of rheumatic patients. According to SCHOTTIN neither the abovenamed, nor other allied acids, are absent from the perspiration of perfectly healthy persons.

Older still is the hypothesis, advanced by PROUT, that lactic acid is present in the organism of persons afflicted with rheumatism. All experiments undertaken to prove this opinion have hitherto failed. The synovia, as also the saliva of rheumatic subjects, shews only exceptionally, a slight acid reaction; both one and the other are alkaline, as in healthy condition (CHARCOT). DAVIES in treating rheumatism upon his blister-system found the serum of the blood alkaline and free from lactic acid; H. DAY confirms this assertion. MÖLLER and RAUCH in the conclusive experiments they instituted, never succeeded in provoking any local affection resembling rheumatism by the application of lactic acid. This fact annuls the contrary assertions made by RICHARDSON. INMAN on the like grounds denies the formation of lactic acid in rheumatism.

This hypothesis, so long caressed, of specific rheumatic

dyscrasia, whence arise the local affections, and by which the transition of the rheumatism from joint to joint might the better be explained — this hypothesis we see cannot maintain its ground and it becomes necessary to search elsewhere for an explanation of the pathological symptoms. Happily an easier solution may be found, one perfectly in harmony with all the phenomena and one betokening no ill to the patient.

The abnormal articular changes in rheumatism differ in no way from those in inflammation of the joints produced by mechanical agency. Articular affections succeeding the prolonged inaction consequent upon a fracture are already distinguished from articular rheumatism in the local lesion; still more do scrofulous inflammations, or those connected with syphilis, leaving gouty inflammations aside, differ from them. CHARCOT called special attention to this circumstance. That rheumatism consists in ordinary inflammatory irritation of the joints has of late been plainly shewn by OLLIVIER and RANVIER whose microscopic researches instituted in recent cases are beyond all question accurate.

The anatomical structure of the joints and the dependent functions alone communicate to the articular inflammation a peculiar character as far as the former distinguish themselves from those of other organs. Hence the exudation, produced by the irritation, corresponds to the watery constitution of the synovia, and is of the same nature but larger in quantity. Thus only exceptionally does suppuration ensue as in parenchymatous inflammations in which the cellular tissue participates. The contents of the accessory organs of the joints, of the adjacent serous bursæ, when they are inflamed, resemble likewise their normal state.

In ordinary cases this secretion does not exceed certain limits, though under special circumstances it becomes excessive in the joints and bursæ mucosæ. Marked irritation, frequent attacks of one joint, retarded recovery, greater bodily exhaustion, decided nervous debility most frequently give rise to such an unusual secretion.

A watery exudation, small in quantity, can as a matter of course be most readily overcome. Even if it is conside-

rable, after the fluid portion is absorbed, the transformation of the slight residue, that is to say its liquefaction by a fatty decomposition and its absorption offer no serious difficulty. It is at least plain from these facts that variations in the symptoms and changes in the affected articulations may easily take place.

In rheumatic affections a chill is usually the provoking cause — a cause productive besides of many other diseases. Hence rheumatism is by no means *the specific malady produced by cold*. This fact proves sufficiently that cold itself does not generate the local lesion, scarcely indeed can an excessive chill occasion limited inflammatory irritation. Rather must certain portions of the body already have in themselves a tendency, must so to speak: be diseased, the more as a slight change of temperature will often induce obstinate rheumatism.

Observation has shewn that in the following morbid conditions exists the tendency to rheumatic affections of the joints.

Joints already deformed are frequently the seat of rheumatism, as also is the inherent flat-foot, articular changes resulting from fractures or other causes. Thus the great toe in the course of time, suffers from badly made boots and shoes and undergoes a subluxation of the first joint. The chronic inflammation which in such cases develops itself, during the period of health, as the consequence of necessary motion (see Section on gout) may be aggravated by a chill and thus degenerated into rheumatic disease.

The joints most exposed to fatiguing influences are those most readily attacked. Constant use, continuous pressure may under these circumstances provoke chronic irritation which becomes the starting-point for future disease. With regard to the balls of the great toe reference was just made to disease produced in them by their frequent use. Heavy individuals who walk or stand much have a strong tendency to chronic inflammation of the great toe. We shall presently discuss their rheumatic character and the usual mistake made in treating them as gouty affections. If the fingers are in

constant use as is the case in all manual employments, in piano-playing and other female occupations, the joints of the fingers and hands are principally those attacked.

In the history of the origin of rheumatism there is another very significant circumstance often passed over in silence, namely: *morbid nervous influence*. The importance of this factor in the development of certain maladies, those for instance of the skin, is universally admitted. CHARCOT and, as his disciple, BALL, have lately described epiphenomena of special joints in connection with tabetic symptoms and cerebral disease as forming part of our subject. More remarkable still is the decided influence of an abnormal nervous system upon the development and character of the chronic articular inflammation in so-called arthritis deformans which is so closely allied, as far as local symptoms are in question, with rheumatism.

It is true that nervous affections as profound as those met with in these nosological groups are not in question in ordinary chronic articular rheumatism, nevertheless there are many cases in which the characteristic symptoms undoubtedly arise from disturbances in the innervation — in the sense of nervous debility. To a less considerable affection of the central organ, corresponds a less pronounced deformity of the joints. The disturbances in the nervous system then are usually caused by venereal excesses, as is shown by other concomitant phenomena. In discussing presently the symptoms we shall speak more of this point.

To this form of rheumatism is most properly ascribed, *gonorrhœal rheumatism*, to which I have assigned the same place in the second German edition (1862) of this work. The character of the disease is entirely similar. Where gonorrhœa is of frequent occurrence there certainly cannot be any want of enfeebling influences. The affection of the urinary organs, or their momentary irritation from certain medicines, exercises a pernicious influence upon the nervous system from reflex action alone.

Excluding all such cases there nevertheless always remains a considerable number of observations of articular

rheumatism, which, in reference to its development, admit of no other explanation than that *deficient nutrition or a weakened state of the constitution*, expressed by the condition of the whole body, has also occasioned corresponding troubles in the vital processes of the joints. The articulations, from their peculiar organization and constant action, are exposed to much greater irritation, than are any of the soft parts of the body. The inferior extremities and the hands, being so especially and actively used, are in consequence most frequently affected.

But the constitution may be just as much enfeebled by an irregular and imperfect development in youth, as at the time of the cessation of the catamenia, when the organism begins to decay. A similar disturbance of nutrition will be occasioned by difficult parturition, suckling, protracted uterine disorders complicated with nervous attacks, by excessive bodily and mental exertions, depressing emotions, and debilitating illnesses, such as chronic affections of the stomach and intestines, phthisis, renal diseases, &c. Under such circumstances the obstinacy of the evil is easily to be understood, because the constitution can only be re-invigorated by degrees.

The opinion, already alleged in former German editions of this treatise, that certain debilitating influences predispose the body to rheumatic affections is not without competent advocates. As GARROD explicitly declares, rheumatism especially occurs in persons „of enfeebled powers“ or, as he says in another place, „in the weak“. CHARCOT states that rheumatism attacks „those living in misery“ and particularly „enfeebled and reduced persons“.

The more simultaneously that injurious influences, such as impaired nutrition, nervous weakness, over-fatigue of certain members, act upon the body, so much the more easily is rheumatism developed.

If in one way or the other the joints have become less resistant and predisposed to unusual influences (*loci minoris resistentiæ*) or if in fact they be *already diseased in a slight degree*, a trifling circumstance will suffice to convert the

existing irritation into positive inflammation. In consequence of the predisposition in many joints, an accidental cause during the progress of the disease, such as exposure of a part of the body in the night, may augment the irritation in another joint than that first attacked. Here now the inflammation soon diminishes. Other maladies exhibit similar phenomena, and in order to account for the shifting pain in the joints, it is not necessary to resort to the hypothesis of a specific matter in the blood (virus), the transference of which moreover could not be so easy.

According to this explanation of the origin of rheumatism there can only be allotted to the *co-operation of cold* the place of an accidental cause, which gives the final impetus to the outbreak of the local disease. Experience at this watering place has proved that patients very seldom charge severe cold with provoking their sufferings. If CHARCOT met with it, it might be looked upon as the result of hospital practice, just as he regards the influence of a damp house as a cause of rheumatism, a circumstance seldom injurious at least to such patients as visit watering places.

In face of the transient influence of cold, neither the propagation of articular alterations nor the continuance of the whole disease, could formerly be regarded otherwise than as the effect of the oft-repeated hypothesis of a peculiar rheumatic condition of the blood, tho' all other disorders arising from cold, visibly owe their origin to local diseased seats that already exist. The alveoli being attacked in consequence of the presence of a carious tooth, often induce toothache under the influence of cold; the mucous membrane of the throat irritated by hawking, tobacco smoke, or by degeneration of the tonsils, predisposes to inflammation. Persons afflicted with nasal polypi are particularly subject to coryza. Inflammation of the lungs readily recurs in those who have previously suffered from it, and often arises in cases when chronic pneumonia (phthisis) exists and when patients frequently have had bronchial catarrh. Examples could be multiplied of that which science designates by the general name of „internal morbid causes“; under these circumstances traces of inflammation are not seldom to be found.

But how cold acts injuriously still remains an obscure point. In catarrhs, certainly, cold directly reaches the organs of respiration, but whether in these cases an intermediate agent be not necessary, which the cutaneous origin of rheumatism justifies us in supposing, is difficult to be determined. In rheumatism the nervous system may indeed be regarded as this intermediate agent, which transmits the impression of cold (for a single puff of cold air may easily lay the formation of serious injury), to the articulations already sensitive and somewhat diseased, and which augments the latent irritation into inflammation. In an inverse manner as a glass of cold water taken whilst the body is heated, forthwith produces an outbreak of perspiration through the medium of the nerves (for the passage of the water into the blood and to the skin in so short a time is not conceivable); so also in originating articular rheumatism the sensitive cutaneous nerves, affected by cold, give occasion to increased secretion in the articular cavity accustomed to an aqueous secretion and already in a morbid condition. From this moment begins that form of articular inflammation called rheumatism, and assumes a character and runs a course in conformity to individual constitutions.

Symptoms. — We will now proceed to examine more closely the more important points in the numerous cases of articular rheumatism that have come under our observation.

The division into rheumatism *affecting one joint or many* (mono-articular and poly-articular rheumatism) can only be applicable in a few special cases, and has no value in a practical point of view. If the attack at its commencement do not from local causes seize upon any particular member, the great toe for example, at the time of treatment, affections of other articulations, although transient, always preceded that of some special joint, or at least rheumatism of the nerves, lumbago, sciatica, general rheumatic pains. From special causes the inflammation had become fixed to some particular joint.

Inflammation of the great toe and podagra (gout) are by no means identical. Although the former may have existed

alone for years without any other articulation suffering, or may be one of many joints affected; yet gout proper is seldom in question. In agreement with what CHARCOT found, in almost all the cases of inflammation of the great toe that have been examined here, there was an absence in the blood of uric acid (but we will refer to this point hereafter). Would it not be in the highest degree astonishing, if the great toe, notwithstanding its marked predisposition, should remain free from rheumatic attacks? In process of time as the diagnosis of the two diseases became more definite and the great toe was known to be the favourite seat of gout, every affection of that member was taken for gout. But with what right? The error was essentially founded upon the idea that an attack of gout runs a cyclic course. Now such is the case with every isolated affection of the great toe under similar management and habits of the patient; the severity of the pain enforces rest and attention to diet, whilst the idea of gout being present restrains the physician from adopting energetic treatment, for example; from profuse sweatings.

The degree and extent of the changes, as well as *the number of articulations affected*, vary greatly in chronic rheumatism. Although at Wiesbaden the majority of cases that claim the physician's aid are obstinate and of old standing, nevertheless in ordinary rheumatism the number of joints attacked is mostly limited. The articulations of the feet, knees, hands, and those of certain fingers, are most frequently affected simultaneously. The elbows and shoulders seldom suffer at the same time, and yet more often does the hip joint escape unscathed. The vertebral column, the ribs, and the maxillary articulations, are chiefly attacked in so-called „arthritis deformans“ but not in simple rheumatism.

We will now examine what peculiarities are stamped upon articular rheumatism by certain causes. Under the *decided influence of nervous debility* articular rheumatism is generally of a vague character and attacks many joints, yet it almost always occurs in the knees and inferior extremities. Even the most obstinate instances come under observation, when

the rheumatism takes up its abode in the knees. A slow course, indeed from the very commencement of the disease and without violent inflammatory symptoms, characterizes such a case. Nervous pains, oftentimes lumbago, precede the outbreak of the rheumatism and generally accompany it as vague neuralgic pains.

As regards the pains, a remarkable indolence is often present, particularly in gonorrhœal rheumatism. However, other cases, evidently connected with weakness and irritability of the nerves, show on the contrary a very pronounced painfulness, which is in no proportion to the local change nor to the impaired sensibility of the affected part to direct pressure. For instance, the patient, when recumbent, feels nothing in the joint, which he, as well as the physician, may move without occasioning pain. Whilst standing, and especially whilst descending a flight of stairs, when the muscular action irritates the nerves, he suffers on the contrary most excruciatingly. The „irritable joints“ of the English belong to this category. These forms, again, thoroughly resemble gonorrhœal rheumatism in their obstinacy. After having been apparently cured, they easily return but sometimes they are absent for a long period. The pains will augment in consequence of sexual excess without any further cause. In short the prominence of nervous disorder is unmistakable throughout the course of this disease.

Should *general debilitating causes have produced disturbance in the nutrition of the body*, the most extensive and obstinate cases of articular affections are then met with. The absence of the characteristic changes which mark the so-called arthritis deformans, yet accurately distinguishes chronic rheumatism of the ordinary kind from that disease. If incurable deformities do not already exist, extensive disfigurements give a favourable prognosis, just the contrary being the case in arthritis deformans.

In this class it is only *articular affections under the influence of advanced renal disease*, that require mention on account of their special character. The approaching dropsy already declares itself by a diffuse swelling of the attacked

joint. If the patients do not keep their beds, the fingers and metacarpal joints swell. In arthritis deformans, on the contrary, the ends of the fingers become attenuated; in ordinary chronic rheumatism they remain unchanged.

Cases of thoroughly indolent chronic rheumatism without any tendency to a beneficial retrogressive process are of course to be expected at Wiesbaden. But it is most surprising that patients arrive not only with the remains of irritation, but even with a *considerable amount of febrile excitement*.

Many *affections of the knees*, more rarely those of the hands, are characterized by *crepitus* during motion of the limb. Degeneration in this kind of disorder may be but slight; where it is considerable the glutinous condition of the synovial fluid appears to arise from some peculiar modification, probably a morbid state, of the cartilages of the joint.

As a rule, the soft parts are also somewhat implicated in chronic articular rheumatism, the serous bursæ in particular suffer. The bursa most frequently affected is the one over the knee-cap, and it often attains an enormous size. The bursa situated beneath the patella remains much smaller. It is only exceptionally that a bursa in the popliteal space is thrown into an inflammatory state, in which case it may become the size of a hen's egg. The bursa at the posterior part of the foot in front of the external ankle bone is of secondary importance, and its condition is often without any reference to rheumatism. The serous bursæ of the back of the hand and of the elbow may suffer also, those of other articulations escaping observation.

Articular rheumatism sometimes consists solely in an affection of the soft parts, especially of the bursæ. In such cases, certain defined accidents, as pains, are not found in connection with the joint, for example, pressure. The puffy swelling of the bursæ generally interferes only with the movement of the limb, seldom do they become inflamed, nevertheless the swelling in the hollow of the knee is often very painful.

Result of the treatment at Wiesbaden. — The remains of

former inflammation ought not to escape attention. When increased heat of the skin accompanies considerable pain, and the night's rest is interrupted by febrile agitation, the baths are injurious, and a course of the water produces no beneficial effects. In this case as well as if during the application some accidental fever should have taken place, a continuation of the use of the water will prove but a loss of time.

The exhibition of the Wiesbaden water can be only rationally founded upon two maxims; viz: *the articular affection, and that peculiar constitutional condition which predisposes to rheumatism.* Without the last consideration there is danger of falling into the old idea of believing in a rheumatic dyscrasia and of wishing to obtain a successful result by severe treatment. Should thereby the desired result be frustrated, especially when from the origin of the rheumatic affection enfeebling influences are of a great account, the patient alone will be the loser. *It is only when the second principle is essentially looked upon as the ruling one for treatment, that errors can be avoided with certainty.*

Nervous weakness, menstrual disturbances, catarrh of the intestines, affections of the lungs, renal inflammation, &c., demand in this respect the greatest attention. However, at the commencement of the course, the old maxim as to the *juvantia et laedentia* in disease „what is beneficial, and what noxious“, must not be despised. Increase of pain after every bath mostly points to nervous weakness and requires a modified form of treatment, in order that greater scope may be given for convalescence. In truth nothing more decidedly contributes to the cure of chronic rheumatism than care bestowed on husbanding the patient's strength. For those afflicted with nervous debility, and also for the periods of puberty and change of life, this consideration is indeed of the highest importance.

The first symptom of improvement under the use of the Wiesbaden waters is diminution of the pain. The amelioration becomes the more evident, when during the progress the local swelling subsides. By degrees movement in the

joint is possible, and even flexion becomes more extended and takes place with less pain than hitherto. With this are associated other signs of recovery, as a better appearance, good sleep, and improved digestion.

The degree of irritation determines the necessity for movement in the affected limb; this is generally beneficial, not at the commencement of the exhibition, but after the lapse of some time.

Swelling of the serous bursæ, of recent date, easily subsides as a rule; on the contrary, very old enlargements of this kind are often exceedingly obstinate, although the affection appears much simpler than that of the synovial membrane and of the joint itself. The small bursa beneath the external ankle bone defies the application and every kind of remedy.

Those articulations in which crepitation exists present a no less considerable resistance to the action of the Wiesbaden waters. Although douches assist efficaciously in removing indolent exudations, yet here they give no confidence. The result of the treatment therefore corresponds to the peculiarity of the morbid articular condition.

As regards the progress of recovery, at first improvement shows itself by faint signs, but after some time, much more rapidly and decidedly than in the earlier weeks, and indeed it may truly be said to advance in geometrical progression. The more steadily does the treatment proceed, the more hope there is of a thorough recovery. After an insufficient use of the waters, a repetition of the course later in the same year cannot be justified on scientific grounds, still less can a procrastination of the application of the mineral water till the following year be defended; for of course the local changes do not remain stationary in the meanwhile.

The most recently affected joints are the first to show improvement; the feet more readily than the hands; the soft parts earlier than the bones; bursæ of large extent more quickly than even slighter articular changes, as has been mentioned before.

A successful issue is always in direct proportion to the increase of the patient's strength.

A timely use of the waters after the termination of the acute stage of the disease is always a guarantee for the cure of the slighter organic changes, and for the complete recovery of the patient. Chronic cases, even when the morbid changes are confined within narrow limits; but the constitution already enfeebled by numerous hardships, pain, want of night's rest, &c., require a longer time than is usually vouchsafed to the application of the waters. Real malformation often withstands treatment, as may easily be imagined, and then the result alone determines concerning the possibility and extent of the improvement.

It is only after eradication of every trace of the local lesion, and after having entered into full possession of his strength, that the convalescent patient is safe against new attacks. In this respect also, the necessity for an efficacious and thorough use of the waters is founded upon the nature of the chronic morbid conditions.

From all these undoubted facts there arises the firm conviction that in the use of the Wiesbaden waters, however much their favourable influence may prove from year to year, there is no question of any mysterious effect. No miracle is performed, no signs and wonders follow after assimilation, as during the exhibition of any other mineral water. It is only from a rational application and from a clear insight into the nature of the disease that the mechanical and physical processes accomplished by the waters run their quiet course, and eliminate, so far as is possible, the local disturbances.

ARTHRITIS DEFORMANS OR RHEUMATIC GOUT.

In former times attributed to gout on account of the serious degeneration of the joints and the severe pains, arthritis deformans was first divested of this character by English physicians, and at length GARROD has in the clearest manner proved the absence of a uric acid diathesis. CHARCOT agrees with this opinion; and the medical man would search in vain for the least quantity of uric acid in the blood, as has been corroborated here many times during the late summers.

Thus an important step, although a merely negative one, has been gained in our knowledge of this disease. The first move in a really advantageous direction was made by CHARCOT and VULPIAN, when they discovered a *correspondent participation of a morbid state in the middle columns of the spinal cord*, in so-called arthritis deformans. From this point of view the doctrine, that had hitherto been held concerning this disease, underwent such a change, that any account of arthritis deformans must necessarily take proper notice of the morbid state of the spinal cord.

Origin. — A difficulty, and by no means a slight one, presents itself in the correct comprehension of the evolution of arthritis deformans, because its distinctive character is seldom stamped upon the disease in its earliest stage. It is only in cases, advanced and well developed in their peculiarity, that we get a notion of the disease; the more as we cannot pronounce every considerable articular degeneration arthritis deformans. BILLROTH indeed unites with it another idea, for he says, that this malady is almost always mono-articular, and that it occurs in persons otherwise healthy, more frequently in men than in women, but it very seldom attacks the fingers. In Germany the ordinary name *arthritis deformans*, distinctly indicates a well defined limit to the disease. French physicians followed the same example in their designation „*rhumatisme articulaire chronique nouveau*“; whilst English practitioners marked its difference from gout by the appellation „*Rheumatic Gout*“. This malady is also called in Germany „*arthritis pauperum*“, „*poor man's gout*“, „*gout of the laity*“, but this name may easily lead to error; for to the patients at a watering-place at least are seldom denied all the gifts of fortune.

The distinctive feature in the origin of this peculiar disease is certainly the fact that *almost without exception it makes its appearance in females*. The few men, who are attacked by it, are in an advanced stage, undoubtedly persons with some affection of the spinal cord. Amongst the 52 cases which I have observed at Wiesbaden there were only 2 men. The importance of the genital functions is thereby demonstrated beyond question.

Menstruation indeed everywhere presented certain anomalies; and either sometime previous to, or immediately before the outbreak of the disease, had been in a disordered state. The periods were accompanied by pains, and especially by violent ones in the back; there was also much headache, often severe and continuous. The intimate relation of the catamenia to articular lesions shows itself by increase of the pains at the approach of the menstrual period, and by the observation that the morbid state originates in many cases at the time of the change of life.

Almost all the female patients were of delicate constitution who had suffered since their youth from great irritability, although the outbreak of the disease first occurred between their thirtieth and fortieth year.

The explanation is yet wanting, how menstrual disturbances can act upon the spinal cord and especially upon its upper portion producing the particular degeneration. In a few observations there could at least be shown an affection of the nervous system or some injurious influence acting upon it, which in the most marked manner had preceded the development of rheumatic gout.

There existed formerly cerebral inflammation, or repeated convulsions, even decided eclamptic fits, nervous asthma, or severe pains in the back and shoulders, produced by long continued suckling. Violent mental emotion had, from the patient's report, also exercised a pernicious influence. The harm done by such nervous irritation often manifested itself in a yet more special manner; for immediately after the convulsive fits, the suckling, or the excessive mental emotion, the articular affection showed itself, and the disease which appeared to be till then a simple chronic rheumatism, assumed the special character of rheumatic gout. For the future, attention must be more directed to like morbid conditions of the nervous system, than hitherto.

The special predisposition of the upper limbs, which particularly suffer, could be attributed to the more extensive use of the hands, to playing the piano, to the predominant employment of the hands in domestic affairs, &c. If such

predisposing and injurious influences were not admitted, the disease then remained within circumscribed limits.

But few of the women alluded to the influence of some violent chill; their statements, on the contrary, were in this respect, as in ordinary chronic rheumatism, somewhat vague. The relation of chill to the development of the peculiar articular changes of which we are about to treat, would certainly be very difficult to explain.

Symptoms. — Their description must be determined by a repetition of characteristic cases, in order to recognise the disease in its first germ.

The great majority of patients *attributed the deformity of their joints to the presence of poly-articular rheumatism.* Sometimes one or two articulations only suffered at first, subsequently in the course of time several became implicated. It is usually after some special cause, as has been mentioned before, that the case advances to real rheumatic gout; in the minor number of observations did the disease begin in its particular form.

The transformation of the joints in the course of a poly-articular rheumatism by accidents in connexion with the nervous system may be indeed regarded as a fact which corroborates the implication of the spinal cord in originating rheumatic gout.

But above all does the *symmetrical seizure of the limbs* place its influence beyond question. Accidental injuries may account for one side being more affected than the other. The simultaneous attack of both hands, and generally of both feet, remains in this respect the most striking circumstance.

With rare exceptions the hands are the first to present the characteristic deformity. The feet, on the contrary, may they suffer in the first attack, or in the numerous following ones, long remain stationary in the condition wrought by the preceding articular rheumatism. The feet also improve more easily, and in every season here the patient will regain in some degree their use; if positive amelioration in the state of the hands cannot be hoped for.

Further, every one must be greatly struck with the *peculiar deformity of the hands*, whose development apparently

follows fixed rules. At the wrist the external appearance of the inflammatory affection does not indeed essentially differ from that in simple rheumatism. The phalangeal joints on the contrary are already marked by a certain well defined aspect. The *first row (the metacarpal joint)* is the one chiefly attacked, of the *fore-finger* most severely; very often too that of the *middle finger*, while the same articulation of the ring finger is not always disorganised; the little finger often escapes unscathed. The first joint of the thumb suffers to an extent similar to that of the fore-finger. GARROD in the second edition of his work on Gout, p. 537, represents the changes in the hand in a very characteristic woodcut (No. 31), whilst on the contrary the coloured picture in Table IV does not correspond to the most frequent type of the disease.

In these joints the lesions developed by inflammatory irritation reach a very different degree in course of time. If the deformity has strikingly increased, the articular surfaces of the bones are separated by a profuse effusion into the synovial membrane, and very loose and relaxed articulation results. The deep crepitation on movement testifies the roughness and destruction of the articular cartilages. I scarcely ever recollect to have seen obliteration of these first phalangeal articulations.

Very different is the state of the two other digital joints, especially that of the *third* or last one. Towards their ends the fingers do not preserve their ordinary shape as in simple poly-articular rheumatism; they become *attenuated towards the tips*. In rare instances the second joint was observed to be somewhat swollen, doubtless from inflammation. The third articulation on the contrary is never troublesome from inflammatory irritation; nor does it swell, but strange to say becomes ankylosed and rigidly straight, so that the second and third phalanges resemble one bone. The last two phalanges of the ring and little finger, often share in this emaciation even when they are apparently healthy up to their first joint.

The posture of the fingers with regard to the palm of the

hand and of the hand to the forearm is no less remarkable than their disfigurement. Whilst in chronic articular inflammation flexion is the most natural position, because it alleviates the pain, and the flexor muscles, being irritated by reflex action, exercise a preponderating influence, arthritis deformans, on the contrary, has just the opposite effect upon the hand, namely extension.

The wrist is not arched but is concave, since the back of the hand is slightly stretched towards the forearm. The fingers already in a straight position from the articular changes above described, are often in a state of hyper-extension. The pronounced inclination of the fingers to the back of the hand remains however incomplete, because the fingers, beginning with the fore-finger, are at the same time strongly bent towards the ulnar side of the arm. But from this lateral direction the fingers never reassume the posture of flexion; extension being still the ruling principle. The thumb takes a similar direction; but in consequence of its thoroughly original formation, it remains in a much freer state. *All these distortions of the fingers take place imperceptibly*; pain does not call them forth, as we have already observed.

If the effusion into the first joint be considerable, from the strong muscular traction to the ulnar side, there easily arises a certain degree of *subluxation*. It is scarcely necessary to mention that *the use of the hands is extremely impeded*.

Whoever has observed a number of patients afflicted with arthritis deformans and has seen all of them within a short space of time, as happens at a watering-place, will not for one moment remain in doubt as to the *morbid nervous influence* exercised on the position of the hands and also on the peculiar articular degeneration. A highly disturbed state of nutrition and a thoroughly one-sided contraction of the muscles of the affected limb evidently exist and accomplish the peculiar deformity of the joints. To the account of the disturbed nutrition may be placed the articular affection which extends even to erosion of the cartilages, as well as the ossification of the third phalanges of the fingers, without co-operation of inflammatory irritation, and also the

emaciation of the bones and joints towards the tips. The morbid muscular contraction shows itself in the characteristic extension and lateral traction of the hands and fingers.

Even the patient's pain shows unmistakable traces of the *twofold nature of the disease*. Neuralgic pains frequently precede the outbreak of the disease and also accompany it throughout its entire course. If in ordinary poly-articular rheumatism (cases of great deterioration from violent and frequent attacks excepted) often for years together there are periods free from pain and active disease until the next acute attack recalls them, this never happens in arthritis deformans from the moment in which the malady has assumed its characteristic form. Then every movement, the slightest change of temperature, every emotion awakes the pains, which are also increased towards the commencement of the menses. Quietness and an equable temperature relieve the pains more than they do in ordinary rheumatism, in which they become worse during the night.

Lastly, one peculiarity must not be passed over, namely the *continuous progress of the disease*, already manifested by the permanent pains. Without timely treatment of a proper kind, the disease may at the best remain stationary for a very short time, but it never retrogrades of itself. In the tendency to constant progress of the spinal affection, as in tabes dorsalis, evidently lies the principle of the same phenomenon in the joints.

The wearing of boots and shoes stands in the way of great deformity of the feet. Nevertheless disfigurement extending even to subluxation of the great toe may be present. Walking under such circumstances becomes painful and the gait tottering.

What differences in origin, in symptoms, and in their course, separate the two diseases, chronic rheumatism and rheumatic gout! Rheumatic gout doubtless an affection of a unique kind, is yet somewhat allied to rheumatism from the changes produced by it in the articulations, and hence the reason for mentioning it here.

If one reflects on the distressing condition of those af-

flicted with arthritis deformans, its inevitable tendency to pursue its course, the importance of a correct definition from its commencement becomes at once evident. Unfortunately determinate symptoms are often wanting so that only minute attention to the progress of the disease can furnish precise indications.

In cases of poly-articular rheumatism the greatest precaution must be observed with persons of feeble constitution, when menstrual disturbances, confinements, the climateric years, throw their weight into the scale, and if patients have suffered from severe nervous attacks or been exposed to serious mental agitation. But that poly-articular rheumatism hitherto inclined to shift will take an unfavourable turn and possibly transform itself into rheumatic gout, we may prognosticate from the following symptoms: the hands and feet particularly suffer and above all symmetrically; the pain is constant and aggravated during the menstrual period; the joints of the vertebrae and jaws become affected and distortions of the fingers supervene.

The effect of the Wiesbaden water in the earlier stages of arthritis deformans has only been observed in a few cases; in the most instances the deformity was very pronounced so that naturally the question resolved itself into one of checking rather than of curing the disease.

We have already stated that the condition of the feet almost invariably undergoes marked improvement. It is necessary to except those cases in which they are completely disorganised. Patients generally recovered their use. Affections of the knee undergo considerable amelioration. It would appear for the rest that diseases of the feet and knee such as manifest themselves in the progress of the malady are rather accidents of simple articular rheumatism than a symptom peculiar to arthritis deformans.

In cases where the joints of the neck, jaws, and elbows have been affected they have always attained improvement; though they have never been completely cured.

If the disease of the articulations of the hand and of the fingers is of no more than a few years standing the inflam-

mation of the joints undergoes sensible amelioration. In the course of some weeks the pain diminished considerably, the swelling of the wrist and of the first joint of the fingers was much reduced; but in no case was the absorption of the exudation accomplished; though the use of the hands was greatly facilitated. Several of these patients returned year after year and thus it was possible to ascertain that the accidental relapses were unimportant and that the amelioration attained during the course had resulted in promotion of the curative process. When BRAUN asserted — according to his experience at Rehme — that the Wiesbaden waters had no influence on arthritis deformans, I presume that this careful observer referred to inveterate cases. The results attained at Wiesbaden are precisely the above described.

As before remarked I have seen even in cases of long duration, the disease brought to a stand-still. But that an energetic course of continuous baths, perspirations, powerful douches and local baths effect no change, I have had several opportunities of observing, if such treatment was applied under the essentially false idea that patients were suffering from a gouty affection, and if, in consequence of the negative results obtained, they adopted other methods for the alleviation of their malady. I therefore earnestly warn all against the danger of energetic treatment in arthritis deformans.

The water internally taken extends its influence to the affected joints as well as to disorders of the sexual organs. The baths exert a soothing action upon the pain, and calm the nervous system. Attention at the commencement of the menstrual flux will prevent the recurrence of various risks. The patient cannot expect to derive any benefit from the douche.

In successful treatment of arthritis deformans, provided that it be adopted in time, stress must always be laid upon the morbid condition of the spinal cord, whose influence in developing the malady is decisive, and above all on functional disturbances of the genital organs, which, according to all appearance are the source of the nervous disorder.

NODOSITY (NODULES) OF THE FINGERS.

Since HEBERDEN used this expression to define the small knots about the finger-joints, and CHARCOT, in his honor, adopted it, and as HEBERDEN was the first, who under the designation *digitorum nodi* definitely described it apart from gout, it will be best to follow the example set by the above writers.

It is well-known that this degeneration frequently occurs about the time when old age sets in, and chiefly attacks women, giving another proof of the rare occurrence of gout in female subjects. Whilst HEBERDEN argued the difference between the two diseases from their symptoms alone, GARROD maintains that the blood of individuals suffering from digital nodules contains no uric acid. Every case examined in Wiesbaden confirmed GARROD's assertion, even so lately as last summer, in the case of a man the whole of whose fingers were in the last degree nodulous.

The malady probably consists in an affection of small mucous bursæ. Without any morbid symptom it usually develops almost imperceptibly: the limited power of motion is indicative of its existence. The nodules usually shew themselves on either side of the third phalangeal joint, more rarely on the second; on the back of the finger; they are soft and elastic to the touch; the skin which covers them being perfectly healthy.

It is impossible that these formations can be rheumatic, their origin is wrapt in obscurity.

The Wiesbaden water exercises no sensible influence upon these nodules. STRICKER appears to have had a case of this nature in his mind when he recommends the application of artificial lithion water, as a remedy for nodules of the fingers. Repeated application of lithion water produced no change; unless in the instance of a man, in whom the knots had resisted a simple course of Wiesbaden water, but diminished sensibly upon the use of the lithion water. How long the improved condition lasted I do not know as I have no details of the case.

NERVOUS RHEUMATISM.

If rheumatic pains are unconnected with a distinct joint they are traditionally regarded as proceeding from the muscles. If one analyses isolated cases the symptoms manifest but little sympathy with the muscles; appearing however to have a far more intimate relation to the nerves of the skin and muscles.

The pains frequently follow the known course of nerves and at the time of exacerbation are sometimes accompanied by other symptoms in the same nerves; thus pains in the region of the shoulders, by pains, or a sensation of numbness, in the fingers.

The nervous origin of so-called muscular rheumatism is yet more evident if the pains simultaneously extend over various parts or one side of the body or pass from one side, for instance from one shoulder, to the other. There can then be little doubt that an affection of the nervous centre is the provoking cause of the change.

Usually only certain determinate parts are habitually attacked; the neck, the shoulder, the breast, &c., where the nerves are superficial or penetrate the sheath of a sinew or a muscle, inasmuch as they are more particularly exposed to irritating influences as: pressure or chill.

On the other hand the extent of the pain by no means corresponds to the limits of the muscle, nor does the sensation follow its course.

If muscular action awakes the pain it is just as likely to proceed from the nerves, as direct pressure exerted on the muscles, if they can be grasped between the fingers, does not usually cause pain.

Inflammation of the muscles as cause of rheumatism would of necessity involve a readily recognisable swelling. If as FROBIEP and VIRCHOW aver they found deposits in the regions of the muscles as consequence of rheumatic affections, such deposits probably proceeded from disturbances of the nutritive system arising from morbid nervousness, or were of accidental nature.

Equally with the above, *caput obstipum* excepted, the unfailing accompaniment of muscular inflammation — contraction — is wanting here.

In order to become the seat of severe pain, since the exudation is but slight and imperceptible, the muscles should be enveloped in a strong sheath which they are not.

Positive muscular inflammation proceeding from contusion or laceration presents symptoms absolutely different from those of so-called muscular rheumatism; settled pain, not radiating, of certain duration, &c.

In chronic cases of so-called muscular rheumatism it is often difficult to recognise the characteristics of rheumatism; as it is not easy to divest oneself of the idea that the pain is of nervous origin. As a rule vague pains are regarded as rheumatic.

The cause, as we have briefly stated, may have been purely local; the disease frequently manifesting itself subsequent to a local chill. True in a large number of cases the disposition to the malady — with men — lies in nervous debility produced by excess — with women in nervous irritability of the central organs, a reflex effect of an affection of the sexual organs.

No doubt can exist as to the seat of the malady being in the sheaths of the nerves, and not seldom however in those of the nervous centres, although, from lack of observations, nothing positive is known on this point. Symptoms of uterine disease and nervous exhaustion are often very pronounced and, on account of the obstinacy of the neuralgia, of vast import.

The benefit to be derived from the Wiesbaden waters does not depend upon the internal use; other disorders (sometimes simultaneous with) offer more decided indications in this respect. On the contrary the bath visibly soothes the nerves and may, if the course be systematic, lead to cure, the exhibition must however not be severe as that would probably induce the like troublesome consequences as proceed from powerful douches. In short, treatment corresponding to that applicable to neuralgia is that most to be recommended.

GOUT. — ARTHRITIS URICA (VIRCHOW).

Morbid formation and an accumulation of uric acid play the most important parts in gout. This acid, the product of the metamorphosis of certain albuminous substances, is still a normal ingredient of some organs as well as of the blood; in perfect health it is however constantly eliminated by the kidneys and passes off with the urine as useless in the bodily economy, so that the quantity discoverable in the blood is always exceedingly minute.

Diffusion of gouty matter in the body. — About the end of last century WOLLASTON and TENNANT taught that the disease of the joints in gout was caused by the presence of uric acid. According to CHARCOT and CORNIL in the earlier stages of the disease this salt is found only in the central parts of the articular cartilages, as far as possible from the region to which the synovial membrane is affixed. The superficial strata of the cartilage are chiefly impregnated with uric acid, in the interior and between the cartilaginous cells. If the uric acid be extracted the cartilage remains intact. As the disease progresses the synovial membrane will also be attacked, and in the first instance the appendices synoviales, as being less rich in vascular tissue. The parts of the membrane most affected are generally the epithelial cells. (ROUGET.)

The fluid of the joints is also charged with urate of soda proceeding from detached scales of the epithelium and is often of an acid nature.

Exceptionally, in the neighbourhood of the joints, the ligaments, sinews, serous bursæ and the cellular tissue, as also the periosteum is incrustated; according to VIRCHOW, CRUVEILHIER, FOUCONNEAU-DUFRESNE and GARROD rarely the medullar cavity of the bones; and very seldom, according to CHARCOT and GARROD, their tissue itself.

In other parts of the body, besides in the kidneys and in the blood, to which as well as to the so-called internal gout, we shall presently return, gouty deposits are met with, most frequently (GARROD) upon the cartilage of the ear

— helix and anthelix — in the form of encysted nodules intermixed with cellular tissue; on the arytenoid cartilage of the larynx according to GARROD and VIRCHOW, who also found encysted nodules here; on the auditory ossicles according to HARVEY; on the eyelids, nostrils and at the back of the nose, on the cheeks and corpora cavernosa.

Invariably and in the early stages, indeed, so soon as gout develops, according to GARROD and TODD, the kidneys are affected, not however as far as the cortical portion is in question but in the pyramidal one and in the cones. According to CHARCOT the urate of soda is deposited in and obstructs the uriniferous tubes; according to GARROD, is imbedded in the cellular tissue.

Parenchymatic inflammation of the kidneys is connected with the deposited urate of soda, but unlike other forms of Bright's disease, is of mild character.

During the attacks the kidneys nevertheless continue to secrete uric acid. When the disease has once become chronic, in the intervals the quantity diminishes in the urine, and this in the same ratio as its character grows more inveterate (GARROD); though very pronounced cases are met with in which the quantity of uric acid we encounter is perfectly normal. (HARTMANN and KÜHNE.) The secretion therefore varies and a gradual diminution proportioned to the progress of the malady has not been shewn to exist.

GARROD found also some quantity of oxalate of lime — the usual accompaniment of uric acid — in the urine.

In cases of long standing, GARROD's researches have demonstrated, that the urine invariably contains some albumen; from which it is free in the earlier stages of gout.

From the commencement of gout the serum of the blood is always charged with much larger proportions of uric acid than in periods of perfect health. Although, according to GARROD's Thread Experiment, it is impossible to prove its presence in a small quantity of healthy blood, the acid is readily discoverable in the blood of a gouty subject.

Besides the uric acid GARROD again found oxalate of lime in the blood-serum; which CHARCOT maintains is always

slightly alkaline. According to the latter the blood corpuscles do not diminish in gout; though, on account of the kidney affection, the proportion of albumen is lessened.

Up to the present time GARROD'S experiments in search of uric acid in the perspiration of gouty individuals have been fruitless, he appears to think that its chemical constitution would decide the question negatively. Some isolated instances of the contrary GARROD explains by the fact of an accidental mixture with the transpiration of the diseased articulation. MARTINI and UBALDINI confirm GARROD'S opinion, even as far as the latter point is in question.

In an instance quoted by GARROD a quantity, relatively large, of oxalate of lime had replaced the uric acid in the cutaneous perspiration.

If on the contrary serum is withdrawn from the blood by means of a blister uric acid is readily discoverable therein, and GARROD is inclined to think this as satisfactory as if its presence had been proved in the blood itself. According to GOLDING BIRD the eczematous vesicles of gouty individuals also contain uric acid.

Internal gout. — In all ages the deposit of gouty matter in the interior of the body has been a terra incognita. It is true that, according to CHARCOT, the urates pass into the cerebro-spinal fluid as they do into the serum of a blister, and, according to GARROD, into the effusions of the pleura and pericardium; *but functional disturbances of special organs resulting from deposits of urates in their tissues have not as yet been corroborated by investigation.* GARROD, unquestionably the best authority on gout, at least doubts the few isolated contradictory observations. Not less positively does BRINTON reject the theory of the existence of positive internal gout. In the few cases of this kind which have hitherto been examined by anatomists, well-known organic alterations of another nature were found; in the heart, and the large vessels (with accompanying arcus senilis), atheromatous (adipose and calcareous) degeneration, an invariable consequence of chronic maladies and the usual predecessor of retrogressive metamorphosis in old age; in the stomach nothing or only

the ordinary chronic changes; in the liver, those common to hard drinkers; in the nervous system, the anomalies usually occurring in nephritis parenchymatosa (Bright's disease).

Despite these negative anatomical results the facts remain undisputed that in gouty subjects the morbid symptoms in the joints may alternate with those in other organs, or that previously existing disturbances cease when gout sets in. As the same phenomena occur in diseases where there is no question of the presence of morbid material matter it would be against reason to admit, a metastasis in gout; the migration of uric acid. Accidental modifications in the structure of certain organs or great irritability suffice to explain, by the mediation of the nervous system, the apparent transition, &c. all the more satisfactorily as the slight solubility of the uric acid would render its transference from one region to another a matter of extreme difficulty.

Theory of gout. — In order to judge fairly of the effect of a mineral water in the treatment of gout it is impossible to dispense with some remarks on the nature and development of this disease.

There are many difficulties intervening to prevent an acceptance of the usual hypothesis that it is the consequence of a retention of the uric acid arising from some functional renal incapacity.

A diminution in the secretion of uric acid is a symptom just as prominent in chronic inflammation of the kidneys, and yet gout does not supervene. If in the urine of such patients the uric acid during the exhibition of the waters was entirely or almost wanting GARROD's thread-experiments proved that the blood contained no traces of it; although CHARCOT maintains that he has found it charged with uric acid in like cases. The administration of lead too causes a diminution of uric acid in the urine (GARROD) and in chronic lead poisoning the acid is generally wanting; notwithstanding which gout only now and again appears.

As we have already remarked, the development of gout and the amount of uric acid in the urine maintain no opposite proportion. A positive instance (a case of VIRCHOW's described

by HARTMANN as arthritis urica) here proves more than negative ones. This statement is not confirmatory of the opinion that the development of the disease runs parallel with renal changes.

In artificial retention of the uric acid as a consequence of sanguineous stasa in the kidneys (ZALESKY) the acid always accumulates in the latter in the largest quantities, but everywhere also, the nervous system excepted, and in organs, too, the stomach for instance, which in gouty persons are always free.

These facts certainly do not go to prove the admissibility of the theory that gout proceeds from disturbed renal functions. Indeed so far as the accumulation of uric acid in gouty kidneys confines itself to the medullary substance and to the pyramids just as in ZALESKY'S experiments, it is perhaps not too hazardous if we consider the changes of the kidneys occurring in gout, as processes merely secondary.

In any case, gouty deposits, in so far as our present knowledge goes, are closely connected with the cartilages and to a degree with the epithelium. It would not therefore be impossible, according to the opinions of BARTELS and ROBIN, that a disturbance in the nutrition of these tissues, more especially of the cartilages, might produce, as result of abnormal metamorphosis, uric acid. This acid would first deposit itself at the point of its origin, passing thence to the blood and gradually accumulating there. The substances artificially produced in the cartilages by chemical agency may perhaps afford some vantage ground and whilst ROBIN actually found uric acid in the fibrous tissues, BARTELS calls attention to the slight vitality of the cartilage and remarks that oxidation must be very restricted in it and hence the condition favorable to the production of uric acid. The fact, however, that the cartilaginous cells themselves remain intact when saturated with uric acid merely indicates a simple disturbance of the nutritive process.

There can already be no question of imbibition from the blood by the cartilages of the joints, nor of their incrustation from the synovial fluids; for the uric acid is first

deposited in the central part of the cartilages, far from the synovial membrane, rich in vessels, and precipitated rather in patches (CHARCOT and CORNIL).

As in a healthy condition, the uric acid, chiefly formed in the liver (MEISSNER), the spleen (SCHERER) &c., passes into the blood and, is eliminated from it solely by renal activity, by virtue of some special affinity, any surplus caused by morbid formation falls also to the share of the kidneys. The acid, which during elimination on account of its quantity and from secondary reasons, may precipitate in the renal substance in various degrees, leaves other organs unscathed and passes from the blood-serum into the transuded fluids only. Does not the fact that uric acid is entirely wanting in internal organs testify in favour of the idea that in origin of gout the local affections of the joints are of paramount import?

The cause of the special nutritive disturbances in gouty individuals remains notwithstanding unexplained; nor is it clear how the gouty material encysts on the ear.

According to this view of the origin of gout the acute attack, during which the deposition of uric salt on the joints — as a crisis — should take place (GARROD), must be otherwise accounted for. The very fact that articular gout may exist without local irritation and the nodules on the ears and other cartilages form imperceptibly, at all times demonstrates in a self-evident manner that the two phenomena, the acute attack and the deposits of uric acid, are independent one of the other. According to GARROD (p. 335) the ball of the great toe, without being affected by either gout or rheumatism is frequently in a morbid condition. Many observations made here corroborate this fact that the great toe often, and principally from local causes is inflamed as in rheumatism, in so far as the blood is free from uric acid. If in a joint thus predisposed uric acid morbidly exists, any external irritation, chill for instance (GARROD), excitement (produced by wine GARROD), pressure, &c., will suffice to provoke inflammation. The somewhat determinate course taken by gout depends upon the same reason as that evidenced by rheumatic affections of

the great toe. The malady is always chronic and in harmony with the ancient medical view, constitutional; acute articular inflammation — the attacks — set in only occasionally.

Causes of the malady. — So far but little is known of the actual causes provocative of gout. As a constitutional malady, individual peculiarities and manner of life are to be presupposed. Half the cases of gout are according to SCUDAMORE, PATISSIER and GARROD hereditary, though it rarely makes its appearance before middle age, and females are comparatively exempt.

The epoch at which gout usually attacks the latter class of patients corresponds ordinarily with the menopause. It is indeed a peculiarity of the gouty process that it only develops in either sex at the period when retrogressive metamorphoses begin to manifest themselves; if this occurs earlier, infirmity and decrepitude have set in prematurely. TODD even in his day, diverging from the current opinion declared that debilitated individuals were chiefly attacked by gout.

The hurtful effect of nervous debility, excessive mental exertion, violent moral emotion, &c., which induce in the organism premature old age, tendency to ossification, digestive disturbances, may therefore be regarded, and probably justly so, as exercising a pernicious influence upon the nutrition of the cartilages and epithelian tissues, endowed, as they are, with less pronounced vitality.

If the use of meat and spirituous liquors, particularly, according to GARROD, of beer, were more than an occasional cause of gout, the disease must have increased in our days when alimentation has become more substantial and the use of strong drinks more general. We see, besides, the most obstinate deformities and the most protracted cases of gout in individuals exposed to want and privations.

Lead poisoning appears to be frequently allied with gout only in England. In France where lead diseases occur with tolerable frequency, CHARCOT, BUCQUOY and POTAIN have seen but isolated cases so that the former is led to believe that in such persons predisposed, as they are, to gout, the influence of external circumstances is demanded for its development.

In calling forth attacks in the great toe the causes are usually supposed to be: diminished temperature, the great distance from the centre of circulation, effect of ill-fitting boots or shoes, an abnormal position of the toes or mechanical lesion. Since such causes necessarily prejudice nutrition, they may reasonably be regarded as favouring the development of the gout itself; many of them are of force with regard to other parts in which gouty deposits are formed.

Frequency of gout. — Gout is by no means a common disease. Even in England which seems to be its favoured native land, GARROD, who devoted his whole attention to its study, only saw 51 cases in nine years — annually 5 — 6 — of which one third were complicated with lead-poisoning. Besides which by far the greater number of his patients belonged to the working-class. Unfortunately he published no complete report of his observations so that it is impossible to arrive at accurate statistics from the remarks in his second edition. Indeed he is not quite free from blame that, convinced as he is, of the invariable presence of uric acid in the blood, he sometimes neglected to prove it and after the manner of the ancient doctors relying upon external symptoms and evidence, concluded its existence *à priori* — for instance p. 504 l. c., where he reproaches SCUDAMORE for frequently making statements without troubling himself to verify them.

OWEN and FULLER too maintain that gout occurs less frequently than formerly in England. According to CHRISTISON Edinburgh is quite exempt. CHARCOT speaks of its rare occurrence in Paris; COLEY makes the same remark with regard to Holland and Belgium; GEBERT makes the like report of Switzerland; and it is said to have almost disappeared from Rome and Constantinople. Hospital statistics contain records of but few cases, and gout is usually put in the same rubric with rheumatism. In Wiesbaden we have many instances of simple chronic rheumatism and a good number of cases of arthritis deformans; but very few of real gout: in the last 6 — 7 years I have seen only four cases.

Can it be, as CORRADI avers, that the frequency of gout

has diminished within the last thirty years as a consequence of the advance of civilisation and a more rational mode of life? Much more probable is it that the actual rarity may be attributed to the circumstance that greater precision prevails in distinguishing gout from rheumatism and arthritis deformans. Medical men as yet cannot reconcile themselves to primarily regarding all affections of the ball of the great toe as rheumatism. Truth will however assert itself in course of time, as in the case of hemorrhoids, whose mysterious influence in the development of disease is now rarely heard of.

Should gout nowadays really be less frequent than formerly; this may be accounted for by the fact that the nourishment taken is greater and far more attention paid to the condition of the skin.

Symptoms. — Among the joints affected, according to the opinion of all observers, that of the large toe occupies the first place; the fingers are more rarely attacked, the knees and elbows still later; the hip and shoulder very seldom. The vertebræ and the maxillary joints only suffer exceptionally. In other regions, ears excepted, the symptoms escape observation. If a number of the articulations are attacked the disease is more obstinate.

In its usual chronic course; the form of gout coming under treatment in watering-places, the joints are swollen, sometimes slightly inflamed, impeded in their movement and even now and again ankylosed (GARROD and RANVIER). In long standing cases the cartilage is sometimes found corroded and ulcerated. In some instances gouty nodules in the form of soft tumours, more frequently hard and white, sometimes complicated with abscesses, surround the joints. Patients in whom the deformity is very marked and belonging more particularly to the poorer classes, rarely seek relief at watering-places.

The disease does not invariably begin in the toes. In fact they occasionally remain healthy during the whole course, as GARROD and CHARCOT inform us. I have seen an instance of this kind in which the protuberance of the base of one little toe was alone diseased.

Acute attacks rarely come under observation in bathing-places unless provoked by the journey or some accidental circumstance.

Proof of gout. How it differs from rheumatism. — The resemblance existing between constitutional gout, simple rheumatic inflammation of the joints and the special alterations they undergo in arthritis deformans always require, on account of the treatment, precise distinction.

We must first ascertain whether any toe affection be gouty or not. If the great toe is exempt, while articulations of other limbs suffer, they may be allied to gout, even though unimportant, a further investigation is then imperatively necessary.

External evidence (nodules round the joints and ears) do not usually exist, particularly in the earlier stages of the malady, nor can there be any doubt that the pernicious influence of wine in provoking the disease, and the fact that gout is never complicated with phthisis, afford but uncertain indications.

Happily GARROD's fortunate discovery that uric acid is as certainly present (p. 96, 105) in the blood-serum of gouty patients as it is absent (p. 604) in that of rheumatic individuals, has set the question at rest for ever (p. 572). His thread-test is very easily accomplished.

After the numerous experiments of this investigator it would be vain to doubt the accuracy of the results at which he arrived. *Excess of uric acid* in the blood demonstrates *gout*; *absence rheumatism*. Every repetition of GARROD's experiment only confirms the truth of his asseveration and augments the body of material required to complete the history of gout. In how many cases formerly did the observations, upon which its history was founded, bear no reference whatever to gout!

If during the exhibition of the mineral water acute inflammations of the joints supervene they are not necessarily of a gouty nature. GARROD admits the possibility of coexistent rheumatic disease without having seen it himself. His thread-test shewed such a case in the course of last summer. A

patient with gouty nodules on the ears was attacked by inflammation of the two great toes and the joints of the feet, after the appearance of a variety of morbid symptoms. The blood itself both prior and subsequent to the attack was perfectly free from uric acid. Under the influence of another manner of life the gouty process seemed to be extinguished.

What are the virtues of the Wiesbaden water in gout? — The insignificant material hitherto collected seems insufficient for the solution of the question, some decisive observations however set the following points beyond discussion.

Like other exudations resulting from swellings and inflammatory processes, *the defused deposits about the joints*, succeeding acute attacks also experience *retrogressive transformation*. The movements become freer and the shoes which formerly could not be borne cause no inconvenience.

The nodules about the joints and ears containing uric acid underwent no modification in two very pronounced cases of gout, whence it appears unlikely that the gouty matter in the joints would be removed. Is it possible that other mineral waters containing neutral salts may boast of happier results? They are under all circumstances incapable of dissolving the urate of soda. Even alkaline mineral waters only accomplish this imperfectly. Lithion salts and artificial mineral water prepared from them alone promise favourable results; inasmuch as the natural springs with their insignificant proportion of lithion can at best during a long course introduce only a few grains into the system. STRICKER, therefore, caused a forty-fold stronger imitation of the somewhat pompously named: *Soda and lithion spring* at Weilbach to be prepared. This however is not the course to pursue in attempting the eradication of the gout. Energetically administered the alcalis act too violently, enfeeble the constitution and thus retard the recovery of the gouty patient whose constitution is already shaken.

As to the most important point experience has shewn that *a long course at Wiesbaden prevents the return of an attack for many years*. This is doubtless only then possible when the further development of the malady has been stopped. To improved digestion and important changes in nutrition

may most probably the cure be attributed. As we shall presently see the Wiesbaden waters are particularly effective in the later years of life, more especially with men, restoring vitality to the phenomna of organic life and producing a species of rejuvenescence.

The Wiesbaden waters may also be efficacious in chronic, concomitant, renal affections and in cases complicated with lead-poisoning. (See later.)

The internal and external application of the water unite to ensure the result, though with regard to the latter, and consistently with what we have before stated, nothing is to be expected from diaphoretic measures. The whole attention must be directed to the reestablishment of the strength and of the constitution. A long and complete course is invariably of primary import.

DISEASES OF THE NERVOUS SYSTEM.

Cerebral affections.

The majority of patients attacked by diseases of the above description seeking help in Wiesbaden are those suffering from paralysis, after an effusion of blood to the brain: apoplexy. The paralysis affecting one side of the limbs, of the face, of the tongue has usually disappeared before the patient's arrival.

Guided by observations hitherto made here and by common experience we can make the following statements about the peradventure amelioration. Hemiplegia of comparatively young people, and the affections arising from local disturbances at the base of the cranium, particularly if produced by syphilis, may hope with more certainty of fulfilment than those in whom the malady is complicated with degeneration of the heart and its vessels.

However inopportune a course of waters may appear so long as any excitement is apparent, there is more prospect of happier results if it is commenced soon after the attack; for old apoplexies are rebellious.

A paralysed leg heals better than does an arm or a distorted face. The power of speech may return, and more easily, when the paralysis is of the left side, even if other disturbances are not ameliorated.

Contractions of the paralysed limbs following some months after the attack are unfavourable prognostics. According to CRUVEILHIER, TÜRK, BOUCHARD and BARTH they presage secondary softening of the spinal cord.

If the pressure exercised by the apoplectic effusion in the brain is limited to the central ganglions (Thalamus, Corpus striatum), the prognostic is not unfavourable. Hope decreases in proportion as the changes progress; if the pons is affected and the fifth and sixth pair of nerves and the facialis are attacked; still more if the medulla oblongata be simultaneously compromised and the lesion has produced paralysis of one side of the members and of the opposite side of the face.

In cerebral affections anæsthesia is either cured slowly or not at all.

Another benefit, more important still than that which the patient derives from the absorption of the exudation of a past apoplexy is the restorative influence of the mineral water on his whole constitution. This amelioration, experienced before all things by individuals in whom digestion and nutrition are deranged and whose condition is hence prematurely debilitated, may prevent future attacks and postpone the adipose degeneration imminent.

During the course of treatment apoplectic seizures rarely occur. Then a too energetic application; too large doses of the water; warm baths of long duration taken in ill-ventilated cabinets about the middle of the day have been the provocatives. As a matter of course profound cerebral lesions previously existed. If the treatment adopted has been rational such an accident is under such circumstances unavoidable.

Seizures whose external symptoms are identical, and accompanied by great feebleness and paleness of the face, may arise from an anæmic condition of the brain produced by the

like external causes. A little rest and the nervous system soon resumes its normal condition.

Softening of the brain. — In slight cases of the disease a methodical use of the waters may moderate the dull headache, and lend firmness to the uncertain walk of the patient; neither internal nor external use of the waters will be pernicious. In more advanced stages of the disease no amelioration can be hoped for. The happy effect produced doubtless proceeds from improved digestion and nutrition.

Diseases of the spinal cord.

Tabes dorsalis. Progressive locomotor ataxy (DUCHENNE).

In the *posterior columns of the spinal cord* without the membranes being affected, little by little, from *continuous congestion* (ROKITANSKY, WEDL, RINDFLEISCH), an excessive formation of nuclei and hypertrophy of the connective tissue is developed. Induration of the medulla and the destruction of the nerve tubes are the consequences. Highly developed degeneration presents, in the true sense of the word, so-called: *grayish degeneration* (LEYDEN, TRAUBE, CYON).

Although the course of the malady is slow and tedious it is constant and progressive. The phase of modified sensibility is succeeded by impeded motive power, characterised by the uncertain and unsteady gait familiar to every one, which frequently degenerates into positive paralysis of the limbs. The profound disturbance of the nutritive functions appears more and more from the atrophy of the lower limbs and the back.

It is an acknowledged fact that it is vain to hope for any restoration of the medulla which has undergone organic change. All severe measures must be rigorously avoided, electricity as well as energetic application of mineral waters, alternately resorted to by the sufferers. The only thing which promises amelioration and makes life endurable under the circumstances is careful alimentation and a rational system of life.

There can be no question that chiefly at the commence-

ment of the malady good effects may result from medical treatment. The transformation of the congestion into real lesion must be prevented. Yet, for the due discussion of the subject we must first consider the origin of the malady.

The most frequent cause of this affection, commonest among men, is beyond all doubt excess, of whatsoever kind, in venereal indulgence, more particularly if the habit be traceable to those years when sexual peculiarities are developing. Even in the later course of the malady the patient is often conscious of this pernicious influence with regard to the appearance and intensity of the pain, disturbed sensibility, impaired motive power and with respect to loss of memory. From the same source proceeds the gradual loss of decision of character and the augmentation of irritability.

Venereal excess, frequently denied at first, is often subsequently naively admitted by the patient (even by the fact, readily avowed, of his having suffered from gonorrhoea, &c.). For the rest, all pernicious influences are relative in their consequences.

ROMBERG and LEYDEN (who has contributed most to the elucidation of this disease) and BENEDIKT deny the importance of venereal excesses. If this doctrine should gain ground among the public the chance of success in the treatment of patients who are a burden to themselves and to the medical man, and little good to the world, would diminish and become „beautifully less“.

Unless on a soil previously prepared pernicious influences of another kind are but slight. But under such circumstances the malady traceable even to the years of youth may be provoked by a variety of causes as: forced marches, long standing, riding, mechanical torsion of the vertebra, stooping, and in rare cases by a chill.

If as soon as symptoms of disturbed sensibility and of the usually coincident nervousness set in rational treatment be adopted the nervous system may be reestablished and the grayish degeneration, generally slowly developed, be avoided. The patient must be made aware of this fact in order that he shun all debilitating causes and must not be treated as

a rheumatic or hemorrhoidal individual, nor yet left as hypochondriacal, to his own devices.

Usually the continuous galvanic current prescribed as a remedy of chief efficacy by REMAK, CYON and BENEDIKT in advanced cases, is not yet required, although the prospect of amelioration continually decreases.

According to the origin of the tabes the indications for treatment scarcely point to a possible benefit derivable from the internal exhibition of mineral waters containing neutral salts, nor from soothing baths. The difference existing between this malady and cerebral affections becomes here very evident. Digestion and nutrition, whose importance is great in the latter diseases, have no immediate connection with the development of tabes, although dyspepsia often arises as a secondary symptom.

The waters of this place nevertheless calm the excited nerves and moderate the medullary congestion. Internally taken they exert a favourable effect upon accidental abdominal catarrh and upon anomalous digestive fermentation. A soothing course of treatment is the only one admissible.

Meningitis spinalis chronica.

Comparatively rarer than tabes, affections of the membranes of the spinal cord yet afford a far more grateful field for treatment. With few exceptions a predisposition undoubtedly exists. Even in tabes, symptoms almost identical appear as a consequence of some intercurrent provocation.

The disease almost always declares itself subsequent to intense fatigue of the lower extremities, for instance after forced marches; to a violent local chill; to a fall upon the feet, &c. Excruciating dorsal pains constantly torture the patient, and the paralysis which quickly supervenes, indicates inflammation complicated with effusion.

A course of Wiesbaden waters promptly applied before great modifications have been accomplished in the spinal cord — and the marked disturbances rarely admit of postponement — promise a result decidedly beneficial.

The patients whose cases have been under observation, were in the flower of their age. I have quoted some remarkable instances in the second German edition of this book. MÜLLER also relates some in his: „Rückblicke, &c.“

Paraplegia.

These affections, in themselves rare, as far as they are qualified for mineral water treatment, are almost restricted to young people.

A few cases of girls affected with *spinal paralysis* of children, have come under my notice and one instance of *paralysis of the inferior limbs*, soon after *scarlet-fever*, whose development proceeded still more rapidly than usually did the infantile paralysis. Here febrile symptoms ordinarily appear before the local malady is defined and are often regarded as gastric, or on account of the neuralgic pains, as rheumatic. The defective physical development invariably coincident may be regarded as a predisposing circumstance.

If in the spinal paralysis of childhood the primitive type presents variations, as for instance, paralysis in the arms, &c., the morbid condition, may nevertheless be classed among paraplegia.

The base of the disease is an effusion, often rapid, into the spinal canal.

The complete success which attended the cases treated here, justify us in declaring that the prognostic in infantile paraplegia is generally a most favourable one, the more as in the instances above-quoted the patients soon developed vigorously.

As accessory to the baths and the internal use of the waters the douch cannot be dispensed with, though as a rule its application in other spinal disease demands the greatest precaution.

Neuralgia.

Of all diseases neuralgia is the one occurring most frequently in Wiesbaden during the summer, exceeding even rheumatism. True, most of the patients attribute their suffering to rheumatism.

The etiology of neuralgia is as yet involved in great obscurity.

Its seat may lie in the nervous centres. A local congestion at the spot where the nerve affected originates; as also deposits of the most various kinds in the medullary substance then induce the neuralgia. According to the law of *excentric phenomena* the pain is transferred to the cutaneous region of the nerve attacked. Neuralgia does not of necessity proceed immediately from the central affection, this may simply create the disposition, which an accidental circumstance — chill for instance — is likely to develop into pronounced disease.

Neuralgia very often originates *in the peripheric nerve tubes themselves*. In these cases some exudation in the neurilemma and their surroundings probably maintain the pain. It is at least, as REMAK and v. NIEMEYER express themselves, to be presupposed that a disturbance in the nutrition of the nerves affected, so-called trophic perturbation exists. Still in many instances, no serious anatomical lesion may be present, as the bath alone can effect a cure; so that it cannot be a question of the specific (internal) efficacy of the saline water (see later). Neuralgia frequently manifests itself precisely there, where the nerves are superficial and but slightly protected, or enter the skin; when they pass through a fissure or the canal of a bone or penetrate sinew membranes. Under these various conditions the nerves are exposed to mechanical and other influences to which we shall presently return.

Finally *reflected pains* are by no means rare. This form usually occurs among women in whom the neuralgia is connected with uterine affections which provoke vague and diffused pain. In like manner too we may interpret a number of neuralgic diseases, in relation to inflammatory conditions of the kidneys, liver, &c.

Like the etiology, the *causes of neuralgia*, whether *pre-disposing* or *exciting* cannot in many cases be satisfactorily explained.

If *neuralgia* proceeds from a *chill*, it is merely a question, in very pronounced cases, of nervous rheumatism. Far more

frequently vicissitudes of temperature only awake nervous pains when a strong predisposition to them already exists. Even then cold is neither the essential cause of the disease nor is its base purely rheumatic as, guided by its origin, we are inclined to conclude. The pains indeed are called forth in precisely the same manner by moral emotion, physical exertion or the commencement of the catamenia. The nervous basis is here the chief point.

A fruitful source whence comes neuralgia are *mechanical influences*: blows, pressure, falls, contusions. Such is often the origin of neuralgia of the sciatic nerve, thoracicus longus, and the trigeminus (the fifth nerve pair).

Lumbago so common and so painful is also in many cases of mechanical origin. When it proceeds from a hasty movement (Hexenschuss, tour de reins) it is probable that the nerves and vessels have been exposed to some compression in the canal formed by the two vertebra involved in the movement. At the instant of this *vertebral torsion* a crack is sometimes heard resembling that provoked by other articular strains. It is very natural to suppose, inasmuch as certain vessels are involved, that congestion at the point in question may supervene which sufficiently explains the frequently rapid issue. The theory of a rupture of muscles is herewith upset. In all cases of lumbago, however, when the development is evidently mechanical, the facility with which it manifests itself in certain individuals cannot be explained otherwise than by a predisposition proceeding from irritation induced by venereal excess, or (with women) from disturbed uterine functions, confinements, &c.

Sometimes the pressure exerted by *tumours* or *inflamed organs of the abdomen* cause neuralgic pains. There is a well-known instance quoted by BAMBERGER, of sciatica produced by the accumulation of a number of fruit-pippins in the cœcum. Analogous neuralgia of the sciatic and crural nerves have here come under observation in connection with psoriasis, also coxitis, with affections of the incisura ischiadica, with nephritis (perinephritis) chronica, with cancer or chronic hepatitis. Thus too an abnormal position or hypertrophy of

the matrix (not reflective) may induce sciatica (not reflected.) The cases of this description hitherto observed appeared as metritis hæmorrhagica with some irritation, accompanied by profuse and painful menstruation and everything which could augment the disease, for instance imprudence in the external use of the water, increased the pain. A case of sciatica affecting both sides was traced to descensus uteri.

Special forms of neuralgia and their course under the influence of Wiesbaden water. — *Tic doloieux* must, on account of its peculiar characteristics be considered per se. The result of a course of the baths cannot be foreseen, a remark which applies equally to all whatsoever treatment is adopted. Douches have frequently proved beneficial. MÜLLER too speaks of their efficacy. As is the case with the application of the continuous galvanic current whose good effects VON NIEMEYER notices, accurate data on the subject are required.

Of most frequent occurrence at Wiesbaden is neuralgia of the sciatic nerve — sciatica. If during treatment it be simply a question of pains in the ramifications of the sciatic nerve, with the majority of patients neuralgia has been preceded by one or more attacks of lumbago. This fact demonstrates its central origin. If the spinal cord be once susceptible, accidental causes, such as chills, general or local, pressure, physical exertion, long standing, marching and probably other causes lead to positive neuralgia.

Has the spinal irritation extended to the upper portion of the cord and are the arms the seats of pain, the disease assumes a more obstinate character.

The treatment has not by preference to be directed to the rheumatic origin, but must have regard to the frequently central nature of the neuralgia, without neglecting the branches of the sciatic nerve — the second for instance — inasmuch as, according to EULENBERG, the malady is occasionally peripheric. For the rest, an exhibition of the mineral water rationally conducted almost invariably attains favourable results.

Far more rare is *crural neuralgia*, generally produced by the causes aforementioned.

With regard to pleurodyne, diseases of the chest are essentially in question, though the pain may arise from central causes.

The same may be said of *neuralgia of the arm*, neuralgia cervico-brachialis. Other pains in the nerves come but seldom under observation.

In the last-named species of neuralgia the treatment, relatively to the developing cause, does not differ from that laid down as appropriate in sciatica. Where uterine maladies play a part, success depends upon the possibility of ameliorating or curing the local disease; which to a certain extent is usually feasible. In chronic lung-affections the pleurodyne may subside with the cough; the same remark applies to neuralgia obviously connected with diseased kidneys.

If the irritability of the nervous system is traceable to anæmia, the curative method adopted must consist in a moderate use of the bath and unceasing care should be taken to restore constitutional debility.

Should considerable irritation, even chronic inflammation of the neurilemma be present and require a course of soothing treatment; this must never be omitted.

The manner in which in most instances neuralgia is ameliorated or diminishes is a matter of some moment and should not be lost sight of. Its course closely resembles that run by rheumatism, more especially when complicated with irritation or nervous debility in the central organs. The symptoms disappear but slowly with many oscillations. Gradually the pains being less frequent are of shorter duration and can only be awaked by influences incomparably more potent. The patient is unconsciously relieved of his sufferings. Every dereliction from the strict course laid down protracts them and the complete lack of energy displayed by many patients sometimes suffices to frustrate the best conceived scheme.

Method of applying the mineral water. — In many cases, as we have already stated, the baths alone will produce the desired effect provided they be rationally exhibited. Special indications are peremptorily demanded for the application of douches; then their immediate object is still more the

reinvigoration of the nervous system. The internal use of the water is justified by incidental considerations. It is indicated in digestive disturbances, diseases of the uterus, chest affections and chronic renal inflammation. In order to form a clear conception of the course to be followed it suffices to refer the reader to the observations on articular rheumatism. It is not the word „Rheumatism“ which calls for the internal application; but the disease of the joint i. e. an exudation arising from chronic inflammatory irritation. Hence it is plain that an energetic course of the waters, either internal or external, can under no circumstances be appropriate in neuralgic disease.

Anæsthesia. Loss of sensation.

Instances of diminished sensibility occur in affections of the spinal cord as they do in cerebral diseases. If in the latter case apoplexy was the precursor of the malady no beneficial effect can be hoped for from the mineral water. On the contrary it would appear that anæsthesia of all other kinds more rapidly undergoes amelioration than does neuralgia. In the same manner in sciatica formication soon disappears, particularly if the disease is in an early stage and induced by a congestive condition.

Cases of *nervous cramps of the face and eyelids* and *shaking palsy* underwent no change.

CONSECUTIVE DISEASES OF SYPHILIS.

Patients attacked by diseases of this nature come to Wiesbaden of late more frequently than in former years, chiefly it is true for the relief of their neuralgic pains.

Syphilitic affections had given rise to apoplectic symptoms and to intense headache or even to the latter alone; to an indolent thickening of the tibia, accompanied by the usual nocturnal pains; to suppuration of the facial bones. In one instance under the form of chronic inflammation with pains during the night the epiphyses of the fore-arm were found to be affected.

A methodical application of the Wiesbaden waters, beginning with them alone in 1855, and subsequently combined with mercurial frictions, and during the last summer with sublimate injections, will permit me to pronounce with some certainty a final verdict upon the effect of saline waters.

As a remedy for the secondary affections of a syphilitic infection the Wiesbaden water does not suffice, even though it might at first appear that we have to do with a malady of an essentially exudative nature. The action of other saline waters is equally limited in this respect. In the interest of the patient therefore a simultaneous course of antisiphilitic treatment should on no account be neglected. MÜLLER (Rückblicke) considers that the concomitant use of iodine and dec. Zitt. is called for.

Taking as precedent the treatment adopted at Aix la Chapelle I determined to make myself sure of the efficacy of mercury; but last summer for the mercurial ointment in use there I substituted the sublimate injections recommended by LEVIN and indeed with the happiest results.

As an accompaniment of a complete course, (baths and drinking) the mercurial treatment may be undertaken with perfect certainty that no troublesome accident will ensue, nor even inconvenience attend it. True, the baths alone do not suffice to counteract the salivation, the first symptom of a deleterious effect of the mercury on the body. During the internal use of the water, however, mercurial frictions, even extensively applied only produce slight affections of the mouth; they may be augmented, it is true, if sublimate injections are employed. Nevertheless a strong solution of mercury at the very worst insignificantly affects the gums about the beginning of the third week and does not always require the use of a chlorate of potash solution.

At any rate this result is satisfactory as SIGMUND, ZEISSL, MICHAELIS and LEVIN expressly advise the avoiding of salivation.

At the same time the experience obtained in Wiesbaden controverts the generally accepted opinion that the sulphur of the Aix la Chapelle waters is an indispensable agent in

curing secondary syphilis. This is an honor to which the chloride of sodium may indeed lay claim, as it is the principal agent of the efficacy of the mineral water.

These however are not the sole advantages patients may derive from a course of Wiesbaden waters. United with them mercurial treatment is incomparably more efficacious than mercury alone, a lesson taught by the rapidity with which the healing process advances where cutaneous suppuration and deposits in the bones are in question; and is still further demonstrated by the beneficial constitutional changes which soon become apparent.

If the various methods are compared no doubt can remain that the treatment with injections is far superior to that involving friction with grey ointment. The evidently more energetic action is indeed manifest from the degree of salivation, which whilst moderate in one case is almost wanting in the other.

SECONDARY AFFECTIONS OF CHRONIC LEAD-POISONING;

Paralysis of the extensor muscles of the fore-arm and of the hand undergo marked improvement so long as no adipose degeneration exists. Probably morbid symptoms in other forms, arising from lead-poisoning would experience like amelioration.

THE WIESBADEN WATERS CONSIDERED IN RELATION TO AGE AND CONSTITUTIONAL PECULIARITIES.

Numerous observations go to prove that a complete course of the waters rationally exhibited is especially beneficial *in youth*, that they exert no debilitating influence on the still feeble organism; but rather further and regulate physical development. Let us only recal their salutary effect in chronic digestive disturbances, obstinate pulmonary catarrh, defective sexual development, affections of the glands and bones, chronic articular rheumatism in young people, and the spinal paralysis of childhood.

Again when life is „in the sere and yellow leaf“, as far as regeneration of the organism is still possible, it will be effected in aged persons by the use of the waters. The individuals most susceptible to this action are those men and women inclined to obesity and who have tried a course of Banting for the purpose of rendering their „ponderous microcosmus more transportable.“

However it is not alone these who have cause to be grateful to the Wiesbaden waters. As soon as human beings attain that certain age when strength begins to decay, or when persons grow prematurely stiff and decrepid from luxurious living; from excessive mental or physical exertion; from neglect of necessary hygienic and other care for the body, then prudence with upraised hand warns us that henceforth it is necessary to fight against the decline of the vital economy. The infirmity which gradually sets in is ascribed to gout or some analogous disease, whilst in fact it is only decreased energy arising from irrational mode of living, excessive stoutness, &c. Under all the above conditions tepid baths are very beneficial from their direct action on the skin; producing the most salutary effects in restoring cutaneous vitality. Thus too nutrition, under the influence of a consistent internal course, is considerably improved by the increase of appetite and the invigoration of the digestive powers. If the plan of treatment requires some reserve in order to restrain certain possible anomalies in the abdominal organs, on the other hand the necessary exercise restores elasticity to the stiffened limbs.

The contingent of aged persons who annually visit Wiesbaden affords frequent opportunities of convincing oneself of the truth of this remark. Coming to Wiesbaden for bodily restoration these merchants, bankers, officers military and civil, return home after a course of the waters visibly strengthened and rejuvenated.

The benefit derivable from a rational hydropathic treatment, sea-bathing, or a journey by nervous and debilitated persons at an epoch of their life when they should be in the full flower of their strength, is offered by Wiesbaden when, after a life of activity, the hour of repose has come.

Naturally thin persons, exhausted by age, form an exception, in such individuals revivification of the blood and nerves is demanded and ferruginous waters are indispensable.

In women of advanced age we might be able to report like favorable results — indeed we often do see the happy influence on their constitution irrespective of the benefit accruing in their special malady — were it not that frequently complications of the genital organs difficult to overcome, are involved and prevent us from perceiving the results in question.

The foregoing remarks are sufficient to shew that the fame of the Wiesbaden waters as a powerful therapeutic agent is well founded: in effect their action extends over the entire nosological sphere in which saline waters are indicated with any chance of success. In all diseases the mineral water acts upon some local lesions and evidently in proportion to their nature; but its tendency is not the elimination of any specific morbid substance or matter whose presence may be presupposed.

ACTION OF THE WIESBADEN WATERS.

After having given an account of the healing process manifested in various diseases during the exhibition of the Wiesbaden waters some explanation of the phenomena of their effect may, up to a certain point, afford an insight into the manner of their action. Only when thoroughly acquainted with the mode of action will the physician be able to determine accurately the indications of the waters and, chiefly important to the patient, to accomplish a successful application.

I. OPERATION DURING INTERNAL EXHIBITION.

The quantity of water to be taken is regulated, as a matter of course, by the nature of the malady. But now the diseases in which positive benefit may be promised from the Wiesbaden water can generally be divided into two large groups:

Disorders of the digestive organs with which the water comes into immediate contact, and

Deeper-seated maladies which are only reached through the medium of the circulation.

In restoring abnormal digestion, or more accurately speaking, in curing chronic catarrh in most cases — that is to say, a protracted inflammation of the inner membrane of the organs of digestion, large — purgative — quantities of water may only be used for a limited period: continuously they would but increase the existing irritation.

The removal of all other diseases naturally at every time requires the absorption of the water into the blood. To ad-

minister the water in aperient doses would be to annul its internal effect. The digestive organs in this group are simply the medium for conveying the water to the blood in order that it may give full force to the intermediate organic exchange.

The conviction, that in both classes *the healing process is not promoted by purging*, will become more undeniably evident in the course of the explanation of the phenomena of the action of the Wiesbaden water. But, instead of simply saying, when this method is pursued: „the water is purgative“, use is made of the utterly incorrect expression: „the water operates“ — whereby the patient is deceived and led astray effectually.

Experience has yet shewn that moderate doses of the water are more effective than large ones — which latter by no means invariably produce the result ascribed to them in Wiesbaden — where, notwithstanding the large number of patients, all requisite *arrangements* are entirely wanting, although necessity should long ago have provided for them. If for a short time the water provokes evacuations its normally mild effect ere long manifests itself. In exceptional cases, temporarily demanding aperient treatment, recourse is always had either to drugs or to some other mineral water. The moderate quantity of salts contained in the Kochbrunnen does not suffice to move the bowels, whilst on the other hand, its heat is a positive obstacle to drastic action. Happily the efficacy of the water does not depend upon an aperient quality, the small quantity of carbonic acid would not be sufficient to maintain the balance against such an attack upon the organs of digestion.

In discussing the effect of the Wiesbaden water the chief question is: *What changes take place in the local lesions on which the disease is based, during the exhibition.* The following pages will be devoted to replying to it. At the same time, naturally, the various secretions will come under consideration.

Before proceeding to this investigation we may refer to our aforegoing observations that in diseases of more acute character the Wiesbaden waters are essentially inadmissible.

They, like all other mineral waters, can only be exhibited in chronic diseases, unattended by fever.

1. Effect upon the organs of digestion.

In cases of chronic stomach-catarrh, even when connected with ulcer, as also in affections of the bowels, chronic jaundice, or disposition to diarrhœa a rational application of the waters first causes, according to previous statements, a diminution of the excessive development of gas. Thus it is evident that the action impedes and in fact suspends, the *diseased digestive process* and the *abnormal fermentation*. No doubt the beneficial effect depends upon the muriate of soda. Necessary as the latter is in regulating ordinary fermentation, just as effectively does it limit, when administered in suitable doses, the change of organic matter. In harmony with this assertion FALK found upon experiment that neither in the stomach nor in the intestines did flatulency ensue subsequent to administration of muriate of soda. If under this influence of the mineral water the injurious effect of the abnormal contents upon the coats of the stomach ceases, the local lesions in their tissues will adjust themselves; supposed a suitable regime. In the course of a few days the appetite will return, thirst diminish and gradually the sluggish evacuations become more active.

That the Wiesbaden water should exert any alcalizing action is not to be presumed, the amount of carbonates it contains bearing no proportion whatever to the muriate of soda. The correction of any extraordinary acidity would evidently only influence the final result of the anomalous fermentation, but neither retard nor regulate it and thus imperfectly prepare the way for the radical cure of the evil. GERHARD'S opinion, pronounced with reference to the treatment of ulcer of the stomach; that alkaline remedies were of intrinsic value in this disease in removing the chronic catarrhal disturbances by which it is accompanied, is not strengthened by the manifestly favourable effect of the Wiesbaden water. We have but to reflect for a moment on the

efficacy of the Weilbach waters. Were its action according to HELFFT, who passes over in silence the characteristic phenomena produced by the sulphur spring, to be ascribed to the moderate quantity of soda it holds in solution, its curative properties in stomach-catarrh must of necessity be much greater than they really are, the more, as no mineral water so largely increases the appetite as does this. The good result of the Wiesbaden water in cases of stomach-catarrh is so rapidly manifested, and the appetite is so perceptibly augmented, that soda would scarcely improve it.

In explaining the good effect of the Wiesbaden water upon digestive diseases we need not consider the idea that the digestion of the aliment is also favoured. It is naturally impossible during the treatment to pursue this process. We are nevertheless justified in assuming that digestion is ameliorated by the muriate of soda in the water. Proportionate doses of muriate of soda indeed promote the digestive power of the stomach with regard to albuminous substances, as was proved by the digestion experiments of LEHMANN and the artificial feeding of animals by BOUSSINGAULT. As the drinking precedes the meals such an action cannot be directly due to the presence of the water in the stomach, just as the anti-fermentative influence depends on it, but is ascribable to the addition of muriate of soda to the blood, whence it is conveyed to the glands of the stomach and taken up by the gastric juice.

Through the medium of the blood the mineral water has probably a further beneficial influence on stomach-catarrhs, inasmuch, as it assists in the manner we shall presently explain, in the regressive metamorphosis of the structural thickening of the pituitary membrane of the stomach. There can however be no question that this action, as well as the favourable influence exerted on the digestion of albuminous matter, is of less importance than is its action in retarding the process of fermentation in the cure of chronic catarrh, and the opinion above expressed that after the removal of the anomalous fermenting process, the restoration of the disturbed tissue of the digestive organs may be anticipated

as the act of nature, is quite in harmony with the phenomena evident during exhibition.

The fact that the Wiesbaden water contains but a small quantity of carbonic acid, proves that this gas can be dispensed with in the treatment of chronic stomach-catarrhs and therefore can lay no claim to having accelerated the healing process when administered with other mineral waters. How far its influence may be beneficial experience shews when the Wiesbaden water is used in cases of stomach-catarrh occurring in debilitated patients if they suffer at the same time from dyspepsia. Then the water is inadmissible, as it lacks the vivifying, exciting property communicated by carbonic acid.

The Wiesbaden water is deficient also in any directly aperient salts just as it is deficient in carbonic acid. And it can indeed scarcely be supposed that in cases of disordered digestion any additional quantity would augment its prompt efficacy; for such salts are apt to do more than assist digestion, rather irritating the stomach and intestine and increasing the passage of the aliment to an immoderate degree. In treating of the composition of the Wiesbaden waters, the view has been already advocated that their simplicity of constitution is an argument in favour of their great value.

The removal of the catarrh accomplished, the close of an existing ulcer can only be effected by nature, as is the healing process under all other conditions.

The cure of chronic jaundice and of intestinal catarrhs, is as aforesaid brought about slowly because the water in either case cannot exert an immediate local influence. The amelioration may here be attributed on one hand to the removal of the accompanying stomach-catarrh and to the renewal of the normal digestive process, and on the other, unquestionably, to a more profound action of the water to which we shall presently refer.

To the restoration of a healthy digestion must doubtless also be ascribed the beneficial result of the Wiesbaden waters upon sickly and tardy physical development in early life. Disturbances in the abdominal functions traceable to the

years of childhood are very generally present in connection with other disease. The reestablishment of the nutritive functions is followed by healthy development.

In the same way the constitutional amelioration obtained by aged people from the Wiesbaden water chiefly depends on the good effect upon the digestive organs. The happy result in old age may already be observed during the exhibition of the mineral water; in contrast to this, in young people it does not manifest itself completely until some months subsequent, and then in the energetic appearance of improved development.

2. Effect of the Wiesbaden water after its absorption by the blood.

If the end in view is to facilitate the absorption of the water by the blood through the medium of the stomach, other phenomena will present themselves during the internal exhibition — united with certain changes which may be designated the *profound action*. In a series of important diseases, not immediately connected with digestion, for which Wiesbaden water was hitherto exclusively prescribed, this action is of vast importance. In spite of the apparent diversity, in all the maladies belonging to this category; with the exception of syphilitic affections and lead-poisoning, the same modus in the execution of the profound action may be assumed. Accordingly, in all of them *a local lesion of kindred nature* in fact exists — an effusion and deposit arising from inflammation, or, as it is scientifically called an exudation, which -- resembling the actual disease — appears now more, now less, prominently.

Visible exudations of this description are:

Swellings about the joints and bones, together with the so-called callus growths, in simple inflammations, subsequent to dislocations, fractures and wounds of all kinds;

Analogous changes in the joints produced by rheumatism, by acute gout after the gouty matter is deposited;

Simple inflammatory enlargements of the lymphatic and lacteal glands;

Exudations in the abdomen arising from inflammatory processes about the cœcum and womb; enlargement of the latter especially subsequent to puerperal disorders;

Infiltration of the skin, following venous inflammation, erysipelas, and in the course of various chronic cutaneous diseases;

Thickening of the mucous membrane of the throat in cases of true chronic inflammation of the throat.

Difficult to be proved and rather to be assumed, is the exudation from the preexisting disease, in chronic catarrhs of the bronchial tubes, in chronic inflammation of the kidneys and liver, in nervous rheumatism and neuralgia, partly dependent too upon other bases.

The amelioration and cure which the Wiesbaden waters bring about in the above cases — more rapidly however when assisted by the baths, which even suffice in mild cases — may be looked for earlier and under more marked phenomena — or at a longer interval. In the first place this depends upon the nature and consistency of the deposit, whether accompanied by irritation and transformable, or whether it has undergone more considerable changes; further its extent must be considered. Of weight naturally is the anatomical structure of the affected organ, its circulatory system and its function. Not less does the greater or less strength of the patient influence the exudations. On the other hand the method of exhibiting the water may facilitate or impede their absorption. Equally so the determination of the patient to aid or to interfere with nature must be kept in view, and the fact, that she will not be forced; not lost sight of.

A correct estimate of the operation, desirable as it is, is not readily attained; for thus the exhibition of the water would rest upon more fixed and solid principles.

A direct removal of the morbidly deposited substances has been suggested; but no demonstration of the *modus operandi* given, especially as to how the mineral water, following the laws which regulate the ordinary regressive metamorphosis in the course of life and in diseases, brings about an adipose degeneration in removing exudations. An increased excre-

tion of organic matter by the kidneys should at least be in favour of the conversion theory propounded.

The same metamorphosis, at least the same matter, furnished by the secretory organs is, however, met with in cases where no exudations exist — that is when none of the changes in question have taken place — where the water has been administered to perfectly healthy individuals as a physiological experiment. In any case irregularities in the interchange of matter must be not only the consequence of every organic proceeding progressive or regressive, but the product of the metamorphosis must also on account of the same structural material of the organs reoccur in the same manner. Hence various remedies, and mineral waters, appear to produce the same effect in furthering the interchange of matter, notwithstanding they accomplish other action; their different results cannot then be explained by „promotion of interchange of matter“. Further, the Wiesbaden water exhibits likewise in the secretory fluids modifications which are usually interpreted as promotion of the interchange of matter, but there are diseases in which this view is untenable; for the uric acid when wanting does not reappear whilst the oxalate of lime remains in the urine.

Thus the consideration of the excretions throws no light upon the fate of the local lesions upon which the diseases are actually based; the fundamental action therefore of the Wiesbaden water cannot be said to lie in the more vigorous metamorphosis produced in the organism, still less in the salutary influence upon one or other excretory organ.

Rather must the action of the mineral water be in intimate relation with the part affected, with the local lesion. The connection between the local disease and the therapeutic agent is yet recognisable only in special cases. In advanced affection of the kidney the urine continues pale, as we have before said; continues cloudy in catarrh of the bladder, as the Wiesbaden waters exert no influence in these affections. On the contrary in intestinal catarrh the deposits of urate of soda vanish in proportion to the action of the water on the diseased organs. Thus in the climacteric years, when

certain local changes exist, menstruation becomes too frequent and plentiful under the influence of the internal use of the water, and if its drinking be suspended and again recommenced, the menstrual flux soon returns. One may specially refer to the disappearance of morbid symptoms, nervous pains for instance, which depend upon lesions in other organs, in the womb, &c., and cease with their amelioration.

Is the mode of action of the mineral water a local one, it is certainly readily explained by the diminution of the exudation of the part affected. The process of absorption of the exudation would then, here as elsewhere, be referable to the vital activity of the organism itself. The retrogressive metamorphosis during treatment follows indeed precisely the same course it would pursue if left to itself. For instance in glandular swellings, as we have before stated, the newly formed substance, uniting the glands into masses of greater or less size, first undergoes change. It is perfectly plain that the transuded matter, the nodules, and the incomplete cells resulting from abnormal proliferation submit to retrogressive metamorphosis. The latter is also essentially accomplished in the same substances as in spontaneous healing processes.

In the ordinary course the absorption of exudations must now be preceded by diminution of the secretion; therefore any attempt to further this process must have the same starting-point. As we have already frequently remarked this metamorphosis is sooner performed if the malady is not completely terminated and if some irritation is still present. Besides, if absorption takes place — a point on which we have also previously insisted — it proceeds far more rapidly and energetically after the mineral water has been used for a time, when once the exudation has begun to diminish or has altogether ceased. According to this theory the mode of action of the mineral water is not unlike the compression by a bandage which favours absorption in so far as it prevents new secretion taking place.

That the result of the action of the Wiesbaden water may be the diminution of the exudation is actually demonstrated by many other phenomena which denote a restricting influence.

We see how quickly the suppuration accompanying swollen glands and osseous maladies decreases; how the expectoration in chronic pneumonia diminishes and how the blood therein disappears, as it does from the urine of those troubled with renal catarrh. We may also add here the cessation of morbid perspiration, and that the menstrual flux usually becomes more feeble and also that the quantity of urine voided is less.

The same influence may readily account for the circumstance that in spite of the increased appetite, improved appearance and health, patients usually grow thinner during the course, and this without the water exerting a purgative effect. This is not alone the case with stout individuals as SEEGEN of Karlsbad declares, but generally, and is yet most apparent with persons whose appearance and skin is puffy. In these instances the action of the mineral water can but limit the abnormal transudation which promotes an excessive effusion of intercellular fluids through the whole organism, only more distinguishable in certain parts of the body.

The restrictive influence of the Wiesbaden water must also as a matter of course come out, if its action prove unfavourable. Administered in immoderate doses, without producing positive looseness of the bowels or a special secretion of any kind, it no doubt interferes with nutrition and gradually enfeebles the body. If the patient is weak before the course commences these consequences the more readily ensue even if the doses be small. Under like conditions existing constipation does not disappear; but on the contrary augments, and during the earlier years of life the catamenial discharge is either retarded or decreased, whilst in the climacteric years it becomes more profuse. In treating of chronic intestinal affections, diseases of the kidneys and bladder and more particularly in nervous and spinal maladies we have mentioned such results ensuing from internal exhibition of the water.

The above facts go to prove that the action of the Wiesbaden water after entering the circulation answers closely to its antifermentative properties manifested in digestive disturbances.

Without danger of contradiction we may attribute the efficacy of the Wiesbaden water, internally exhibited, to its saline constituents, represented mainly by chloride of sodium. Stress has before been laid upon the important rôle it plays in the body so far as digestion is concerned. Its restrictive properties preserve the blood corpuscles, in combination with albumine (ROBIN and VERDEIL), from dissolution in the serum (JOH. MÜLLER).

Applied less in the production of new formation, it probably serves to maintain the physical interchange of matter; for it is a well-known fact that in the serum of the blood salts of soda and especially chloride of sodium are found almost exclusively, on the contrary salts of potassium in the tissues as also in the red blood cells which with regard to their structure approximate to them. This peculiarity of the sanguineous fluid must be of vast importance in regulating the organic interchange, as well as the secretions.

The chloride of sodium whose union with the blood is more mechanical, readily separates from it as is well-known in all secretions and transudations, particularly so during morbid conditions, in increased perspiration, in diarrhœa, pulmonary expectorations, colds in the head, &c. From this circumstance even results a manifest alteration of the normal exchange of liquid matter in the body, the transudation becomes irregular and excessive. A fact frequently proved by many pathological observations. Any addition of salt is therefore in chronic affections of this nature the most efficacious method of limiting the mischievous transudation and of preventing its pernicious consequences.

Thus the chloride of sodium has for the vital process an importance closely allied to the *antitransudative action of Wiesbaden water in disease*. Its action is altogether identical with that exerted on organic substances by common salt when technically employed, that is to say is restrictive, antiseptic and antifermentative. Every where one and the same, indivisible action.

According to the above explanation, *the Wiesbaden waters internally exhibited exercise a twofold fundamental action.*

After its reception into the stomach it ameliorates and improves digestion, and thus heals not only affections of the digestive organs themselves, but through the more perfect nutrition and by the restoration of vital force materially aids in the cure of chronic disease in general, as also in youth promotes normal development of the body and in declining years retards the progress of decay.

Absorbed by the blood the Wiesbaden waters modify the mechanical processes in the interchange of matter, that is to say regulate the morbid transudation and most chiefly impede excessive effusions and thus promote the regressive metamorphosis and absorption of exudations. Hence their special importance in cases of residues of ordinary inflammations, in diseases of the glands, in affections of the bones and articulations, in rheumatism, gout and cutaneous indurations, &c.

But yet the wholesome influence exerted by the internal use of the Wiesbaden waters is not exhausted. From the cure of any local disease, of which perhaps in the first instance there was no direct question, beneficial effects may elsewhere result. Simultaneously with the amelioration of an affection of the womb do dependent stomach and nerve affections disappear and disease of the chest diminish, arthritis deformans, in positive relation with a morbid condition of the genital functions, is arrested and follows a more satisfactory course. In such cases it is a mistake to suppose that these latter maladies which ought to be removed have been directly cured by the mineral water.

Hitherto but little importance has been attached to this secondary influence of medicine in general; yet in neglecting it, it is impossible to form any correct opinion of the mode of action of many remedies or to determine their indications.

By the action just described of the Wiesbaden waters their efficacy in chronic lead-poisoning cannot be explained. It is probably of a nature purely chemical. Here also the advantage of a course of mineral water in the treatment of chronic syphilitic maladies will find its interpretation. The chlorine of the chloride of sodium, when compared with other chemical remedies, forms with the lead the most soluble com-

bination, and does not like the sulphur, in sulphur waters, meet with any other substance — iron — in the body, with which to combine. In dissolving the saturnine deposits and in eliminating the metal, saline mineral waters hence merit the highest consideration in all cases. The chloride of sodium is also, according to the foregoing, the element of the Wiesbaden waters whose passage into the blood prevents the troublesome consequences ensuing from mercurial treatment of syphilitic disorders.

Finally it must not be forgotten that *the Wiesbaden waters internally exhibited are not exciting, as is often stated, probably the high temperature alone having been taken into consideration.* This phantom of heat soon loses its terrible character when we remember that the mineral water at its original temperature is only admissible in a very restricted number of cases and then in small doses. But those who would be further persuaded of the innocuous nature of the Wiesbaden waters with reference to its supposed heating properties should look for the excellent results obtained in heart diseases, and more particularly in angina pectoris, in cerebral affections, after apoplectic seizures, even in softening of the brain, and for their beneficial effect upon old age as upon youth.

Immoderate use might at the most interfere with nutrition and thus enfeeble the body; but this is the fault of the treatment, and at Wiesbaden troublesome disturbances of this nature are scarcely possible, or at least occur far more rarely than at places whose saline sources are more potent.

II. MODE OF ACTION OF THE BATHS.

Influence of the water.

The examination of the action of the baths naturally leads to the consideration of the importance of the skin to the body. As the external covering of the same it is an important secretory organ furnished with numerous sudatory and adipose glands. The former convey to the surface water containing certain salts. The fluid secreted in 24 hours

amounts to about double the quantity expired by the lungs. In addition a small quantity of carbonic acid escapes through the medium of the skin.

What the skin absorbs, under ordinary circumstances, is merely a little oxygen from the air whose quantity is something less than the carbonic acid it exhales.

Whilst the carbonic acid and the water of the cutaneous secretion are evaporated, the salts, essentially the salts of potassium and traces of uric acid, the fatty deposits and the sebatic acid remain on the skin, as well as flakes of the epithelium whose exterior strata continually scale off. The dust floating in the air and other substances accumulating on the skin augment the deposited matter. The orifices of the glands are thus obstructed and the cutaneous secretory functions more or less disturbed.

All treatment of the skin with water cleanses it from matter accumulated on its surface and contributes materially to facilitate its functional activity. It is self understood that the Wiesbaden waters possess this detergent property in common with others. To some extent its temperature tends to further it, though the like cannot be said of the chloride of sodium which exercises no dissolving influence upon this deposited matter; the use of a sponge, therefore, may be convenient.

Importance of the temperature.

Another and even the most important effect of warm baths is produced by their temperature. Whether this temperature be natural or artificial is of little moment; *that which is of moment is degree of temperature.* The average temperature of the baths administered in Wiesbaden is $92,8^{\circ}$ F. (27° R.) frequently even $90,5^{\circ}$ F. (26° R.). It will then suffice to examine their effects in relation to this heat.

The temperature of the skin about the trunk closely approaches that of the blood, between $97,3^{\circ}$ — $99,5^{\circ}$ F. (29° — 30° R.), whilst that of the limbs falls to $90,5^{\circ}$ F. (26° R.), or even $89,4^{\circ}$ F. ($25,5^{\circ}$ R.) which gives $93,4^{\circ}$ F. ($27,3^{\circ}$ R.) as mean cutaneous temperature (J. DAVY).

In the general baths (Vollbäder) used in Wiesbaden the temperature of the water is, therefore, invariably below the average skin heat and whilst in the limbs a slight increase of warmth is perceptible the trunk scarcely experiences this sensation. Besides, during the bath a lowering of the bodily temperature is possible inasmuch as that of the water always falls slightly. *Under these circumstances excitement and „échauffement“ cannot possibly result.*

As a matter of course the first impression of warmth is experienced by the numerous and extremely sensitive nerves of the skin which are furnished with highly susceptible organs of touch. This influence is communicated gradually to the whole nervous system and evokes *an agreeably soothing feeling*. In harmony with this effect circulation becomes less rapid and diminishes by 5 — 10 pulsations, both of the above phenomena being signs of the sedative influence of the bath, further evidence is afforded by the inclination to sleep during the repose which a very rational usage has made peremptory.

With regard to the soothing action of the bath, we can understand, *how important is the absence of a large quantity of carbonic acid in the Wiesbaden waters*. If it were otherwise the character of the baths would be completely changed and their effects reversed. Like the baths of all the mineral waters of this nature they would become *exciting gas-baths*.

During a course of soothing baths the sedative influence gradually manifests itself on *excited affections of the nervous system* — neuralgic pains (lumbago, sciatica, dysuria) consequently decrease. In simple diseases of this nature the external application of the mineral water can alone perform a cure.

If the sedative action encounters irritation accompanying *exudations and tumefactions arising from inflammation* a salutary modification in the entire region attacked is produced. The spontaneous activity of nature is thereby much promoted, and the regressive metamorphosis favoured, though this process will be more slowly accomplished by the baths alone than if assisted by the internal exhibition of the mineral water.

In the second place baths of the mean temperature of the skin exercise a powerful influence *on the distribution of the blood both in the skin and in the organism*. An extended vascular system, especially large veins, pervades the cellular tissue of the skin. By reason of the lower temperature of the limbs under ordinary circumstances, and of the condensation of the cutaneous tissue resulting from it, the quantity of blood the vessels are capable of containing does not usually flow into them. The warming of the limbs in the bath must therefore necessarily be followed by expansion of the vessels and by an accumulation of blood in them. In consequence a slight swelling of the skin and some redness may be seen.

The peculiar nature of the vascular system being taken into consideration it is not difficult to see that under these circumstances the distribution of the blood in the organism must be altered and a diminution of the blood from *the internal parts takes place*, whereby even cerebral anæmia and syncope may be produced. The reason why this, like true apoplexy, so rarely occurs, lies in the fact that the temperature of the bath is usually duly regulated.

This modified distribution of the blood exercises a most wholesome influence on *neuralgic pains, cramps, paralysis (paraplegia)* arising from *congestion or sanguineous plethora of the central organs*, particularly of the *spinal cord*. Bleeding acts, it is true, in like manner; but not with the permanently good effects obtained by methodical bathing, and frequently weakens the patient considerably.

Whether the revulsion of the blood affects the absorption of the exudations, is difficult to say; the sedative influence upon existing irritation will unquestionably contribute to it in a higher degree; since gentle heat locally applied, exerts a resolving action.

In certain affections this influence of warmth is *not entirely free from disadvantages*. It is easy to understand that *great nervous debility will not give way*, will rather increase before its sedative action. The approach of the menstrual flux is already usually provoked by the congestion arising

from the warm baths. If at the same time local irritation exists, its phenomena are hastened, even in such manner as to occasion unexpected disturbances.

What is the effect of the salts?

In opposition to the opinion formerly entertained it has been proved that *a very minute quantity, at the most traces, of the constituents of any mineral water is absorbed by the body from a bath of 92,8° F. (27° R.)*. According to PARISOT we may expect some transition of those substances which most readily dissolve the fatty particles accumulated on the skin. If as far as iron is concerned, this negative result, related by CL. BERNARD, cannot appear surprising, even of *the soluble neutral salts to which the chloride of sodium belongs, only very minute traces (WALLER, VILLEMIN, ROSENTHAL) or none at all, have been found in the secretory fluids subsequent to the bath (MADDEN, C. G. LEHMANN, PARISOT)*. A conclusive proof with regard to this question is also afforded by the observations that we have made on the insignificant action of the Wiesbaden baths (as opposed to internal exhibition of the waters) on salivation under mercurial treatment.

Since the internal application shews on a grand scale the action of the component parts of any mineral water, the detriment will not appear important which science has caused, to the formerly prevailing idea as to the efficacy of the baths. In those days no interpretation was considered admissible which did not ascribe the healing virtues of the baths to the absorption by the body of certain mineral constituents.

Not long ago CLEMENS drew attention to the penetration of the salts into the cutaneous tissues whose functions they should modify. How; is still to be discovered; though the effect produced through this medium cannot possibly be important.

If, consequently, one cannot expect from the saline constituents of the baths either direct assistance to the action during internal exhibition or a substitute for it, it is nevertheless indisputably true that the *mineral water produces a*

salutary effect on the skin which is *due to the salts*. It is thus that its beneficial influence is manifested in chronic cutaneous eruptions, and in a more remarkable manner in *ulcers and suppurating wounds* of an indolent nature, particularly in *osseous suppurations* (caries) which have penetrated to the external surface, in *gun-shot wounds*. *Ulcerations and granulations* on the portio vaginalis are rapidly cured if local treatment is combined with a course of the baths.

There is in the baths certainly an *irritating action* useful in indolent ulcerating wounds; for a high degree of sensitiveness is a counter-indication, inasmuch as the waters would then exercise an injurious effect. Evidence of this irritating property of the water is afforded by the redness produced on very irritable skins and the disappearance of perspirations arising from flaccidity.

The rapid healing of suppurating wounds depends further upon another action of the baths: *the mineral water limits the fermentation of ichorous matter distilling from the wound*. In an analogous sense O. WEBER lately suggested, and very rationally, the use of a detergent lotion of common salt.

The mode of action of the Wiesbaden waters, which contain so small a quantity of carbonic acid, exhibited in the form of baths at a temperature of 92,8° F. (27° R.), and in such a manner as to avoid all debilitating influences may be thus tabulated:

*The baths promote the functional activity of the skin;
Sooth the nervous system without producing excitement;
Withdraw the blood from the internal organs;
Gently excite the skin and suppurating wounds connected with it, and exert an essentially antiseptic action on them.*

Importance of methodical promotion of the natural cutaneous functions.

In the preceding summary of the mode of action of the baths we have not referred to the detergent influence of the water itself, we have simply spoken of a promotion of cutaneous activity, because such is the result of all methodical

cleansing of the skin, the more as the temperature of the bath doubtless contributes to this effect by inducing a considerable flow of blood to the periphery, as do perhaps, in a less degree, the salts which penetrate the tissue. The secretion of the skin, whose natural function, as is known, is to produce not perspiration, but the so-called insensible exhalation, when methodically increased during several weeks, necessarily induces an acceleration of the organic metamorphosis. *A continued use of baths, in truth, directly promotes the exchange of material of the organism.* The need of more abundant nourishment and, as final result; a profound modification and amelioration of the composition of the blood, as of the entire nutrition, are the necessary consequences.

How potent baths hereby may be in chronic diseases will be easily understood. The cure of them is often frustrated solely by want of strength and vital energy which the body does not possess. Experience indeed, has shewn that reconvalescence is in direct ratio with corporeal recovery. Whilst the baths promote the latter they materially assist in eradicating obstinate local disturbances.

The importance of a methodical culture of the skin will perhaps be apparent to the general public if persons will reflect on the benefit derived from the use of the daily bath in the earliest years of life, a custom which as civilisation advances gradually becomes more habitual among all classes of the population. A series of infantile maladies, such as cutaneous eruptions, so-called scrofulous affections, rickets, cerebral inflammations have been materially limited by its frequent application. Even the diminished mortality among children would appear to stand in some relation to the increased use of the bath. If this care of the skin were bestowed in a more systematic and rational manner, there can be little question that the benefit accruing would be greater and more general.

Still more evident is the truth of the above statement if considered in connection with the statistical details of the influence of public baths on the health of the working-classes in populous towns. In London, where they were first insti-

tuted, at the end of a year the results were surprising and although no other concomitant influence was discoverable, the number of cases in the hospitals furnishing these cheap baths was considerably diminished.

If LIEBIG declares the consumption of soap to be a scale whereby to calculate the degree of a nation's civilisation, this may with far more justice be said of the regular attention to the condition of the skin. It is even of more importance to devote assiduous care to the body itself than to the linen wherewith it is clothed; in fact, to use a very appropriate popular expression: „the body must be sent to the wash“ from time to time. Any plan is a good one, the simplest, the best. Special plans can only be justified by accessory circumstances; even in hydropathic treatment, beyond the energetic method, the positive gain lies in the culture of the skin.

The salutary effect of regular baths which we have above explained, that is the direct augmentation of the vital process, would not be increased if the component parts of the mineral water were absorbed by the body of the bather. Nor from this point of view is the utility of the baths by any means impaired by the fact that *their* important *general action* owes nothing to the presence of the salts.

Are perspirations beneficial?

To imagine that wholesome effects would accrue from provoking perspiration by the medium of baths would be to desire to lead the natural cutaneous functions into false channels; setting aside the fact that the cutaneous exhalation is checked as soon as the skin is covered by a general sweat.

Up to the present time no attempt has been made to determine how salutary perspirations induce the necessary metamorphosis in local affections. And even could azotised substances, the most important of all which are developed in these retrogressive metamorphosis of organic lesions, pass into the perspiration? The skin is not the legitimate channel

for the elimination of these matters. FUNKE, it is true, estimates the quantity of azote eliminated by the skin daily at 10—12 grammes, which assertion however is probably based upon a mere calculation; for in the perspiration collected in a sweating-chest, in which it is easily determined, WINTERNITZ at least found no trace of azote. As on the contrary the kidneys are chiefly charged with the office of eliminating azote they also accomplish this function under abnormal circumstances. By the acceleration of cutaneous activity the organic arrangements cannot be reversed. Though in certain acute diseases profuse perspirations may have a salutary influence, they are useless in the elimination of exudative residues of old standing.

As far as the sphere of diseases coming under treatment in Wiesbaden is in question, no brilliant results can be prognosticated as likely to ensue from forced perspiration. With regard to rheumatism success has not crowned the experiments undertaken for the detection of specific morbid matter in the organisation, nor of acridity in dermatoses, nor of scrofulous diathesis, formerly suspected, to which reference has been already made. The once prevailing views, according to which systematic sudorific treatment was applied in chronic disease, more particularly in rheumatism, can therefore no longer be quoted in justification of such a method. Any one, not influenced by preconceived notions, who will watch the course of chronic rheumatism under the action of the Wiesbaden baths, will have ample opportunity to convince himself of the inefficacy of the abovenamed system — or even of its pernicious effect. As for gout I have before stated the fact that urate of soda, the gouty matter never passes into the perspiration, not even when its quantity is artificially augmented.

For the purpose of overcoming chronic organic lesions, of which alone in bathing-places there is any question, diaphoretic treatment naturally could not be based upon the admission of a past derangement of cutaneous functional activity. Even in febrile maladies a healing influence can scarcely be attributed to perspirations, as this already is

in opposition to the continual evolution of the organic processes. And indeed, it may be observed, and more readily in serious disease, that slight symptoms of improvement always precede, frequently by one or two days, the appearance of the perspiration, which is but a simple consequence. In the same way after excessive bodily exertion the excretion of azotised matter proceeding from consumed organic substances always augments the azotic constituents of the urine some hours later. The excretions are not increased until the circulation in the organs, as to their physiological functions, or morbid affection, has resumed its normal activity. In acute disease even, unless artificially promoted, perspiration is by no means frequent. The details of this subject however cannot be entered into in this place.

New pains appearing during exhibition.

Reference must here be made to a circumstance not destitute of import, whose strange interpretation in former times probably led to the idea of employing the baths as a means of provoking perspiration. During their use namely, patients afflicted with articular and nervous rheumatism, as also those suffering from neuralgia and most particularly those labouring under arthritis deformans, are frequently attacked by fresh pain in the region now or anteriorly affected. Hence the saying, common in Wiesbaden: „*The water acts; it is attacking the disease; it is driving out the morbid matter.*“

These pains not unfrequently are accompanied by increased swelling of the joints, by rise of temperature and by other general symptoms. Who would deny that now in sober truth the patient is worse, a state of things brought about by a fresh chill? Attacks of like nature tormented him hitherto also, just as simple washing of the skin of rheumatic subjects often first calls forth the pains without any one dreaming of affirming that this was an essential of the healing-process.

Following the scientific axiom that the effect of any

therapeutic agent begins to develop itself at the instant it comes into contact with the body, although it may not be completed in its entirety before days or weeks have elapsed, one ought to expect from the commencement of the baths, and in all cases, these visible signs of a supposed salutary influence. Such pains however appear at the beginning, during, and towards the end of the course. After their appearance the treatment may gradually make satisfactory progress, though the pains recur far oftener when no happy result is attained, the affection undergoes many oscillations; perhaps because the water itself is not applicable or because irrational exhibition has not permitted the evolution of its efficacy.

The pains are awaked so much the more easily as the part formerly affected is yet irritable, or accessible to pernicious influences, as in disease of the great toe for instance; to the pressure caused by motion; and further according to the susceptibility of the patient and to the manner of life. If, with women, catamenia is likely to occur at the commencement of the course, and has special relation to the disease, or has undergone during the journey some modification, the bath almost invariably provokes such pains. Those seeking to induce violent perspiration, or indeed submitting to any energetic treatment are the soonest tormented. A close, hot bath-room is in favor of their development and finally bad weather tends to bring them out.

If during the exhibition of the water necessary precautions are taken a consistent progressive influence is felt from the commencement, and is in itself a sufficient refutation of the false idea that the return of pains is a favourable omen. On the contrary, the cure is always retarded thereby, and if the irritation has become intense, temporary suspension of the bathing is peremptory. Benefit the patient derives none — time alone is lost. Instead of assuring the patient that the water manifests its salutary action in this wise, it would be far more reasonable to warn him against all the hurtful influences which — and more especially in the early part of the course when first impressions are powerful — are likely

to evoke these disagreeable consequences. Not alone would service be rendered to the patient; but also to the watering-place itself whose fame would be increased by the reputation of a larger number of happy cures completed.

Unfortunately such accidents are not always to be avoided. Relapses may be feared if after the acute stage, the malady is still accompanied by some irritation and the baths have been too promptly exhibited. The weather may not be all that is desirable, or an inevitable chill may be taken.

Under no conditions would the patient submit to such homeopathic treatment as augments his sufferings under the pretext of diminishing them hereafter. And yet this irrational tradition is handed down from generation to generation; a striking proof how little influence is exercised by the Wiesbaden doctors as far as the interests of the place are concerned. In all cases the patient is the victim, if counting upon this so-called good effect of the water he consents to be tortured by the very pains from which he seeks relief.

Connection between the external and internal use of the water.

In order the more rapidly to obtain good results the internal application of the water usually proceeds simultaneously with the bathing. On that account some details as to the harmony of these two proceedings and as to their general relative value require ventilation. The water applied internally and the baths, act, it is true, each in a different manner but in many cases bring about a final and identical effect; as the observer may readily convince himself by attentively following the *modus operandi* in either process. The Wiesbaden waters may therefore often be advantageously administered internally and externally at the same time.

Whilst during internal exhibition the waters limit the transudation from the blood, and the sedative properties of the baths allay any irritation that still exists, the two processes will be united with advantage in all exudations and local tumefactions. Chronic rheumatism, gout, swellings of

the glands, certain diseases of women, exudations in the peritoneum experience these salutary effects. The action of the internal application is in direct unison with the natural healing process, whilst the baths attain the same end by more circuitous paths.

The baths however, frequently moderate any local irritation, as do tepid fomentations, and ameliorate nervous pains, which result does not accrue from the internal use of the water. Still less efficacious is the latter when compared with the immediate effect of baths evidenced in cases of suppurating ulcers.

In chronic digestive disturbances the internal use of the water is naturally the most important. Yet, in inveterate diarrhœa the influence of the baths upon the skin becomes a powerful auxiliary. Their importance is still further enhanced in diseases requiring internal application, when it is also a question of giving tone to the constitution, in infancy as in old age.

Importance of internal administration and of the baths.

Compared to the internal use baths have manifestly a far more general importance.

Constituted as the water is with special substances, its efficacy when applied internally, is accurately defined both as to nature and end. The action is always in intimate relation to some local lesion. Modifications in the organic changes do not form the starting-point of it but are its result. On the contrary in augmenting the functional activity of the skin the baths exert a general influence on the nutritive processes, even their sedative action includes the whole nervous system and the circulation of the blood; between the salts and the skin alone exists any special connection.

This general importance of the baths corresponds perfectly with the fact before stated, that the water itself and its temperature are the chief agencies to which the mineral constituents are subordinate. Herein lies the natural explanation of the apparently strange observation that baths

of the most various mineral waters if *identically applied* are capable of curing the same disease. A single instance will suffice to recal the fact. Sources of an indifferent character which contain scarcely any fixed mineral constituent, cure as do fresh water baths, chronic rheumatism, as well as baths of saline, sulphur or alkaline waters.

True that this general action of baths is often circumscribed by local lesions when the internal use of the water alone would have ensured happy results. Even in Wiesbaden inflammatory exudations and swellings disperse only slowly, or not at all, whilst internal use provokes and completes regressive metamorphosis, more rapidly it is true, if assisted by baths.

The specific efficacy of all mineral waters is invariably in relation to their internal application and precisely corresponds with their chief constituents.

The Wiesbaden waters belong to the class of sedative baths.

The importance of the subject requires us to return once more to this theme as we approach the end of our discussion of the mode of action of the Wiesbaden waters.

We have sufficiently explained why baths at 92,8° F. (27° R.), often at 90,5° F. (26° R.) of mineral water so slightly charged with carbonic acid exercise a soothing influence on the human organisation and why any idea of an excitative property should be abandoned. But whence comes it that at Wiesbaden the gentle treatment adopted in the application of the baths and in the duration of their use became in the course of time fixed? Does it harmonise also with climatic conditions?

Wiesbaden as a thermal station, as old as history, owes its fame as it does its medical teaching to tradition. Science has never actively interfered. In all old bathing-places with warm springs, the teachings of experience were founded upon the use of the bath. Now the happy effects of the Wiesbaden waters in rheumatism have always been markedly evident, and thus gave rise to the opinion that the thermal water is

a sovereign remedy in all diseases accompanied with pain which have such close affinity one with the other. We have occasionally seen how this fact has served to assemble here almost exclusively those afflicted with rheumatism and neuralgic pains of all sorts.

Now in regard to the nature of these maladies, the nervous debility so often accompanying neuralgia, and in articular rheumatism the chronic inflammation traceable to former attacks, we must doubtless admit that circumstances point to a moderate degree of warmth as most suitable in applying the baths. A higher temperature would inevitably increase the joint affection and exhaust in neuralgia the small stock of strength remaining. The more as the high summer temperature of the place would not permit of certain definite limits being exceeded.

Thus then arose in Wiesbaden the custom of *ensuring the sedative influence of the baths by giving them a moderate temperature*. This is assuredly in marked contrast with the high natural temperature of the waters!

It is now high time to recognise, both in medical works and in science, the true state of the case. To attribute to the Wiesbaden waters exciting properties would be simply to bow down to popular prejudice.

The above facts still further explain why other sources, efficacious in maladies analogous to those for which Wiesbaden is indicated, nevertheless offer frequent divergences, which may be interpreted by the different method of applying the baths as far as temperature is in question. If the warmth exceeds that of the medium temperature of the skin $93,4^{\circ}$ F. ($27,3^{\circ}$ R.), excitement will be the consequence. It is possible that in this case local circumstances: cooler atmosphere, and high situation of the watering place may frequently exert very marked influence on the organisation of the bath arrangements. At Teplitz for instance the temperature of the baths varies from 95° — 104° F. (28° — 32° R.). In Wildbad the natural temperature of the water 95° — $97,3^{\circ}$ F. (28° — 29° R.) is employed; the same holds good of Gastein, of Pfeffers-Ragatz, often too at Leuk, where it

is still the custom to administer baths of long duration. At Carlsbad the temperature of the baths is varied from $88,3^{\circ}$ — $99,5^{\circ}$ F. (25° — 30° R.), more frequently however $92,8^{\circ}$ F. (27° R.) is the heat adopted. At Aix la Chapelle the heat of the bath is often increased to 95° F. (28° R.), although the commencement is usually made at $90,5^{\circ}$ F. (26° R.).

If in these bathing-places the sources contain carbonic acid we can readily comprehend that this element modifies the effect of the bath, and the mode of administering it. At Carlsbad for instance recourse is much less frequently had to douches than at Wiesbaden, where they have long been employed, as the constitution of the water indicates their use in a higher degree.

At Wiesbaden in the height of the summer the heat of the sun and of the ground are often serious obstacles in the way of the beneficial sedative influence of the bath. The arrangements of the cabinets too do not always satisfy the requirements and exigencies of science demanded by the prevailing maladies. There is an apparent unwillingness to depart from traditional teachings, and to procure by artificial means a sufficient supply of cold mineral water.

III. ACTION OF DOUCHES.

In many maladies simple baths of Wiesbaden water do not suffice for external application; douches simultaneously employed accelerate the cure.

A jet of water having the thickness of a quill is directed with more or less force against a given part of the body for a shorter or longer time according to circumstances. The rain-douche is formed of a number of very fine jets issuing from a rose.

Thus applied the object of the douche is to produce an irritation of the part of the body touched — that is to say of the skin and those parts immediately adjacent. During application the skin becomes painful and red, swelling somewhat subsequently. A too energetic application may even lead to superficial cutaneous lesion and ecchymosis. There appear

as is perfectly evident *signs of mechanical irritation of the skin*. Ordinarily this irritation, even arising from energetic douching, if properly applied and not overdone, soon passes off.

The douche, so far as its influence on the body is concerned, may be compared to friction of the skin; to rubbing it with ointment, whereby the friction is often the chief thing; to blisters, to electricity, to sea-baths, whose advantage, beyond their low temperature which causes no relaxation, but rather gives tone, mainly consists in the action of the waves. The douche differs from ordinary cutaneous irritants in that its degree of energy may be proportioned to the intensity of effect sought to be obtained, and demanded by the exigencies of the case, and this without injuring the skin or producing excoriation. The influence of any further medicament, too, does not concur. Compared to the other irritants douches merit some preference and rank next to electricity, with which in some diseases they share the field. To prove the analogy, tic doloieux will serve as a good example, in which, experience at Wiesbaden has shewn, the douche produces the greatest effect, the continuous galvanic current has also obtained happy results. In every day life the want of the necessary apparatus for the application of the douche renders its employment difficult.

As a matter of course the douche is only *indicated* in cases where it is desirable to provoke some irritation of more or less extent. Exudations in the joints and other external parts, as well as certain nervous affections are objects essentially requiring their use.

Their special efficacy has been shewn by experience in *the treatment of local swellings and organic enlargements* proceeding from real inflammation, or from any irritation, provided the part attacked be accessible. Hence douches play an important rôle in the treatment of diseases of the limbs.

On the one side, we must presuppose that the primary inflammation has been for the most part overcome and that the local lesion has assumed an indolent character, and upon the other, that the exudation has not yet been transformed into connective tissue -- in fact has not, to use the conven-

tional expression, become indurated. True, experience teaches, that the end is attained more rapidly and the benefit more general, if the local processes still manifest vital activity, and a moderate application of the douche suffices. The same fact, as we have seen, is reproduced by the internal and external exhibition of the water.

Should the existing irritation be violent, as a matter of course the douche is inadmissible, and would only lead to an aggravation of the evil.

Among articular affections those of the bursæ mucosæ, and chiefly of the superior part of the knee are quickly benefited by the use of the douche. The same may be said of the residue of mono-articular rheumatism which is also most frequently seated in the knee. In both cases the application of the douche from the commencement of the course will be attended with saving of time.

We have already had occasion to remark that joints where crepitation is audible will not undergo any note-worthy amelioration from the douches, although the disease is usually limited to one articulation; they nevertheless deserve most confidence as to the external application of the mineral water.

The indication for exhibiting the douche in poly-articular rheumatism cannot be judged by the same standard. It will suffice cursorily to recal the causes whence the tendency to changes in the local affection proceeds, in order to arrive at the conviction that a decided, local treatment can rarely lead to the attainment of the object aimed at by the medical man. Of what benefit could douches be when constitutional infirmities of all descriptions: anæmia, uterine maladies, renal affections, years of puberty, &c., exercise an overpowering influence? So long as the rheumatic affection shews a tendency to shift its place we must beware of applying the douche. If only single joints are attacked and the pain is more fixed it is always convenient to observe for some time the effect of the baths, and of the water drunk, in order to be assured that the former has not evoked new irritation. As a means however of invigorating the nervous system (see

following section) the douche may occasionally exercise a happy influence in the treatment of poly-articular rheumatism. If decided nervous exhaustion traceable to the spinal cord, is at the base of the morbid condition, and if as a consequence pains of a more neuralgic character centre about the articulations, experience has taught that but little can be hoped for from the douche.

In arthritis deformans it must on no account be employed. The specific nature of the affection absolutely precludes its exhibition.

On the other side and with justice, they are highly beneficial in ankylosis arising from inaction as in stiffness of the joints after dislocations.

In cases of thickening of the vascular sheaths, obstructions of the veins in the limbs, infiltration of their cellular tissue, further in swellings of the glands, exudations in the abdomen and in tumefactions of the spleen, they also render important services.

Of the nervous system, belong to this category, some affections accompanied by actual exudations as: infantile paralysis, paraplegia resulting from meningitis spinalis. A fertile field is here opened for displaying the happy influence of the douche.

In articular affections, especially at the beginning of the course the pain may be increased by the douche as it is by motion. In rare cases, however, this irritation continues, and under all circumstances longer rest in bed should be taken after the douche than after the ordinary bath.

In a *second group of diseases* the effect of the douche is frequently salutary, and may even be produced more rapidly than in the affections enumerated above, without the local lesions shewing a connection so intimate with the therapeutic agent, and their nature, always having been known. On the whole various nervous diseases, feebleness and general physical exhaustion are here referred to. Under ordinary circumstances a gentle douche suffices, and an energetic one should be avoided on account of the uncertainty as to the nature of the disease. Experience alone can determine the

application; disappointments are not always to be provided against.

By the existence of obstinate pains particularly, patients must not be misled into supposing they necessarily arise from gout or rheumatism, and have recourse to the douche by way of forcing a cure, after baths, perhaps inopportunately exhibited, have failed to attain a favourable result.

Many nervous pains give way to the soothing influence of the baths alone and in all cases more rapidly without the excitement arising from the douche. They are moreover so often of central origin that to pretend to cure them, by considering only the external — excentric — pains, would be to lose sight of the nature of the malady. Each case demands the most accurate investigation.

Under the neuralgic diseases *tic doloieux* and *cervico-occipitale neuralgia* — so-called *caput obstipum* — permit the freest application of the douche according to MÜLLER'S and my own experience. The result often corresponds to the hopes entertained.

In spinal diseases (without recognisable exudations) the douche must be used with the greatest caution. At the most they may only be applied as an invigorating remedy and in the earliest stages of the malady. Debility of the nervous system, brought on by sexual excess, by forced marches, or by repeated confinements, &c., has not seldom produced a pernicious influence. If more than vascular disturbance is present, if mobility has diminished and great muscular atrophy betrays the presence of a deeper seated ill, the douche should be absolutely forbidden.

Have cerebral affections led to some paralysis the same reserve must be maintained.

Up to the present time the manner of action by which the good effect is accomplished has met with no decided explanation. Exudations which permit of tangible examination shew a diminution of the swelling. If it is a question of simple hypersecretion, as for instance in affections of the mucous bursæ; of a kind of passive condition, in which in consequence of relaxed vessels sanguineous congestion exists,

the irritation produced by the douche may lead to absorption by counteracting the relaxation and restoring normal circulation.

The effect of the douche may best be compared to the influence exercised by the pressure of a bandage on affections of the same character.

Solid exudations naturally cannot be subdued without the ordinary regressive metamorphosis. The douche must awake in the exuded masses a tendency to transformation, to decomposition by fatty degeneration, in order to be absorbed. Perhaps it will not be out of place to recal the *modus operandi* according to which the so-called „*brisement forcé*“ of ankylosis resulting from articular inflammation anticipates complete restoration. To the traumatic inflammation of the synovial membrane produced (synovitis) must according to VOLKMANN the favourable result be ascribed. Here as there the most important part of the regressive transformation is performed by the organism itself. It can under no circumstances be a question of resolving power exerted by the douche.

VAPOUR-BATHS.

It is only on rare occasions that we have any opportunity of observing the effects of vapour-baths in Wiesbaden. If before his arrival the patient has not been ordered to use them, slight indication is found here for prescribing them, unless indeed the ordinary baths have proved inefficient. This uncertain indication and the few instances that have come under my notice afford but slight material for forming an approximate estimate of their true value.

Here too the skin is the organ exposed to the direct influence and that which undergoes some modification. The final result approaches that effected by simple baths although at the beginning they give rise to some excitement. Naturally their value for rheumatic affections cannot be supposed to consist in the elimination from the skin of morbid matter suppressed by cold. Nor must the vapour-baths used in

Wiesbaden be compared to Russian baths which always conclude with a cold douche, and in which the preceding effect on the skin is entirely reversed, thus producing a powerful reaction of the cutaneous nervous system.

The region open to exploration is extensive; but it is doubtful whether the results obtained can be put into competition with the well known beneficial effects ensuing from the exhibition of general baths and douches. The practice of using vapour-baths has for a length of time fallen so completely into disuetude that only in very few of the bath-houses is the requisite apparatus to be found. Since a sedative and calming action produced by the baths — all exciting factors being excluded — be appropriate in the majority of cases seeking alleviation, it stands to reason that the more exciting vapour-baths may be out of place.

Saturation. Consecutive action.

The occurrence of saturation during a course of mineral water is still regarded as an important phenomenon, and after the treatment is concluded we hear of a beneficial consecutive action. If the term saturation is now less common in the mouth of the public than in former days when the exhibition of the water, more energetically directed, despite the doctor's motto: „nature cures“, attempted to force a successful termination; still many patients hope to derive from the consecutive action, the benefit which they have not obtained during the course.

Saturation and consecutive action are most closely connected in their causative relation. The pernicious influence of the former on the result of the course and the false idea associated with the term „consecutive action“ require explanation of the two expressions.

Saturation-point is supposed to be reached at the moment that digestive disturbances, febrile excitement appear and the general health suffers. These symptoms have nothing whatever to do with the primary disorder for which mineral water was indicated.

Such cases of saturation may occur at Wiesbaden among

patients who, according to a common custom, have been using the waters upon their own responsibility without medical advice. A course thus undertaken, without regularity, without rule, without object, naturally and rapidly provokes acute catarrh of the stomach and intestines, with their inevitable consequences: loss of appetite, &c., inducing feverishness, sleeplessness, general enfeeblement and lack of recuperative power. If on the contrary the course is directed according to rules dictated by clear comprehension of the malady and of the action of the water, not only may the exhibition be continued, as is usual, for some weeks without interruption; but may in cases demanding such modification be prolonged for some months without any inconvenience. Patients suffering from chest-diseases generally undergo with benefit a prolonged application for the purpose of dissipating symptoms betraying some threatened organic change; as also do children whose development is retarded, derive great advantage from a course of this nature. With such individuals, whose organisation is of a certainty endowed with great excitability, one arrives at the conviction that the appearance of symptoms of saturation above-described, by no means universal, and nowadays far rarer, cannot but be attributed to the medical treatment.

In earlier communications we referred to an effect closely resembling the condition known as saturation. The internal application may under certain circumstances visibly arrest nutrition, even moderate quantities of water may produce the result if the patient is feeble and susceptible. For instance one sees at all saline sources, cases of chest-affections accompanied by sub-acute symptoms of tuberculisation, even when the enfeebling applications are carefully avoided, that the patient grows weaker; loses appetite, &c. The presumption that nutrition is retarded by muriate of soda is probably one resting on the firmest basis.

Hence, that which, in Wiesbaden and indeed at saline sources in general, is understood by saturation, is connected partly with disorders, such as those quoted which are not likely to be alleviated by the use of mineral waters and partly

to the attacks of disturbed digestion, feverishness and so on which arise from an irrational course of treatment, too long and energetic.

As a rule saturation, with mineral waters of the most various constitution, alone results from unreasonable treatment. Naturally the basis varies according to the predominant mineral element. Sulphur waters may attenuate the blood too much, an effect they sometimes produce with extraordinary rapidity during the years of development if a tendency to chlorosis exists. Their antipodes, the ferruginous waters, whose salutary influence is mainly due to the carbonic acid, frequently excite too violently, chiefly in cases of any local irritation as evidenced in many female diseases. Alkaline waters, resembling moderate antiphlogistics, under certain circumstances exercise an influence so profound upon digestion and nutrition that the urine may become alkaline &c.

In so far as saturation results from inappropriate use of the water it is in intimate relation with *the consecutive action*. If by a false method of application the body has been deprived of power of activity, of organic renovation, and if the disease, for the rest curable, has undergone no modification, it is perfectly comprehensible that only after the termination of the course, when sleep and appetite have returned is any amelioration possible.

But can it really here be a question of consecutive action of the mineral water? The fact indeed very insufficiently justifies the expression. Rational treatment would have commenced the healing process during the course itself, and relieved the patient from his troubles. Only then when by some fault of his own or by some accident, the treatment has been badly carried out may he go home bearing with him as a consolation that comfort afforded by the hope of consecutive action. The conscientious medical man must not however terminate his connection with his patient by fostering any such delusion.

The primary axiom of the entire healing art is as I have before observed: „Every remedy acts from the moment it comes in contact with the body.“ The transformations which

arise from it reveal themselves, in chronic maladies also, to the careful observer, within a few days. Does not cod-liver oil for instance of which, falsely enough, it was said that its effects are only evident after the lapse of some months if really indicated, first provoke amelioration of digestion? Complete cure, it is true, depends upon the nature of the disease and is only established sooner or later. It is then quite incomprehensible that a remedy may and must be employed for weeks or months in order to produce salutary effects, not immediately; but at some remote period.

In the manner described may be seen in Wiesbaden as in every other watering-place that, the local lesion not being radically overcome, the improvement made during a 3—4 weeks course advances during the time immediately subsequent to the cessation of the treatment. This however is not a proof of consecutive action; but rather the clearest evidence that usus affords no scientific guide for regulating the duration of the course.

Even if with children and young people development receives a fresh impetus during the months following the use of the bath, or if former dermatose vanishes as the constitution is fortified, we cannot speak in the usual sense of consecutive action, nor equally when after water-treatment aged people for a length of time shew signs of a certain rejuvenescence arising from augmented vigour in the vital process. During the course the mineral water has already accomplished its work in the restoration of the digestive and nutritive functions. If young people did not within themselves possess developing power a course of the waters would not produce it, and with old people it is the possibility of improving digestion which assists the recuperative organic processes.

DIRECTIONS FOR EFFICIENTLY CARRYING OUT THE WATER-TREATMENT.

Under all circumstances, for carrying out the course the nature and character of the morbid disturbances on one side, and the mode of action of the mineral water on the other, determine our line of conduct. The deeper our knowledge of these, the more certainly shall we take the way which leads to our object. On this ground the patient should always at the watering-place be guided by the advice of his physician, who, from the study of all the diseases that there come into question, has to a certain extent become a specialist. The following attempt at a detailed statement concerning the carrying out the water-treatment will therefore only afford occasion to the patient to follow the directions of his physician with the greater submission. Should the patient undertake a course without medical advice, he must always keep in mind the explanations previously given, whose object is to afford an insight into the nature of the morbid processes, as well as into the mode of action of the Wiesbaden water, and he must the more strictly adhere to the principles that have been enunciated concerning its exhibition.

Like all other organic processes the course of disease always follows fixed laws and therefore requires a certain length of time. If the treatment is in accordance with these laws, recovery may indeed be accelerated; to endeavour to obtain it by force, would however be labour in vain. And lastly it must be particularly remembered that favourable changes in protracted diseases can never be expected to be attended by striking symptoms, nor do such changes arise

from the remedies applied. In organic nature there are only gradual evolutions. In diseases likewise nothing appears suddenly without having been prepared beforehand in its proper way.

In every water-treatment of a chronic disease there are two problems to be solved. Not only must the local affection be allayed, but the general condition requires equally the most attentive care; for restoration to lasting health must always be the object in view.

Should it appear to the patient that the most important matter to him is the being freed from the sufferings of his disease, yet in the course of application of the water attention to the general health will force itself prominently into the fore-ground. According to the nature of the thing the efforts directed to this point are crowned with success disproportionately more quickly than does the healing of the disease itself take place. Only from small beginnings can the removal of the local disturbances be progressively brought about. But this again occurs solely at the rate in which recovery, under improved conditions as regards the general health, is carried onwards to its completion.

Now, what can promote recovery more naturally than the corporeal functions being discharged in a thoroughly normal manner? These must therefore be attentively guarded against disturbance, and in case they should present irregularities, they must be brought as speedily as possible into a healthy state. *A healthy digestion with a good appetite, as well as thoroughly normal secretions, and sound refreshing sleep are to be striven after above all things.*

THE DRINKING OF THE WATERS.

In the part of this work treating of the mode of action of the waters it has been already set forth that on one hand the allaying of chronic catarrh of the digestive organs is the task to be accomplished by the drinking of the waters, on the other hand the healing of a number of serious diseases (which the water cannot reach but by the medium of the circulation),

often arising from inflammatory or congestive disturbances, such as chronic articular rheumatism, simple affections of the bones and joints, glandular swellings, deposits in the peritoneum, female disorders, affections of the liver and spleen, pulmonary catarrhs, and renal diseases. The treatment adopted must therefore, in abdominal catarrhs, aim at improvement of the digestion, *without augmenting the irritation already present*, in all other diseases *at facilitating the passage of the mineral water into the circulation*, in order that the water may act efficaciously at the seat of every disease in question.

The two methods of drinking the waters. — The Wiesbaden water may be drunk easily in draughts at its natural temperature, but generally it is allowed to cool before being swallowed. In the latter case the limited time considered, it is only warmth that is lost; the small quantity of carbonic acid, disproportionately less than the water can contain at ordinary atmospheric temperature, remains on the contrary almost entire, and the fixed constituents, especially the soluble salts and the most important ingredient, common salt (chloride of sodium), undergo no change at all, so that *the mineral water by cooling manifestly does not lose any of its efficacy.*

At Wiesbaden it is now usual to drink the water in two ways. According to the first method the patient takes a moderate draught of the freshly drawn water at intervals of from 5 to 8 minutes, until his glassful is finished: hence, at first the water is warm, then tepid, and at last cold. But it must not be thought that the absorption of the first portion has already taken place in the stomach before the following one arrives there; this act not being accomplished so quickly, as is proved by the simplest physical examination of the stomach.

According to the second method, the water is only drunk at its natural temperature, when it is necessary for it to be so taken, as in affections of the stomach, in chronic diarrhœa, in pulmonary catarrhs, because in these cases the calming influence of the warmth produces a direct benefit. In all

other cases, in which cooler water may be suitable, there is added to the freshly drawn water, in the proportion of from quarter to half, cold mineral water (a supply of which is always provided by the attendants at the spring), until the temperature is nearly the same as that of the stomach, viz: 97,3 to 99,5 ° F. As regards the warmth of the water the digestive apparatus does not then receive any peculiar impression, neither does the passage of the water into the blood experience any impediment. Of this mixture only a definite quantity, about half a glassful, is drunk at once, but without hurry, and after *half-an-hour's pause*, the dose is repeated, and so gradually until the prescribed quantity of water has been taken. Should the action of the bowels be torpid, one must adhere in a similar manner to cooled or even quite cold mineral water, which, on account of its slower absorption, promotes the alvine evacuations.

Drinking the water in this second method, the patient is not obliged to carry about his glass of water, and he can therefore prolong his morning walk the farther. As regards the curative effect of the mineral water the two methods are alike; the choice of one or the other therefore depends solely upon the view taken by the physician.

The most important point, *the quantity of water to be taken*, can of course only be discussed in general terms. Although the water contains a moderate amount of salts, of mild nature, and not difficult of digestion, yet in digestive disturbances a large quantity of it may easily augment the pre-existing irritation of the mucous membrane, especially when any ulcerative formation is present. In such cases therefore only a moderate quantity appears permissible, and this moreover ought to be taken at different periods of the day; altogether a glass containing from 8 to 10 ounces being sufficient.

In the other series of morbid conditions already mentioned, a too abundant drinking would impede the passage of the mineral water into the blood, because on this absorption success unconditionally depends. For the morning which is the chief time for drinking the water, in many cases a

glass and a half to three glasses, is quite enough; sometimes more water may be taken. One should however guard against increasing the number of glasses, when the hoped for effect does not appear. It is only up to a certain point that a successful result increases with the quantity of the mineral water. Without doubt the correct principle is: *not to offer to the system more than is required by the malady.* Therefore it is only the physician, who thoroughly understands the state of affairs, that can give the best advice.

Attention may however be judiciously directed to a few points.

Should the action of the bowels be sluggish at first under good treatment, yet by continuing quietly they will generally after a short time become regular. But should this not take place, it is because the mineral water usually acts too bindingly on the free activity of the system. Nervous disorders, great bodily weakness, &c. are then indeed present, and such conditions decidedly contra-indicate the internal exhibition of any saline water.

A methodically laxative treatment is a plan but little adapted to set in action the curative effect of the Wiesbaden water. A tendency to sluggish stools is already imperfectly counteracted by simply increasing the action of the bowels; as this certainly offers no guarantee for normal evacuations afterwards. This result is not surprising, if we glance at what has been stated concerning constipation. At watering-places, where the preponderating cases seeking recovery are abdominal affections, the laxative method is therefore going more and more out of use. In Karlsbad one is earnestly warned against it (KISCH). The experienced BALLING at Kissingen expressed himself thus to a patient: he was atonished that patients lived in the belief that they must be purged. It is also a grievous mistake to consider looseness of the bowels a sign of good digestion. Because looseness impedes the reception of nutritive materials and passes them too quickly through the intestinal canal, it on the contrary occasions considerable disturbance of the digestion.

How injuriously such a false method works for many

patients at Wiesbaden can be readily proved by a great number of examples, because the application is often undertaken here without medical supervision. The advice of the experienced physician is often first sought only after the digestion has become disordered. The necessary interruption of the water-treatment is then almost the least inconvenience; the previous use of the waters has, as a rule, wrought no improvement at all in the disease to be cured; not seldom does the disorder become worse in consequence of the feverish excitement produced. Arthritis deformans, many cases of simple chronic rheumatism, gout, pulmonary catarrhs, nervous and female disorders, affections of the kidneys, especially do not permit of this energetic internal exhibition, if patients are to expect from the water-treatment the desired effect.

The principal time for drinking the waters begins about 6 o'clock in the morning, in the hottest months, even earlier, and ends as a rule about 8 o'clock. It precedes breakfast, because a fasting stomach favours absorption. ERICHSEN could already demonstrate in the urine the first traces of soluble salts 5 or 6 minutes after they had been taken on an empty stomach; after a meal their appearance was delayed 40 minutes.

Debilitated patients may indeed take a little coffee or tea before drinking the waters, according as their habit may be.

In very many cases drinking the waters here terminates for the day, and it is not to be denied that the quantity of water, considered in itself, is perfectly sufficient for attaining the recovery aimed at. A repetition of drinking at other periods of the day, from 11 to 12 o'clock, and in the afternoon about 5 o'clock, is not founded upon the idea that a more abundant quantity of water can accelerate the progress of recovery, but proceeds from the following consideration. The action of the mineral water must of course be continued in an uninterrupted state. Now easily soluble salts, as common salt, are soon eliminated again from the system by means of the excretory organs, and especially with the

urine. If then it is a question of deeply seated changes, a repetition of the drinking is certainly to be recommended. The quantity taken in the morning may then naturally be lessened. Such a course manifestly insures the most fruitful result and moreover precludes all injurious effects upon the intestines as well as upon the constitution. For Wiesbaden, which is at the same time prominently a place of amusement, this course has besides the advantage of confining the patient more closely to his water-treatment, and of guarding him from the prejudicial influences of the watering-place dissipation. The experience of the last few years speaks very favourably of such a plan of drinking the waters.

In years of exceptionally cool temperature, or when cold days occur in summer, as well as when the visit to the watering-place is in spring or autumn, the time of drinking the waters may be so far modified that the exhibition is begun, i. e. the first glass of water taken, a few hours after breakfast. This may be done without any prejudice to success and the patient will not be exposed to the injurious effects of the cold morning air.

The motion necessary during the drinking of the waters. — Between his separate draughts of water the patient must walk about, regard being however had to his disease and his strength; and after his last draught he must also take a walk of half-an-hour's length. On the one hand this moving about favours the absorption of the water in the stomach, and on the other is essentially necessary to the promotion of recovery; on this point refer to the section of this work on „the manner of life.“

The Trinkhalle with the adjoining avenue in the Taunus Strasse, as well as the neighbouring Kursaal grounds, the avenue in the Wilhelm Strasse, and the New Gardens, are well adapted during the separate times of drinking the waters to half hour walks. The further one's steps are extended in the fresh air the more beneficial will the walks become. As termination to the daily routine the patient may therefore stroll about the Kursaal grounds, follow the path to Sonnenberg, or go through the Taunus Strasse to the Nero-

thal, or turning short to the right at the end of the Trinkhalle he may mount the Geisberg, or at the entrance of the Kapellen Strasse gradually ascend to the Neroberg through the lovely Dambachthal. When the weather is bad the promenades must be limited more to the Trinkhalle and the neighbouring spacious Colonnades.

THE EXTERNAL USE OF THE MINERAL WATER.

General baths and douches are now at Wiesbaden the most usual methods of employing the water externally. Vapour baths, as well as fomentations of the water applied to external parts of the body, are seldom used, and for them the patient ought to receive special medical instructions.

Temperature of the bath. — The characteristic effect of the baths depends, according to what has been stated about their action, upon the warmth of the water. Herein they are just the opposite to cooler baths. The limit which in this respect accurately defines two classes of the warm bath, is evident from what has been said before: it is the average temperature of the skin $93,4^{\circ}$ F. ($27,3^{\circ}$ R.). Should the temperature exceed this point, then heat will be supplied to the body from the warmth of the water, an over-heated state will ensue, augmenting with the rise of temperature, whereas on the contrary when the baths are only $92,8^{\circ}$ F. (27° R.), or a little lower, their thoroughly *calming and derivative influence can make itself felt, without producing any prejudicial excitement.*

According both to theory and practice this latter temperature for the baths is suitable to most of the diseases which are cured at Wiesbaden. All debilitated patients, who are readily sensitive to any excitement, as well as most nervous disorders, require a somewhat cooler bath, viz. one of $90,5^{\circ}$ F. (26° R.), and for nervous men the temperature may often be advantageously a little lower, whilst really cold baths reduce their natural heat too much. Less frequently are baths of 95° F. (28° R.) and higher, necessary. On this point the opinion of the physician must always be deci-

sive. The patient ought never to feel cold in his bath, and may therefore even in disorders, which only derive benefit from a cooler temperature, begin with baths of $92,8^{\circ}$ F. (27° R.). Of course during cold weather the baths may and should be taken somewhat warmer.

If the patient wishes to guard himself from injury, he will above all direct his attention to the temperature of the bath suitable to his malady, and will accurately watch the same. Neither must he allow himself to be misled by his sensations, to which a higher temperature is often more agreeable, although it generally frustrates the purpose. Whilst being used, the bath does not as a rule during summer cool so much as to require the addition of warm water. On the contrary care must be taken that the bathroom be not too hot and too full of vapour, which may easily happen in old and ill-arranged bathing establishments, in which the temperature may rise to $82 - 88,3^{\circ}$ F. ($22 - 25^{\circ}$ R.). A too warm bath entails as a consequence excitement of the circulating and nervous systems, weakness of the cutaneous organs, tendency to perspiration, and thereby to danger of taking fresh cold, premature appearance of the menses, increase of existing pain with return of that which had disappeared, and other injurious circumstances.

During very hot weather, especially in years with a high summer temperature, the warmth of the ground in the region of the hot springs, which exceeds that of the ground elsewhere by about 41° F. (4° R.) presents an impediment to the cooling of the mineral water, which is difficult to be overcome, particularly as efficient arrangements are wanting for lowering the natural warmth of the water in the reservoirs by a stream of fresh air. Should it then not be possible to reduce the bath lower than 95° F. (28° R.) and a cooler bath is requisite, it must be prepared by adding ordinary cold water to the mineral water. From the explanations already given no further proof is needed that the effect of the bath does not thereby suffer any damage, whilst the injury wrought by too high a temperature would without question be considerable. In medicine one must not reckon

with dogmatic notions, and seek to guard one's self from prejudices; the patient who suffers injury, has the most cause to wish for this. Were it more possible at Wiesbaden than it now is, to arrange the baths at all times to suit the respective maladies, that legend about eliminating morbid matters would soon die out, and the watering-place itself would see its prosperity advanced by numerous and successful cures.

There necessarily follows from the decided influence of the temperature upon the effect of the baths the second important point concerning their use, viz. the decision as to their *duration* and *repetition*. This powerful influence of the temperature upon the body, upon the nervous and circulating systems, always imposes a certain limit, a neglect of which during the course may be heavily avenged. Therefore even the old physicians have long ago given up the evil practice once prevalent at Wiesbaden, of prescribing bath of some hours duration. A more moderate use of the bath is also usually demanded imperatively by the nature of the diseases, that successfully seek relief at Wiesbaden. How often have patients from their pains retrograded in strength, or there may be from the very commencement nervous weakness, and as in rheumatic gout, even serious disorder of the spinal cord, and how often there remains a considerable remnant of the former state of irritation at the seat of the disease, and one has to deal with the development in youth or with recovery in advanced years!

Although it is nothing more than childish to propose as a rule a methodical increase of 5 minutes at a time, yet there are difficult cases of illness, which admit of only a very short stay in the bath; in this matter without doubt the decision of the physician in attendance, here steps in and dispenses with further particulars. Without any injury and in the hope of striking the right path, one may begin with 20 minutes in most maladies. For the following days however one must remain stationary at this point, and only when the effect of the bath does not prove prostrating, which point will soon be discussed, may the time be extended to half an

hour and soon to three quarters of an hour. At Wiesbaden the patient seldom now remains longer than an hour in the bath. As a rule even half an hour suffices, and a longer stay in the bath produces no greater benefit, more frequently it checks by weakness that recovery of the system which is so necessary. Experience thoroughly confirms this view.

Though a successful use of the baths by the salutary result on the general health always contributes to a restoration of bodily strength, their essentially sedative effect can claim no directly invigorating influence. As a general and indeed quite a natural consequence of the soothing baths, especially when taken daily and without intermission, the patient, during the first few days, (between the third and the sixth bath) has therefore a feeling of lassitude and exhaustion. Drowsiness afterwards is sometimes its principal symptom. The altered mode of life at the commencement of the treatment; the early rising; the morning exercise; the water taken fasting, united with climatic and other influences, of course powerfully cooperate on the patients system.

If one wishes to avoid this lassitude, which is by no means beneficial, the baths must at the beginning be taken only two days in succession, and then intermitted; when there is extreme weakness and much irritability, even the bath ought to be applied every other day and be also limited in duration, until the body has become accustomed to the warmth. When this feeling of lassitude appears, an interruption to the baths is scarcely to be avoided. Afterwards this symptom appears less frequently; nevertheless one will do well, after every 6 or 8 baths to abstain from bathing for one day; because during this pause the body recovers itself, and a speedy increase of strength richly makes amends for the supposed encroachment on the result caused by the interruption.

Many persons even in the later weeks of their sojourn must not bathe every day without intermission, if they wish to obtain as much benefit as possible from the treatment. Weak patients, old people, those who hasten to Wiesbaden immediately after a severe febrile affection, also most of those who suffer from nervous disorders, or women with uterine

diseases, or with rheumatic gout, many cases of ordinary rheumatism with important complications of the nervous system, all such patients as these must either as a rule bathe only every other day, or at least once in the week make a pause between their baths.

If the baths are taken at a lower temperature and if the weather is cool, there will be less feeling of lassitude, and it will not be necessary for the patient to interrupt his baths so frequently.

Bathing ought to cease a few days before the catamenia; for, as a rule, after a succession of baths, the menses appear 3 or 4 days earlier. At the first sign of their regular approach bathing must be entirely suspended, although the proper period be then already over-stepped. The presence of irritation in the organs concerned, strongly indicates the suspension of the baths still sooner, especially if the menses be abundant, immoderately prolonged, or appear before their usual time.

Number of baths and duration of the course of treatment. — The principles concerning the suitable succession of the baths strictly accord with the total number required for a successful result, and with the duration of the course though they may be at variance with the ordinary rules. At Wiesbaden, agreeably to ancient tradition, the bath is ever the unit according to which the duration of the exhibition is reckoned. If this for example be fixed at 3 weeks, 21 baths are understood by that time. A course of water drinking without bathing is exceptional.

As regards the duration of the water-treatment on the ground of real advantage to the patient, there is but a single leading principle; the only scientific one, namely: *The mineral water is to be applied as long as is necessary*, and during this time such a number of baths must be taken as promises a beneficial result, without causing injury, even for a single moment. However in the majority of cases a medical dogma is decisive: *the celebrated number 7*. This is moreover in unison with a social point of view, for patients on account of their domestic circumstances, often limit their stay to 14

days, and, as a general rule, to one of 21 days, rarely to one of 28 days.

Custom thus appears to have given a certain sanction to this article of medical faith, and one speaks with as much confidence and assurance of a favourable result derivable from 14, 21, or 28 baths as being *necessary* and indeed *sufficient*. Nevertheless it must be denied that there is any truth in the sacred number 21. Observation, apart from prejudice, has not established the fact that acute diseases run a weekly or semi-weekly course. The laws which, as regards the body, may perhaps here play a certain part are not yet thoroughly ascertained. How then can one expect within a period so limited a termination to long standing and deeply seated diseases, such as almost alone found at watering-places, even if feverish disorders, according to the nature of the case, only require a few weeks in which to run their course.

The result alone determines the length of the stay at the watering-place; but there is also the question as to how this result is to be measured. Not only must the subjective pains have disappeared, but *there must be no trace of the morbid lesion objectively discoverable*. The proof of this is tolerably easy when the derangement is accessible from the exterior. Nevertheless it appears advisable not to terminate the treatment too early after this has been ascertained, just as if everything morbid were thoroughly extirpated. Every slight residue that may happen to remain, is capable of occasioning a relapse. In the second place too, the general state of health must be completely re-established, inasmuch as on it the power of withstanding injurious influences essentially depends. For slight disorders a week's application of the water is often sufficient, but on the other hand there are articular affections and the like, which require months before they can be eradicated.

It must however be regarded as a good sign of the efficacy of the Wiesbaden waters that 3 *weeks* have rightly come to be considered *as the average duration of a course*. At least I have not found any longer period in use amongst my patients, and this is confirmed by the bath-superintendents, who are

competent judges in this matter, so that I cannot agree with MÜLLER'S opinion, published in a local journal, that 28 baths are the number most frequently taken. At other watering places visited by patients with diseases similar to those for which Wiesbaden is resorted to, much more correct rules prevail in this respect. Recovery is not demanded after 21 baths but after 60 or 80. In every week that the treatment is prolonged, the local changes disappear more rapidly than at its commencement, hence experience most strikingly supports the scientific demand for an adhibition fully and perfectly carried out. In this way how much trouble would be saved to the patient afterwards, how many a repetition of the stay at the watering-place would be avoided!

If individual and economical circumstances are once taken as the measure for the length of the water-treatment, then the patient will not persist in taking 21 baths in 3 weeks, but he will only drink and bathe so long as a good result appears probable; he will therefore, if a more frequent intermittence be advantageous, rather take 18 or 16 baths than that the effect of the water may prove too injurious to the organism and that the only consolation remaining may lie in the hope of a favourable consecutive result — which often nothing means than the failure of the exhibition.

Rules to be observed in and after the bath. — Whilst in the bath absolute immobility is not requisite; a moderate degree of motion such as that caused by gently washing the body with a sponge, is certainly permissible. Motion is rather to be avoided by those patients who are in an excited condition arising from pain or slow inflammation, and who therefore principally seek the baths on account of the calming influence of the water. One thing is always to be adhered to, viz. that the effect of the bath be sedative. It is only seldom necessary to keep the head particularly cool by applying cold cloths, &c.; to submerge the head is not good, because the hair dries with difficulty and thereby gives occasion to taking cold.

At Wiesbaden it has become the custom to go to bed again after the bath. This direction of the old physicians

must be considered a very wise one, viewed as regards the effect of the baths. Without being greatly fatigued, the patient often cannot remain longer in the bath than has been mentioned above, and at the same time the activity of the skin continually exposed to the water, might experience some injurious disturbance; therefore the quiet lying in bed now intervenes, which further prolongs the same tendency as that of the bath, if a proper amount of covering be observed, by calming the nervous system and the circulation. It is not, as we see, the intention to produce perspiration, an idea cherished by a preconceived opinion, but one which, from the explanation already given concerning the mode of action of the baths, must be set aside as unfounded.

In serious diseases, it is not sufficient to lie down on a sofa, but it is necessary to remain in bed, as in the night, if the full calming effect of the bath is aimed at. It is but seldom that excitement, palpitation, &c., are caused by the recumbent position, but if they do occur, the posture must be confined to a sitting one.

The patient easily equalises the difference between the cool bed and the warm bath by a few gentle movements, should his disease permit his doing so, and thus he averts any injurious effects.

The time for bathing is the morning, certain cases only excepted. The effect is neither increased or diminished whether the bath is taken fasting, whilst the stomach only contains a little mineral water drunk before hand, or from an hour and a half to two hours after breakfast. Here circumstances must decide the course to be adopted.

The patient would certainly act judiciously by resting a little after his morning walk and then having breakfast. The longer interval between that meal and dinner may too be advantageously employed in acquiring a good appetite. Then the bath would follow breakfast in about an hour and a half or two hours, that is, between 8 and 12 or 1 o'clock. But during the hot months the air in the bath-rooms, as they actually are arranged, becomes very warm towards noon, so that it is often difficult to take a moderately warm bath

except soon after drinking the water in the morning. In this case a short rest after the morning's walk must precede the bath.

Debilitated patients will often do well to bathe early, and observation teaches us that the bath suits them best when taken before their morning draught of water.

On the contrary should the baths in the height of the season be in great requisition and be taken especially early, this circumstance will occasion the choice of a later hour, until the patient can appropriate some other hour left vacant.

DOUCHES.

The powerful influence exercised by douches upon the body forbids us to trifle with them, and even to attempt their application, when the disorder remains obstinately unchanged. In this case, there are principally two questions: Is the Wiesbaden water really indicated? or, has the mode of applying the douche hitherto not been the correct one? The adhibition then more frequently suffers from excessive zeal and haste than makes reasonable progress. Great caution is accordingly requisite before in such cases a doubtful, although strong, proceeding is brought into action.

Water of the temperature of the bath is generally employed. The bath is first completely finished and then the douche is applied.

The *force* of the jet is the capital point to be determined. The douche must be strong and must redden the skin more or less, whenever irritation is to be produced, especially when there are painless deposits in the external parts. All the douche apparatus at Wiesbaden are thoroughly adapted to this purpose, and they can be made to throw a thick or thin stream of water as may be required.

In other cases, especially in nervous disorders, where a gentle excitement of the nervous system is the principal thing, a much weaker stream is necessary than the ordinary douches may supply, for neither the skin must be reddened nor the spot, towards which the douche is directed, become

painful. This can at least be effected by the rain-douche, and it would be necessary affixing to the apparatus a peculiar arrangement, which makes its application independent of every other contrivance. A moderate effect is in some measure to be obtained by directing the stream in a slanting direction upon the part, so that it falls *sideways* upon the skin, or the stream may be broken and divided by putting the thumb on the orifice and placing the patient at a distance from the mouth of the tube.

The *duration* of the douche is from 5 to 8 minutes, or shorter when only slight irritation is required. A daily use is not generally necessary, and is indeed almost impracticable: the skin excited by a strong douche, cannot recover itself so quickly, and the irritation of the part acted upon must always have *subsided*, before a new application can take place. Therefore after every douche it is highly necessary to indulge the body with a longer rest, than that called for after the ordinary bath, especially if the douches awaken any remains of pain.

Irritation of the skin by means of *friction with flesh-brushes* is also in use at Wiesbaden. Whether the skin and its sensitive nerves are irritated in a suitable manner by this means, still remains a question. I have never seen any strikingly beneficial results. Certainly this proceeding must not be employed with a dim idea of the nature of the diseases. When there are nervous pains it is often injurious.

In concluding our instructions concerning the mode of using the Wiesbaden waters, the remark is not to be withheld, that to the physician's directions must be left the determination of many a point that could not find mention in this work, and which indeed can only arise in special cases. A glance at the remarks about the nature and complications of the diseases from the present standing point of medical science, will soon convince the laity that a successful application of the mineral waters presupposes profound knowledge. Mistakes even amongst the initiated do not lie beyond

the reach of possibility. With the mere experience, for example, that Wiesbaden proves very efficacious against rheumatism, one has scarcely touched the surface of the subject as regards clearly comprehending the relation of morbid states to the action of the mineral waters. Whoever directs his treatment by an impression so superficial, must not complain at the end of the adhibition about disappointed hopes.

As regards the incidents that may arise here and there, the general medical rule, that every direction is good only for the actual morbid state, but is not to be applied to unexpected events, will guard against many injurious effects. Under such circumstances the consideration is always required whether drinking the waters as well as bathing be continued.

MANNER OF LIFE AND DIET.

There is nothing more important for the patient during the whole time of the stay than care in his manner of life. Of course the preponderating question is that concerning tedious chronic disorders, to which the body itself is powerless to give a happy turn, and whose cure is far more difficult than that of acute diseases in which the organs, being rapidly deranged whilst in full activity, are yet able to rouse themselves in order to re-establish their equilibrium. In this respect the co-operation of the body in chronic disorders is not so unconditionally certain, and even a slight influence may render it doubtful. *The success of the cure therefore depends above all upon the thoroughly earnest will of the patient.* In all writings about watering-places, much stress has always been laid on the necessity of a suitable manner of life.

According to the well known inscription on the celebrated baths of Antoninus in ancient Rome: „*Curæ vacuus hunc adeas locum, ut morborum vacuus abire queas, non enim hic curatur qui curat*“, conscious acquiescence in the purpose of the water-treatment, free from all business, and not oppressed with any civic position, can alone insure a successful result to an undisturbed course. Even conscientiously bathing in and

drinking the waters will not effect recovery, if proper diet and manner of life, nay more, the recreations and amusements of the patient also do not accord with the end in view. The patient must attentively watch the progress of his improvement and with prudence but not anxiety seek to avoid everything that may hinder him on his road.

Arrangement of the manner of life.

The more regularly the entire manner of life during the exhibition of the water is arranged and carried out, the less likelihood will there be of disturbance arising.

The morning draught of the waters in some measure regulates the portioning out of the day. It is followed, as has already been mentioned, by breakfast or by the bath and the hour of rest afterwards.

The patient may spend the rest of the forenoon out of doors during fine weather in order to enjoy the fresh air; in unfavourable weather, or if he fears taking cold, he must remain more at home. Before dinner, at one o'clock or so, and at least an hour before the meal, another glass of the waters is, as a rule, again drunk, the patient meanwhile taking a turn in the shady walks of the gardens.

At what hour dinner is taken is of little consequence, custom being consulted. The warm midday hours are best spent in the open air and in the enjoyment of cheerful society. However, the prescribed routine must not be forgotten, and a walk must be taken before supper, which for the sake of the night's rest, must not be fixed at too late an hour; if the weather permit, a walk may also be taken after that meal.

Should the evening be devoted to recreation and amusement, it is incumbent upon the patient to avoid everything that may be injurious to him. Amongst other things, for instance, he must not stay out too late in the evening air, although at Wiesbaden during summer the air continues very mild till towards morning. Especially must the patient who bathes, and whose skin is always somewhat sensitive, guard himself from harm. The night air is not *in itself* injurious, it only becomes so when from its greater coolness

and humidity, from its great difference in temperature as compared with that of the day time, it may exercise an unfavourable influence; and this occurs the more easily when we, under such circumstances permit it to act upon us whilst sitting still, in which state the body is less capable of resistance to its influence, than when in motion.

The *night's rest* must not be sought at too late an hour. The obligation of appearing early at the Kochbrunnen the next morning, will already serve to remind the patient of this. The ancient axiom that the sleep before midnight is the most refreshing is probably grounded on the periodical changes in the body. Towards morning a brisk activity sets in in the internal parts of the body and in consequence of it a series of disorders and other accidents usually appear in the hours after midnight. Now should sleep coincide with the remission of organic movements of the body and with the later hours of the evening, no interruption will take place; towards morning, on the contrary, the new activity in the body may easily lead to some derangement. A sleep of seven hours duration suffices for the wants of an adult, or even one of six hours, if it be undisturbed; exhausted strength however requires more rest, as also does advanced age.

The procuring of quiet sleep is already to be looked upon as a principal rule on account of reparation. Indispensable is this interruption of the animal activity in all disorders of the nervous system, or wherever it plays an important part in other diseases: in neuralgia, affections of the spinal cord, rheumatic gout, in many cases of ordinary rheumatism, and in female disorders. It is only in sleep that reparation of the nervous system takes place, whilst other organs find an opportunity for it during ordinary repose. Therefore towards the hour of rest every cause of excitement is to be carefully avoided; not only must supper be taken early but it must necessarily be light; even the influence of a bath in the evening may be useful for this purpose.

Should a too warm bedroom hinder refreshing sleep, at night one need not fear ventilation at Wiesbaden during the height of the summer.

It is to the patient's advantage to have a correct idea concerning the tendency and benefit of the *regular exercise* during his walks in the morning before his second and ante-prandial glass of water and during the evening. A few words may therefore be specially devoted to this subject.

By the consumption of organic substance and of strength producing material to which regular exercise forces the body, it powerfully stimulates the appetite. It therefore conduces, combined with the beneficial influence of a constant supply of fresh air acting upon the blood, to an energetic renovation and restoration of the body. For curing many chronic disorders, especially of the nervous system, that seek for help at Wiesbaden, a methodical mode of exercise stands in the front rank amongst medical appliances. Mere walking about the Trinkhalle, the avenues and gardens, however extensive the latter may be, or in the streets, is certainly not meant here; it is only walks in the woods and open country that fulfil this purpose. Opportunity for such walks is abundantly offered in the immediate vicinity of Wiesbaden by means of the well kept footpaths, which lead into woods clothed in the richest foliage and to points affording magnificent views. Considerations about pleasure and amusement here justly hold a subordinate place. Above all, exercise ought not to suffer any encroachment on their account. For this reason, patients will do well to choose as companions in their walks those only who have a similar end in view. Here also bad example destroys good resolutions. A wise discretion is no less required as regards longer excursions into the surrounding country, because they may easily conduce to excitement and too great fatigue; they should always be made either at the beginning or the end of the stay at Wiesbaden.

According to the peculiar circumstances of the patient, the walks may at one time be shorter, at another, longer; they ought naturally to be extended gradually and methodically, in order not to exhaust the strength at the beginning, especially as the unaccustomed mode of life required by the exhibition of the water easily calls forth a feeling of weakness. However the patient must not be afraid of doing too

much in this respect, if he really wishes to attain his end. The first feeling of fatigue quickly disappears and must be overcome. It is only necessary to know its harmless nature in order to appreciate the very worth of it.

When irritation of the joints is present, exercise ought at first to be moderate, and only increased when retrogressive transformation has made some progress. Nervous pains are not exasperated in the same manner by exercise, they often even become better, and the ensuing fatigue here does very little damage. Lastly, women ought to be careful about rest towards the period of their being unwell.

To guard against taking fresh cold is a rule of great importance that cannot be overstepped as regards the manner of life, especially with reference to the very numerous patients who swarm to Wiesbaden, tormented with remains of rheumatic sufferings or with nervous pains, which are easily awakened by taking cold. Besides the exaggeration of the mode of treatment, particularly of the baths, which certainly gives occasion to relapse from taking cold, it is this last which most frequently frustrates the result. The part still affected is all too easily thrown into increased irritation. It is not sufficient to be cautious about warm clothing, effeminacy in this respect is just the most efficacious means of injuring one's self.

Opportunities of taking fresh cold are by no means seldom presented to the patient. If there is cold rainy weather in summer, especially during its first half, it is felt more than in the days of autumn, which become gradually cooler. Cold evenings are particularly dangerous to patients sitting out in the open air. On a sudden change of weather, should a cold wind be blowing in the morning, one need not hesitate to postpone until after breakfast the usual routine which has hitherto been got through early; the bath can then be taken before. If the patient after bathing, instead of seeking his bed, lies down upon a sofa without the necessary covering on him, he is not safe from taking cold. Women are more sensitive whilst unwell than at other times. Short excursions by the railway also often give occasion to taking cold.

A little attention will easily protect from injury; yet here also precaution and not anxiety must be the watchword.

Diet.

The use of the water and the treatment of chronic disease in general demand strong nourishment. The usually increased need for alimentary supplies in consequence of the influence exercised upon the digestion by the water taken inwardly, and of the organic exchange wrought by the baths, also the effect of the greatly altered mode of life during the stay here, as well as the great care required to promote recovery and to ensure restoration, are the principal guides for regulating the diet. Even to patients afflicted with true gout, there is certainly no danger in adhering to a nourishing diet, provided it be a simple one. *The danger of a mistake in diet* does not consist in the supply of materials which may furnish a powerful organic reparation, but in the real *overburdening of the digestion*, if it be only in relation to a temporarily unsatisfactory state of the stomach, or in a too *mixed composition of the food*, especially of such, as really only gratifies the sense of taste.

No less important, but rather of greater consideration is it, for the patient *to take his meals at regular intervals from each other*. According to exact experiments the quantity of food taken at moderate meal requires 4 or even 5 hours before the work of digestion is completed. But then the stomach is for an hour afterwards in a certain unhealthy condition, which may be compared to superficial catarrh (BEAUMONT). During this time the stomach is certainly not yet capable of digesting naturally and efficiently, nor moreover is the gastric juice, which owes its origin to a preceding organic proceeding, prepared during the functional activity of the stomach. That the gastric juice, the proper solvent agent in the digestive process, is really formed in the interval is indeed not yet proved, but the information given by CL. BERNARD in his classical work on the function of the salivary glands, certainly points to this view. Only whilst at rest do these glands secrete the salivary fluid, and

for this purpose they use the oxygen of the blood, so that the venous blood issuing from them appears quite dark. During the time that the mouth is employed in mastication, the blood on the contrary remains bright red, because now whilst the already formed saliva is being poured forth, a more rapid circulation of the blood through the glands takes place.

It is only in 5 to 6 hours after a meal that the stomach is again found to be in a really healthy condition. On this ground can the fresh reception of food so early and frequently as is often prescribed, be defended? Every book on Physiology teaches in the chapter on Digestion that such advice is misplaced and shows but little wisdom. The stomach after each discharge of its functions must also rest for some time, just as the muscles, falling into an unhealthy condition by exercise, expressed by the sense of fatigue, and which disappears again only during repose, cannot continue in motion continually.

Some morbid conditions of a special nature may require food to be taken more frequently; as certain diseases of the stomach, days immediately succeeding severe illnesses, &c. But always in such cases, it is only a small quantity of nourishment that can be taken at a time. Patients with chronic ulceration of the stomach must also in Wiesbaden proceed in the same manner. In reality therefore the above-cited direction for taking food forms an exception to the general rule: *only to eat at proportionally longer intervals, and then in sufficient but not excessive quantity.* And whilst the healthy man has certainly to take care not to injure himself, in case he deviates a little from rule, although he would preserve his health incomparably better by adhering to the strict laws of nutrition, the invalid must, especially in *chronic disorders* and when it is a question of *reparation*, always strictly obey those laws, unless the disease authorise an exception. Of course, this rule is the more to be followed, when the organs of digestion themselves suffer or, as so often happens in chronic diseases, when they are at least sympathetically affected, because then their activity is not so great.

Three meals a day are sufficient. „Eating much is mere habit“, said STIEBEL in his pregnant manner. How beneficially, and often surprisingly so, a regulated diet and not too frequent meals, work upon nutrition and development, is not seldom seen in young persons, who after leaving their own homes are placed under new conditions and are subjected to strictly limited fare, which may be even less nutritious than their former food. Frequent eating must chiefly be avoided by those who have a tendency to stoutness; this custom is in general a principal source of weakness in the constitution and of manifold disorders.

General considerations concerning the food taken at the different meals. — The patient may take breakfast as usual. A more substantial composition of this meal is however often very advantageous in order to satisfy the increased need of aliment and to compensate for the supper of the preceding evening, which on account of the night's rest, will not have been arranged on too liberal a scale. In all cases of irritation, such as chest diseases, nervous disorders, and the like, it is judicious to replace coffee and tea by milk and such like non-exciting beverages, even only at the beginning of the treatment.

With reference to the principal meal at mid-day, the dietetic direction already given, to avoid overloading the stomach and not to eat of too many and too composite dishes will prevent patients from missing the proper road. The condition of the digestion occupies the front rank as regards the rule for dinner, and above all, digestion must not be rendered difficult nor must any disturbance of the abdominal organs, diarrhœa for instance, be generated. Daily experience teaches us that nutrition suffers severe injury by such a disturbance; even the internal use of the waters may have to be interrupted. The diet must be a thoroughly strict one, when a serious disease is in question; and of course this is the more necessary, if the abdominal organs are sensitive and have any tendency to diarrhœa.

As regards the choice of food, the use of the mineral water does not demand any precautionary measures beyond

the ordinary rules for living. Neither is its effect disturbed by varied food. The current and rigid directions, which fill up a long chapter in writings on watering-places, were compiled at a time when the waters were given in essentially purgative doses. Therefore it was not allowed to eat fruit, salad, cakes, &c. But in later times, now that milder treatment, more in accordance with rational principles, begins to make its way, the dietetic rules may be divested of their exceeding strictness and may even make concessions to the amusements, which are allowed by a rational mode of life, provided only it does not escape the physician's notice that the disorders generally require more careful considerations in other points of the regime.

For those patients living in superfluity and luxury there may well be great value in a rigorous plan of diet, which pretends that every disobedience to its command will be revenged afterwards in the consequences of the water-treatment. For allaying their numerous complaints accompanied by abdominal disturbances, for changing their enfeebled constitution, their nervous weakness and want of energy, there is truly need of the command: In the sweat of thy brow shalt thou earn thy health! But after deducting such exceptional patients, for whom every physician may depict what horrors he likes, one certainly attains one's end by more humane rules and by the rational advice already given. No special advantage can arise from enumerating in a great scale forbidden dishes along with those permitted. In doubtful cases the patient will always do best in deciding against any particular article of food; and then afterwards appealing to someone else's better judgment. The greater is the patient's merit, when he withstands temptation and exercises temperance even at a richly furnished table. In such a situation he must especially adhere to strong meats and postpone everything that serves for mere enjoyment and gratification of the palate to the time of health, in order to use all his efforts in attaining that greatest of blessings.

In concluding our remarks upon dinner we must glance at certain articles of food in the class of *means of cheer-*

fulness and also to *beverages* belonging to the same category, on account of the many incorrect ideas which prevail concerning them in the non-medical world, and which may exercise a prejudicial influence upon the treatment.

According to the extended researches of FRESSENIUS, fruit is certainly one of the least nutritious articles of diet. Not on this ground alone, is it wrong to consider fruit in ordinary life as fitting food for invalids; its faculty, similar to that of real laxatives, in causing alvine evacuations, must convince us of the difficulty of digesting it. An imprudent use of it may come into collision with the treatment. Sweet things and pastry interfere with digestion by the formation of masses difficult to be dissolved. Cream-ices often act injuriously by their coldness and in conjunction with other frigid things such as iced water, cold beer, &c. most frequently give rise during the application of the mineral water to disturbances of the digestion by mistakes in diet.

The wide-spread habit of *taking coffee in the afternoon* may work no injury to a healthy person endowed with a strong digestion, and may even be beneficial to one who has just quitted an abundantly spread table, for coffee by means of its theine in conjunction with the empyreumatic substance from the ethereal oil and the tannin which it contains, checks digestion, as well as all fermentation; it may therefore prevent the latter from being carried too far. The opposite opinion that coffee favours digestion rests upon a mistake as to its laxative influence.

Spirituous drinks, having no strengthening property in themselves as is generally thought, but being stimulating from their immediate and essential effect, produce an agreeable and exhilarating feeling when taken in moderation. Used in this manner they do not impair the favourable effect of the mineral water, and often even assist recovery. The patient's own experience will protect him from injury in this respect. At the time of being unwell, women must avoid all stimulating things.

With regard to fluids generally, it must chiefly be remembered, that when taken in large quantities they quickly

eliminate from the system the salts that have been imbibed with the mineral water, and they may therefore limit the scope of the result.

Supper must be essentially ordered with a view to sleep. Should the latter be easily disturbed, supper must be early and very moderate; a sound sleeper may allow himself more liberty.

If all the rules that have been laid down in these outlines concerning the exhibition are carried out strictly and judiciously, being neither exceeded in one direction nor fallen short of in another, and if one proceeds the more attentively in proportion to the gravity of the disease, to the accompanying state of irritation, and to the weakened and sensitive condition of the patient; then disturbing accidents will without doubt seldom occur and the treatment will be crowned by a successful result. In a few weeks the patient will then have attained an object, which without such precaution cannot be reached in a much longer space of time. But under all circumstances the invalid must perceive that in a simple, moderate, and regular life, lies the only foundation for promoting and preserving health, as well as the surest way of subduing disease.

Conduct after the exhibition of the mineral water. — The conduct of the patient immediately after the course is of the highest importance as regards assuring the permanence of the success that has been achieved. Mindful of the pain caused by the disease and of the difficulty of curing him, the convalescent must, according to the nature and gravity of his former illness, arrange his mode of life for a series of weeks in a manner quite similar to that followed during his sojourn here. Whoever, after the exclusive care for his health and after all the restraints imposed by the use of the mineral waters, again plunges into the turmoil of his profession and of domestic life, abandons himself to amusements and enjoyments

without stint, and neither avoids excitement nor exhaustion, nor taking cold, can only blame himself, if the good wrought by the mineral water again vanishes in his hands. It is not Karlsbad alone that revenges itself on the invalid, who deviates from the proper course; after a stay at any watering-place soever the subsequent time must be spent cautiously, if the favourable effect of the treatment on the organism is not to be brought into question, if the quiet progress in strengthening the recovery that has been attained, is not to experience a check, and if even the general convalescence is not to retrograde.

Should other treatment afterwards be deemed desirable, it is not to be entered upon at once and unreflectingly. The use of sea-bathing, for instance, immediately after the preceding warm baths, has often recalled many rheumatic or nervous disorder.

SUPPLEMENT.

Season. — Preparations and Arrangements for it.

The proper *season for the use of the waters* is from May to the end of September, and very often from the temperature of the locality, April is suitable for a residence in Wiesbaden: moreover the generally fine month of October frequently permits a successful application in autumn.

Women will spare themselves troublesome interruptions and will reside here with greater benefit, if they arrive after the termination of the catamenia or immediately before its commencement, in case they have a long journey to undertake.

In all German watering-places it is only in the height of summer, July and August, that one can with certainty reckon upon continuously warm weather, free from sudden interruptions, so that light clothing alone suffices. In the other months prudence advises us to take into consideration the necessity of better protective clothing.

As companion during the stay, however necessary it may be to have sympathizing nursing and whilst separated from home not to be in want of cheerful society, one must only choose such a relative as requires no attention, and such as by his conduct will not disturb the quiet routine of the treatment. By such prejudicial influences the good effect, which may have been begun prosperously, is often frustrated.

Residence at Wiesbaden.

The 28 bath-houses, containing 798 baths, and a very considerable number of furnished rooms, enable the town to receive a multitude of visitors. Many of the bath-houses are at the same time hotels, and besides them there are in the neighbourhood of the springs, as well as in other parts of the town, hotels without baths, some of them with extensive suites of rooms, and a yearly increasing number of private lodgings.

A bath-house is certainly to be preferred by those patients who require consistent treatment, and by such as move about with difficulty or are sensitive to cold. In those years in which unfavourable weather prevails, a residence in a bath-house likewise appears preferable. For slight complaints and in warm summers the advantages of a bath-house are not so apparent. Yet the neighbourhood of the springs is at least to be sought when bathing forms the principal feature in the water-treatment. Patients with exhausted strength or nervous diseases, who are sadly in need of recovery, should always, even in the bath-houses choose roomy, and airy apartments.