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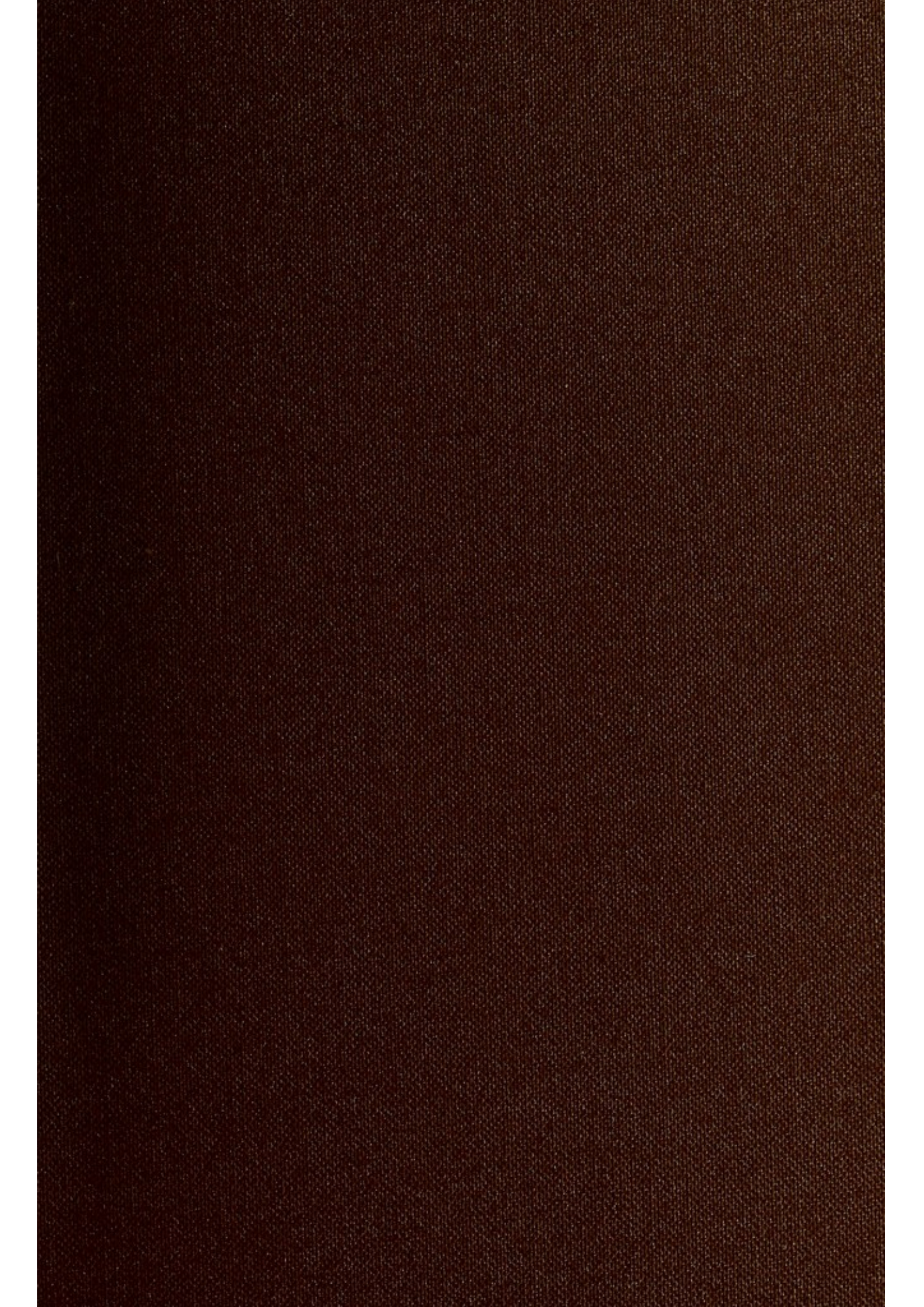
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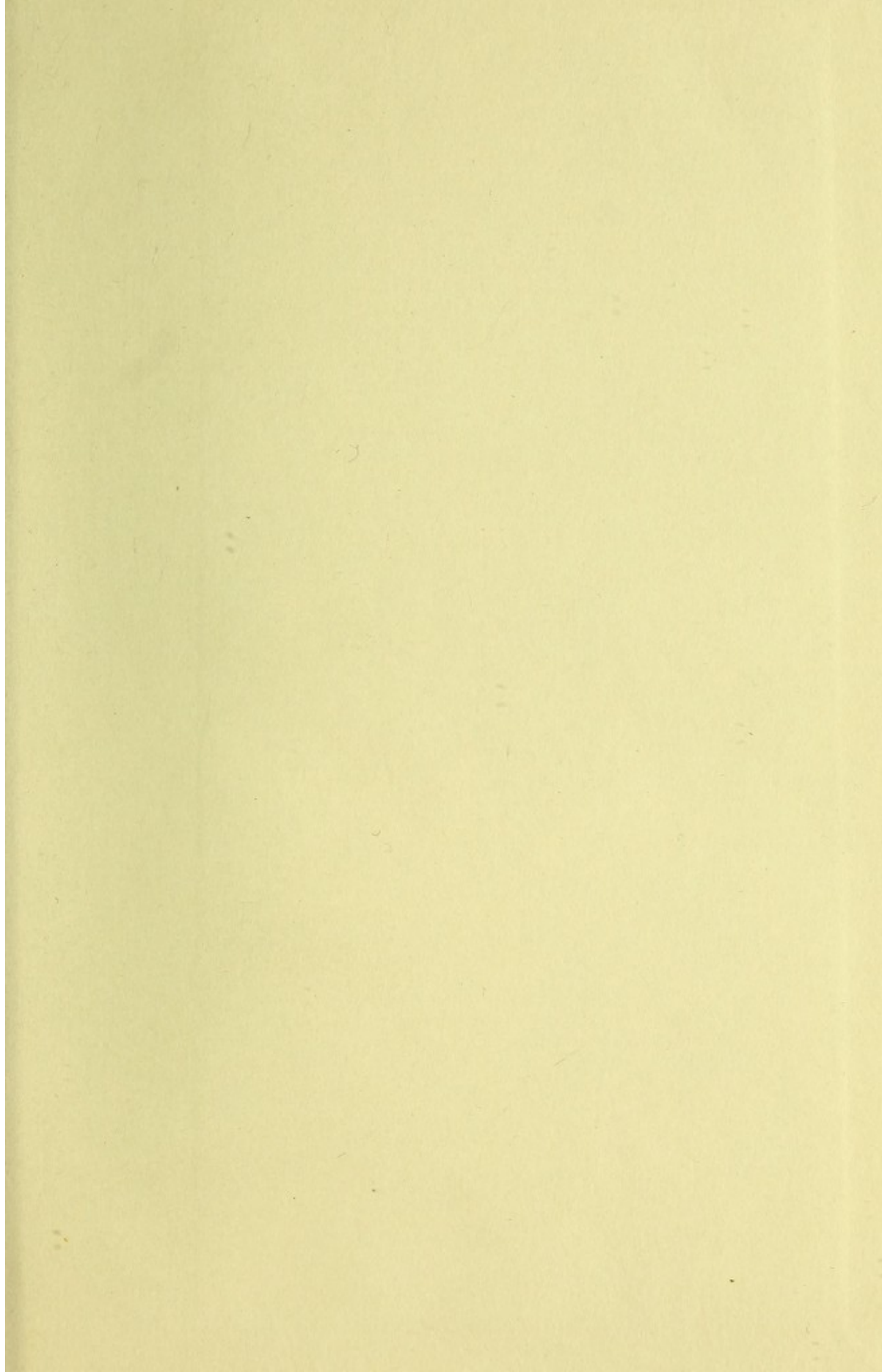


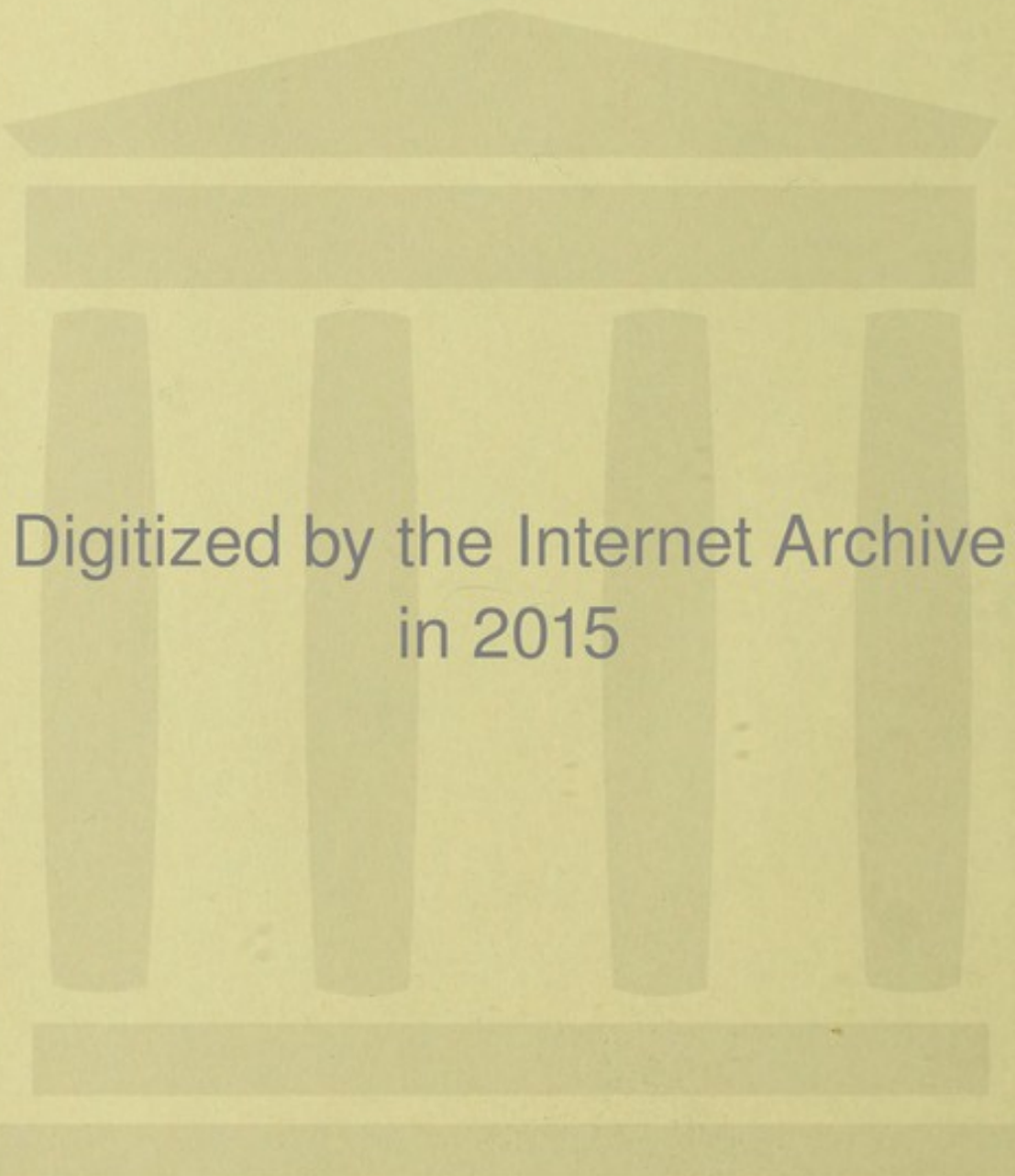
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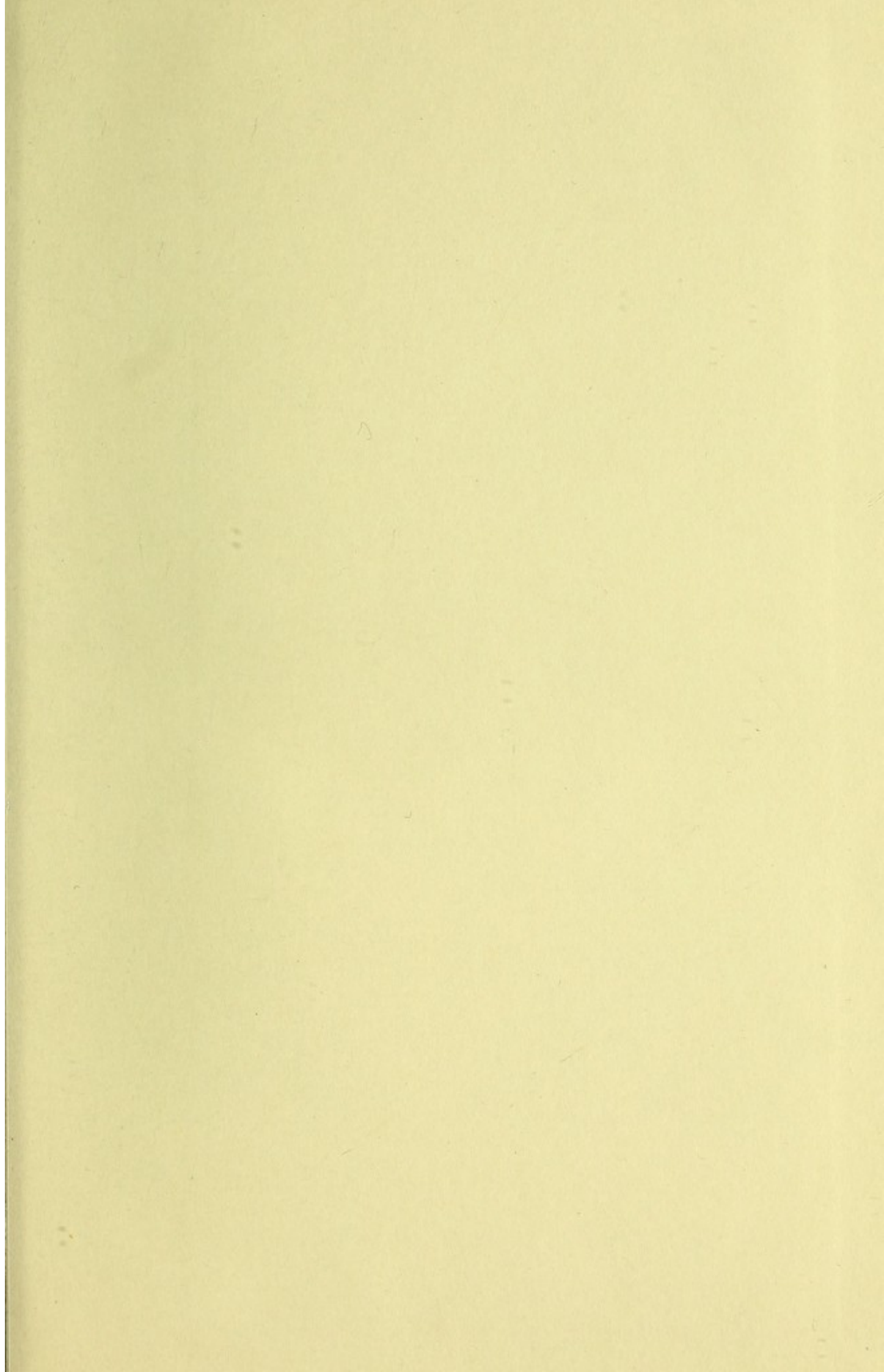
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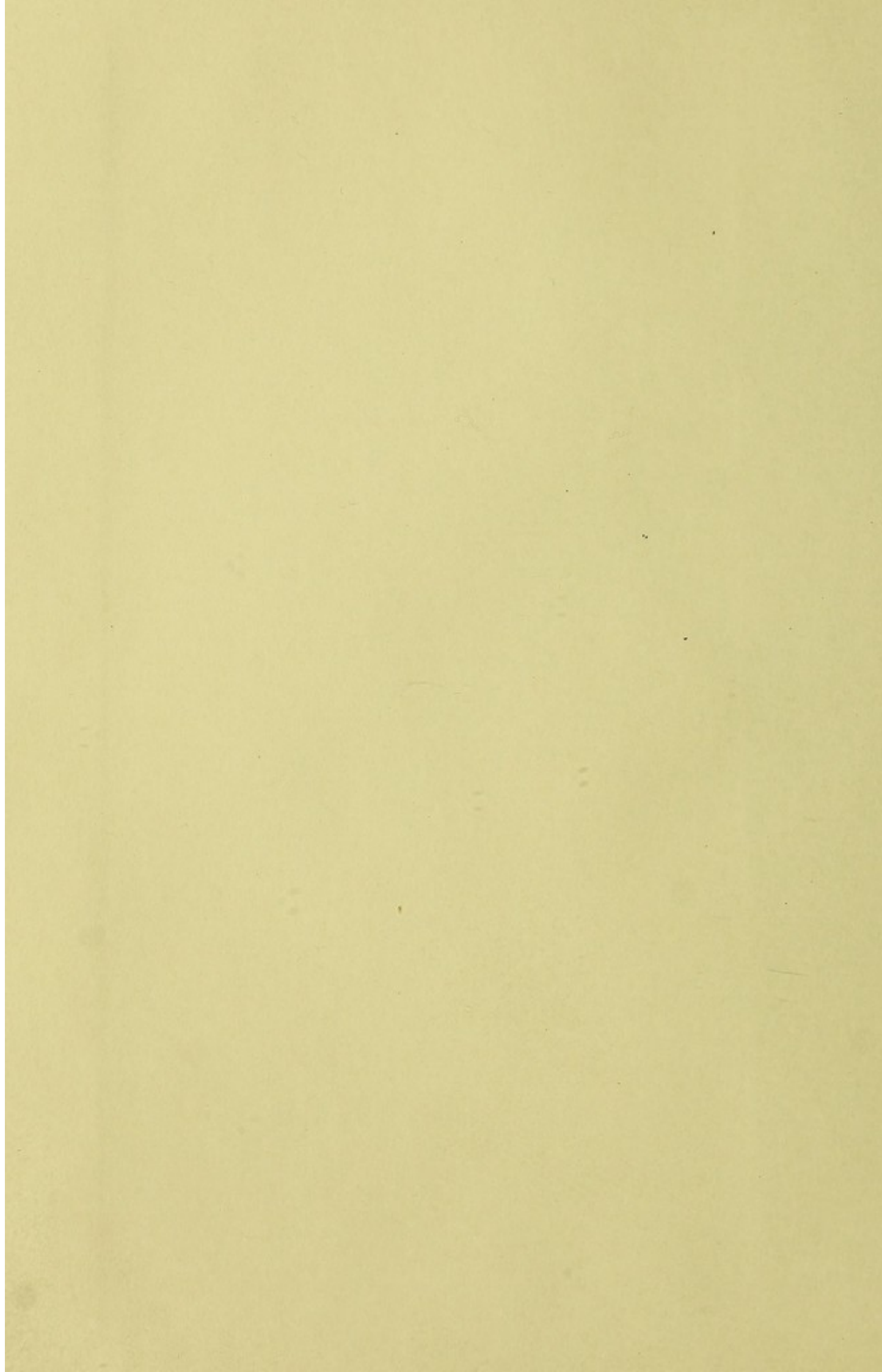


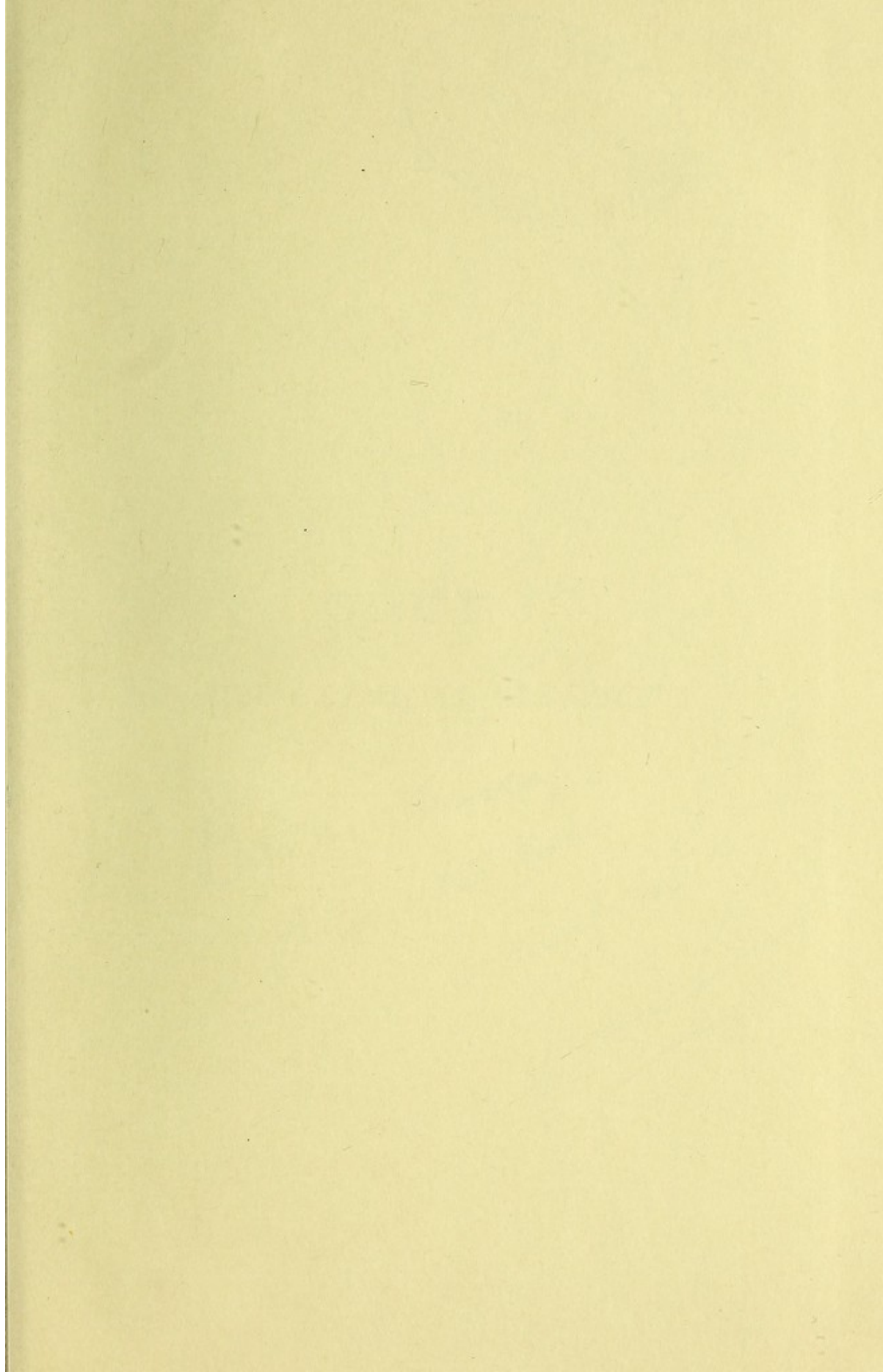


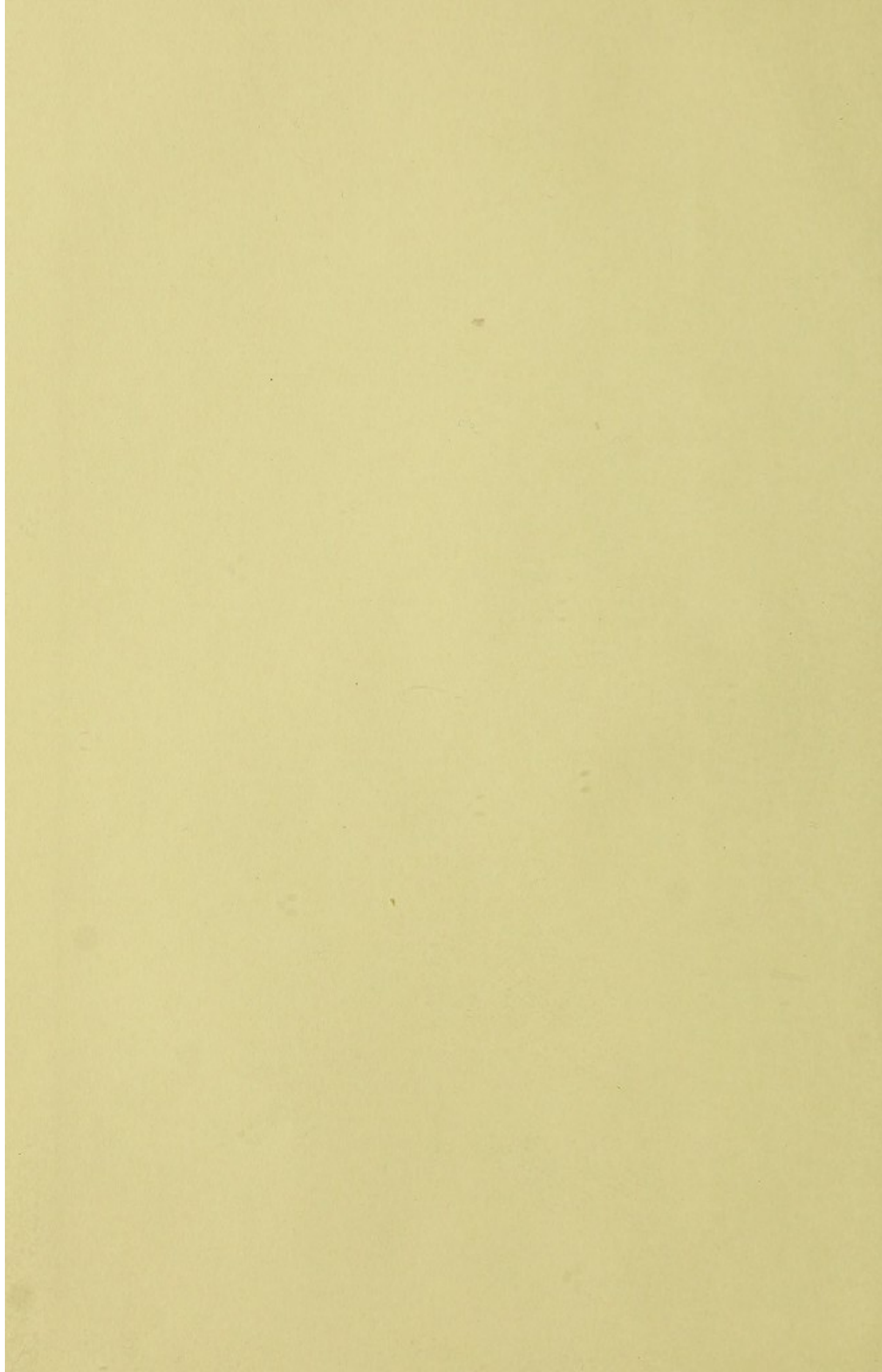
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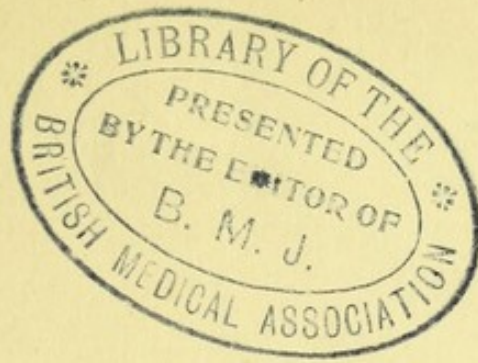
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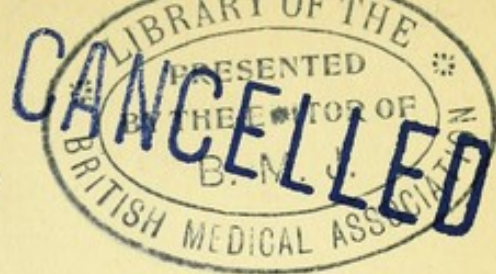
GOUT

IN ITS CLINICAL ASPECTS

Read many
slips of the pen
and a multitude
of misprints

1008

GOUT



IN ITS

CLINICAL ASPECTS

AN

*OUTLINE OF THE DISEASE AND ITS TREATMENT
FOR PRACTITIONERS*

PART I.—FACTS AND INDICATIONS

PART II.—TREATMENT AND FORMULÆ

BY

J. MORTIMER GRANVILLE, M.D.

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MEM. CORR. ÉTRANGER SOCIÉTÉ CLINIQUE DE PARIS

Αιτιήν δε ατρεχεα μεν ισασι μουνι θεοι, εοικυίαν δε ανθρωποι.—ARETEUS



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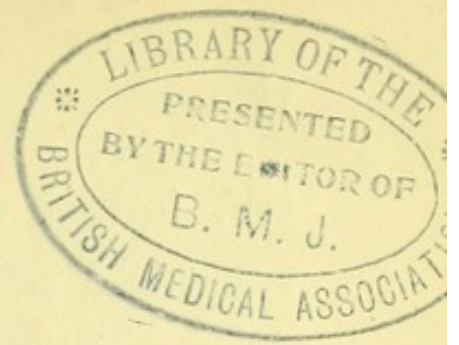
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PREFACE.



THIS little work makes no claim to the credit of a scholarly Treatise on Gout, such as the profession long ago received from the pen of one of its most respected members, and which it justly esteems as the best book on Gout in our own, or probably any other, language. If it were not impossible that I could ask Professor Garrod to countenance the defects and gaucheries of my humble clinical monograph, I should have liked to mark my sense of the position which any writer on Gout must occupy in relation to his supreme mastery of the subject by asking him to accept the dedication of the following pages. As it is, I can only cherish the hope that when and where I have ventured to depart from the lines he has laid down, and even dared to differ from some of the opinions he has expressed, it may be understood that I have not taken either step recklessly or without that diffidence which must needs be felt by the mountain climber who hazards the danger of trying to find a path for him-

self, instead of dutifully following the lead of the recognized guide. I say this much in extenuation of an audacity of which I am conscious in offering the profession a new outline of the symptoms and treatment of Gout.

The present volume is the outcome of a desire to embody in a form convenient for reference a concise account of the leading symptoms and characteristics of a disease which, so far as I may presume to judge, appears to be extending its ravages and becoming more complex in its manifestations year by year. It is now just thirty years since my attention was specially directed to the study of this disease by the late William Budd, to whose enterprise and industry in clinical and pathological research I owe more than any words of mine can acknowledge. Much that may strike the schoolman of to-day as old-fashioned in the views I take, has outlived in my mind the changes of a revolutionary epoch in science (for I am a Tory in Science as in Politics); while not a few of the novelties which I find engrossing the notice and stirring the enthusiasm of the present generation of students and young practitioners seem to me quite old. "*Omnia mutantur et nos mutamur in illis,*" cried Lotharius Primus. All the same, those who resist the allurements of Fashion in medicine, as in

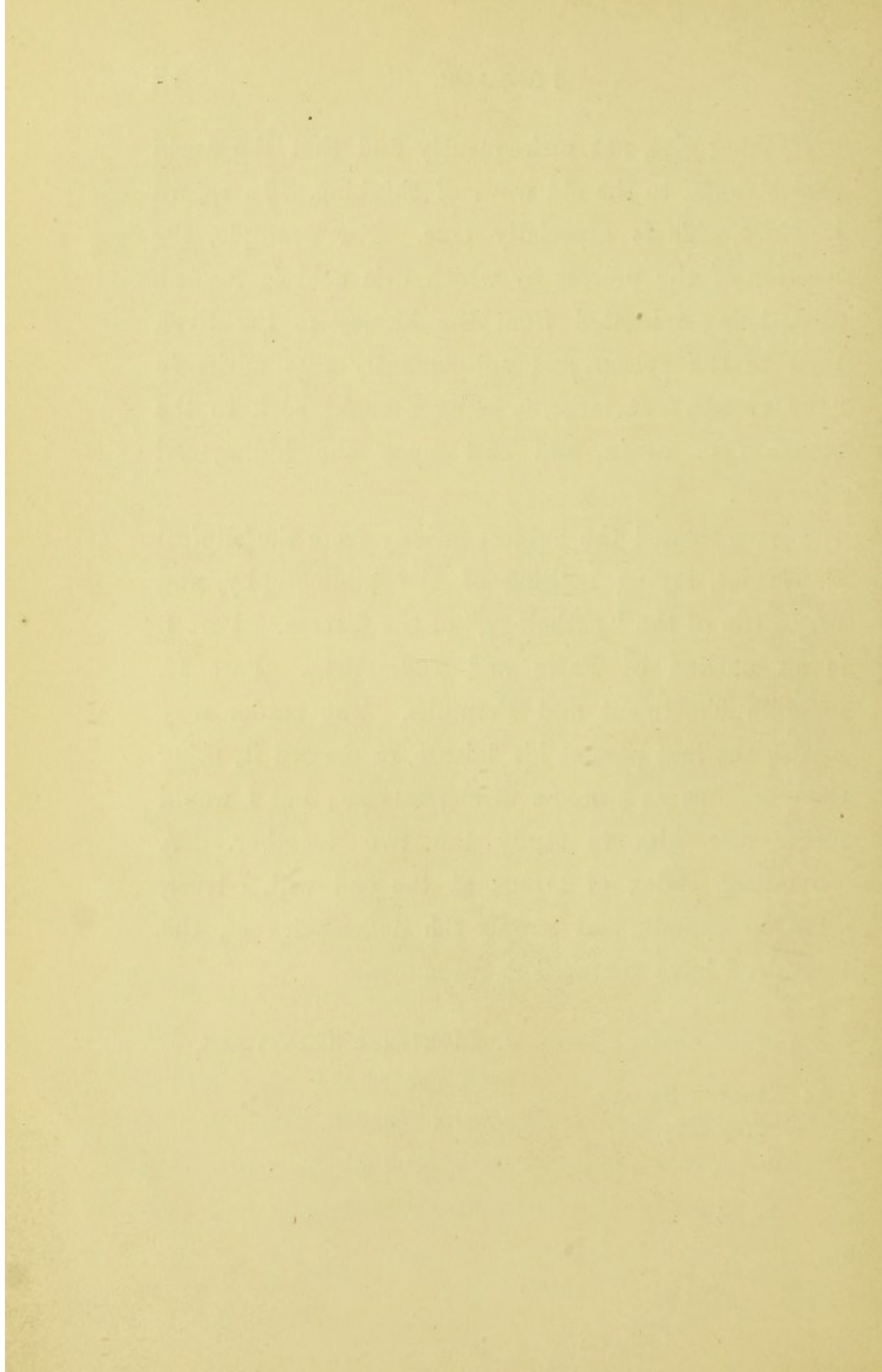
everything else, not unfrequently find that the world comes round to the old ways of thinking. In regard to Gout, this is especially true. For example, the location of the process by which uric acid is formed, after being relegated from the kidney to the liver, then to the spleen, and subsequently cast adrift in "the system" at large, is being brought back to the renal organ again, and cast upon the kidney-cell after all!

I have treated the subject strictly from the clinical standpoint, saying nothing of the bibliography, and very little of the "pathology," of the disease. Part I. is an outline of Facts and Indications. Part II. includes Treatment and Formulæ. The reader may peruse the first part at his leisure, or discard it, using the second as an epitome of suggestions; but I would rather ask him to study the two together. A Synoptical Index of Drugs at the end will, I trust, serve to explain, and supply the deficiencies of, the formulæ I have ventured to recommend.

J. MORTIMER GRANVILLE.

14 HANOVER SQUARE,

May 1885.



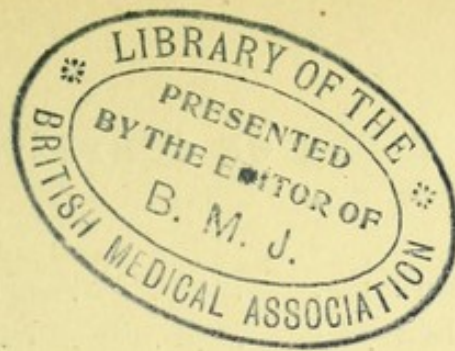


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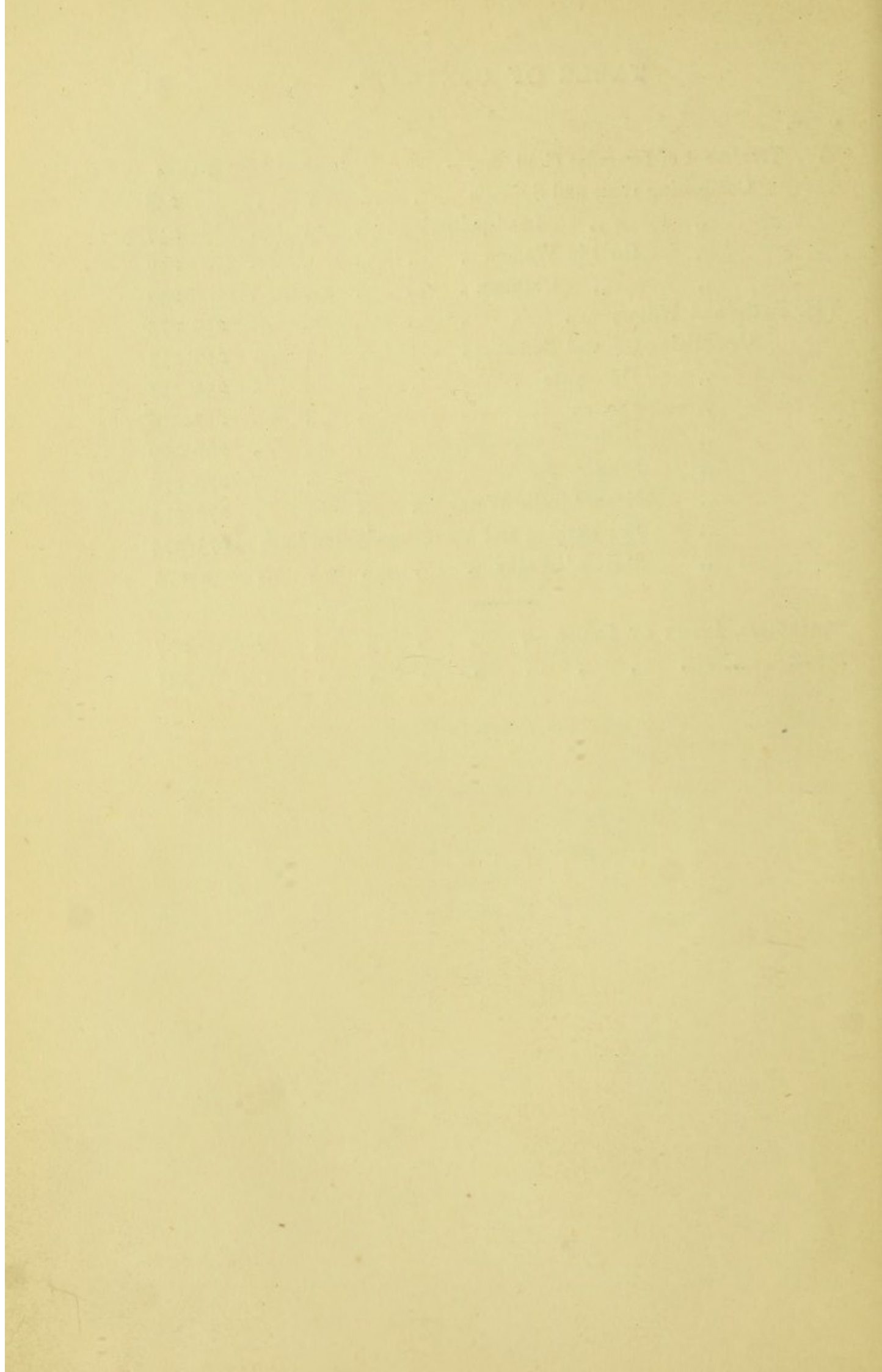
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PART I.

FACTS AND INDICATIONS.



GOUT:

IN ITS CLINICAL ASPECTS.



CHAPTER I.

WHAT IS GOUT?

THE discovery of an entirely satisfactory answer to this question is much to be desired. The search for one has been long and painstaking; and it is still in active progress, though as yet without much promise of success. Beyond speculative hypotheses, science has little to show for the enterprise of its explorers. Practically, we are compelled to fall back on that crude notion of the disease which gave it its name: the gout or *goutte*, because, as the dictionaries tell us, it was believed to be produced by the distillation of a liquid *goutte à goutte* on the part affected. As it happens, this primitive idea is as useful as any which has since been excogitated; and there would seem to be increasing probability that it actually embodies the germ of truth. The most recent researches, and advanced inferences from the anatomy of the disease, tend to show that, whatever may be its cause, the local—or localized—malady consists in the out-pouring, or exudation, of a

fluid, or semi-fluid, solution of uric acid or urate of sodium into the interstices of the tissues, where it first acts as an irritant, setting up more or less inflammation, and then tends to necrose the structures it invades. There is nothing to prove that the extruded material in gout has any specific local action. It irritates by its acidity, and perhaps erodes the tissues whose inter-spaces it occupies ; but its effects are principally mechanical, either blocking vessels and channels or so compressing them as to impede the circulation of blood or lymph. It presses upon or stretches nerves and nerve-sheaths, and it disorganizes, and destroys the texture of, tissues essential to the integrity of the parts it penetrates ; but there is no sufficient evidence to warrant the assertion that, apart from these accidents of its deposit, the exudative material of gout has anything in its constitution, or possesses any property, incompatible with the healthy performance of organic functions by the tissues it does not *mechanically* injure or destroy. This may appear to be a bold proposition, but I think it is one that ought to be laid down at the outset and kept clearly in view, albeit that the "uric acid diathesis" is in itself held to be a disease.

Whether or not it be the fact that the very presence of uric acid in the blood constitutes a morbid state—involving the re-absorption of a kidney-product—the physiology of the subject undoubtedly points to the conclusion that uric acid is an excrement. We may go one step farther, and affirm that in man it ought not to be discoverable in large quantity anywhere within the boundaries of the organism, and nowhere in a crystalline form.

In brief, uric acid has no place in the healthy body, except it be in the liver, where—if it be not a kidney-product—it is either formed or destroyed. We must not attempt to decide which, because, as Dr. Pavy has demonstrated in regard to sugar, the bare fact that a substance is found in an organ does not prove that it is produced therein; it may have been brought there to be destroyed. In any case, the liver would seem to be the organ proximately at fault in regard to the accumulation of uric acid. Either too much of this material is formed, or not enough is destroyed, by the liver; and as a consequence it accumulates, and is taken up by the blood, as sugar is introduced into the circulation in diabetes or bile in jaundice, or it is thrown back into the blood by the kidney. Of course it is possible that the fault is not so much with the liver or the kidney as with some other part of the organism. This may be true as regards both gout and diabetes, and, in a coarse way, as when a gall-stone blocks the common duct, in jaundice also. It is not, therefore, permissible to affirm that gout depends on an aberration of function in the kidney or the liver, though the facts and suggestions of the clinical history of the disease certainly point significantly to that possibility.

The presence of uric acid [$C_5H_4N_4O_3$] in the blood is always a source of peril, because it is ever prone to crystallize. In its pure state this acid requires from 14,000 to 15,000 times its volume of cold water, and 1,800 or 1,900 times its bulk of boiling water, to hold it in solution. Speaking broadly, we may say that, taking the temperature of the blood at from 100° to 107° Fah.,

any excess of one in about eight thousand parts will be likely to form, and, if the conditions are favourable, to deposit, crystals. It used to be thought, and has not been disproved, that "attacks" of gout are sometimes brought on in the gouty habit—that is, with an organism in which uric acid is present in excess in the blood—by the formation of crystals in the tubes of the kidney; but it is obvious that, although this may be one mode in which a paroxysm is produced, whenever a readily crystallizable substance is present in the blood, in result of accumulation whether by inordinate formation or by failure of destruction, there must be danger of local deposits at all points where the circulation is retarded, or where the temperature is low, as in the extremities. Another condition which will necessarily tend to the origination of an attack of gout in a gouty subject—that is, a person who labours under the uric-acid diathesis in one or other of its forms—is reduction in the solvent power of the fluid in which the uric acid is dissolved, either by special elements in its constitution or by mere increase of its density. Thus, if the fluids of the body should become particularly acid, or if the blood be notably deprived of its liquor—as by purgation—there is likely to be an attack. A careful consideration of these simple matters will often enable the practitioner to determine how an attack of the gout has been brought about, or how to avoid one, although he is not able to go deeper into the matter, and to determine in what the morbid cause of the malady consists.

If we could determine whether uric acid is a normal product of the disassimilative process, and only needs

further progressive oxydation to convert it successively into kreatin, kreatinin, and ultimately urea, as the chemists until recently assumed, or if it be an excrementitious substance *sui generis*, there would be a starting-point for the inquiry how to get rid of it, but no certainty of inference is at present practicable. It may be, as some think, that uric acid and urea are derived from different sources in the economy. And while this doubt exists, we cannot finally adopt or dismiss the hypothesis that Nature aims to rid the organism of uric acid when she causes it to be thrown out of the circulation into the interspaces of the tissues and by an inflammatory process, so to say, "burns it off." This was long an accepted, because fascinating, theory, but whether it had any foundation in fact cannot be decided.

All we can confidently affirm is that if uric acid be not closely related to urea, but formed in the kidney by the *vis metabolica* of the kidney cells, however interesting the study of the urine in gout may be, it is not a phase of the clinical subject on which so much stress can be reasonably laid as many of us have been wont to lay upon it even within the last few years. As a matter of simple clinical experience acquired by the daily examination of the urine in a fairly large number of cases of gout both during and between the paroxysms, I am driven to the conclusion that the proportion of urea [$\text{CO}(\text{NH}_2)_2$ or $\text{CH}_4\text{N}_2\text{O}$] in the urine does not bear nearly so constant a relation to the progress of the uric acid disease as until I made this matter the subject of close and continuous observation I had supposed it did. It is not the fact that the urea is always,

or generally, small in proportion when gouty symptoms are present, and that it increases when the gout subsides. On the contrary, I frequently find more urea passing off while the attacks are at their height and less in the intervals of illness. The clinical facts not less than the physiological, in relation to the excretion of urea, point to the conclusion that it does not stand in the relation to uric acid of a metamorphic product farther on the way out of the organism, but seems to be derived from a different source.

The local manifestations of "gout" are the consequences of the deposit of uric acid or its compounds; but the essential morbid state consists in the presence of this acid in the blood, either by its too rapid formation or by some defect in its destruction, and consequent accumulation, or by re-absorption in the kidney. It is impossible at present to go farther than this, on firm ground, in an inquiry as to the nature and cause of gout. Meanwhile, we are justified in assuming that whatever the real fault may be, and wherever it be located in the organism, it is certainly organic or structural. The proof of this is furnished by the fact that gout is hereditary. We know that, whether it be a trick of manner or a distinctive configuration of some feature or member of the body, which is repeated by the child after the parent, the physical peculiarity or habit must be due to an organic specialty of some kind, either coarse or fine, broadly structural or molecular. The so-called *transmission* of peculiarities is really reproduction in the child of "likeness" to the parent, in obedience to that law of "bringing forth after his kind" which governs the propagation and development

of every organism whether vegetable or animal, and which renders it possible to improve a stock by culture ; the good points gained in one generation being preserved, or reproduced, in the next, or in the next but one (atavism). The hereditary character of gout places beyond question the fact that it is an organic disease—that is, in the sense of being dependent upon some organic peculiarity which favours excess of production or defect of conversion or re-absorption of uric acid.

There are certain curious points which ought to be borne in mind, though it would be premature to use them constructively in the formation of any theory. Sooner or later, I believe the doctrine of evolution, interpreted by dissolution, will throw light on this disease as on most others ; but for the present we must be content to name the facts without even collating them. Some physiologists contend, paradoxically, that excessive flesh-feeding must be responsible for the accumulation of uric acid in gout, because there is, as they allege, a characteristic deficiency in the excretion of urea ! Surely the birds, reptiles, and insects, in whose excrement uric acid preponderates, are, in the main, flesh consumers, and they do not, as a rule, excrete urea at all. The majority of the herbivora discharge the products of disassimilation in the form of an acid that differs from the uric—namely, the hippuric [$C_9H_9NO_3$], which is itself a normal constituent of human urine, though in small quantity, being always found in the urine of children, and generally, though occasionally it is absent, in the urine of adults. Again, the supposition that uric acid is in excess because there is not enough oxygen to convert it into urea—a hypothesis founded on the fact

that urea can be artificially formed from uric acid by oxydation—is untenable, because, although uric acid is in excess in the excrement of reptiles, which consume little oxygen, it is present in still larger proportional quantities in the excrement of birds and insects, which consume considerably more. In short, the alternative preponderance of uric acid or urea in the urine does not appear to depend either on the character of the food or on the quantity of oxygen consumed. Speaking generally, I think it may be said that the more physically active, in an aggressive sense, the animal the larger is the proportion of urea and the smaller the proportion of uric acid in its urine. Thus, although birds, as a class, excrete uric acid, in the excrement of the rapacious birds urea is found, though not in such quantities as to be attributed to the nature of their food.

The notion that urea and uric acid with the urates, as they appear in human urine, are to be regarded as serial or progressive products of the disassimilation of nitrogenous elements of the food, and that the urea represents a higher degree of retrograde metamorphosis than uric acid and its compounds, is the cause of much confusion both in theory and practice. It is upon these hypotheses mainly that the prevailing method of treating gout by limitation of the flesh foods is founded. It is inexplicable to me that this policy should find favour with physicians who base their treatment of disease on physiological principles, seeing that there are good reasons for believing that much more depends on the changes which take place in the elements of the food

after digestion than upon their form when consumed. Thus leucin and glycocin, which abound in the albuminous, gelatinous, and other principles, and which may constitute the chief sources of the urea, are probably dependent upon the integrity of the liver function for their conversion into that product. If there be incapacitating disease of that organ the urea is replaced by leucin and tyrosin. When the conversion of leucin and glycocin into urea is effected the residue, perhaps, forms an alcohol which acts as food. May I venture to throw out a suggestion that uric acid is chiefly excreted by animals whose mode of life does not admit of a free use of the lung *as an excreting organ*, and in other animals under conditions which impair the efficiency of the apparatus of respiration in respect to that part of its function? It is, I think, of importance to mark the distinction I am trying to make. When and where there is either a great need for oxygen in the system for muscular purposes, or the quantity of oxygen obtainable by the lung is, relatively to the needs of the body, small, or the lung is wholly occupied with the interchange of oxygen and carbonic acid, uric or hippuric acid must be excreted. When and where there is a freer use of the lung, or the supply of oxygen readily attainable is in excess of the muscular requirements, urea is excreted and very little uric acid passes off by the kidney. Thus children, who are ever on the move and require a good deal of oxygen, always excrete hippuric acid, while it is not invariably found in the urine of adults. This is a speculative matter, but it will serve to emphasize the observations already made. The chemistry of the disassimilative and the excre-

tory processes in gout cannot be studied to any useful purpose apart from the chemistry of the digestive and assimilative processes, and these are necessarily much obscured and impaired by the disease. In short, the chemical phenomena of gout compose a vicious circle, and the practitioner who does not look outside that circle for the indications of his treatment can scarcely fail to be misled.

Of late attention has been increasingly directed to the nervous system in connection with gout as with most other maladies. This is so far satisfactory, because, after all, it is by nerve-force, whatever that may be, the whole business of life is carried on in the organism, and the nervous centres are the foci, if not the sources, of vital energy. The behaviour of the several centres—so far as we can localize nervous activities in gout during attacks of the disease and in the comparatively healthy intervals of the life of a gouty subject—promises to afford most useful and suggestive indications. This is a peculiarly rich province of inquiry, but it is, as yet, barely entered upon, and in no sense even explored, much less surveyed. The extent of our knowledge of the part the nervous system plays in other diseases which exhibit certain of their characteristic effects in the chemistry of the excretions—for example, diabetes—is surprisingly small; but of gout we know next to nothing. Perhaps the most remarkable feature is that to which I ventured to call attention some years ago—namely, that, as a rule, gout is commonly developed at the precise period of life at which the physical power of carrying into effect mental purposes begins to fail. This is conspicuously the case with men who have

led a habitually energetic life, either with muscle or brain. It would appear that the nervous system suffers from a sort of nightmare, with dreams of action, the executive part of the organism, whether brain or muscle, being unable to fulfil the behests of the higher faculty of volition; but of this I shall have more to say farther on.

To sum up. The best answer we can give to the question, What is "the gout"? I take to be this: It is a perversion of function in relation to the presence of uric acid in the blood, and this perversion of function is due to organic peculiarities, but whether the fault lies on what may be called the ingestive and constructive side of the process of nutrition [liver or spleen], or on the destructive and ejective side [kidney], has not yet been ascertained. It must be assumed that uric acid is in itself an excrementitious substance; but whether it be a product of nitrogenous materials which have not yet entered the general systemic circulation—being intercepted by the liver as they issue from the portal inlet—or of waste and débris which have passed through the blood and the organism and are on their way out, cannot at present be determined.

I incline to think, wherever uric acid may be formed, the liver is generally the organ that first fails in gout. Either it has too much to do, or its power is diminished, so that uric acid accumulates in this organ and is not eliminated from the blood. If it can be got rid of either by the kidneys or by a catarrh of the respiratory organs no great harm ensues, and the liver may recover itself; but if uric acid be not thus discharged, urates will be thrown out into

the interspaces of the tissues somewhere, and an attack of the malady with localized symptoms will occur. The nature of the attack will be determined by the condition out of which it arises. If there has been a sudden accumulation, or recent re-absorption, of uric acid, the illness is likely to be acute like an eruptive fever. If the accumulation has been of slower formation, the paroxysm may be subacute, or there may be no greater disturbance than is contingent upon the *goutte à goutte* of new material at the seat of old deposits, thus constituting the phenomena of chronic gout. Anything that disturbs the orderly working of the liver will tend to produce an attack of "the gout" in a gouty subject, even though the hereditary peculiarity that causes the disease may exist in the kidney cells; and, of course, lesions or excitations of the nervous system are peculiarly prone to bring about a paroxysm either by irritative or inhibitory interference. I do not, however, think the strong leaning of contemporary theorists to a hypothesis of purely or mainly nervous causation is warranted by the facts. The study of the disease from a clinical standpoint tends rather to prove the general truthfulness of the older conjectures about gout than to support more recent theories. For the moment, in any case, I would urge the practitioner to keep his old lamps and not to be in haste to barter them away for new ones.

In gout we have a malady which consists in the presence of a noxious material, and this has been demonstrated to accumulate chiefly in the liver. That it circulates abnormally in the blood we know; that it is an irritant we are sure; that it will readily set up

local inflammation, and necrose the tissues it permeates, is only too clear; and that the proper way to get rid of it is through the kidney excretion is beyond dispute. Upon these broad bases we may speculate as we please; and if we regard the many respectable but contradictory theories which prevail, and which are severally supported by facts and data that cannot be impugned, we must conclude that the facts and data in connection with gout are of a nature to render them available for the defence or demolition of almost any theory that can be broached. This is the truth; and, because it is so, I say again to the practitioner, whose first concern it is to cure, or relieve: Hold to the clinical study of the disease, and treat your patient on principles of common-sense, with the aid of what is certainly known, and with as little embarrassment from theories as the difficulties of the task and the multitude of counsellors may render possible. The aim of what I shall hereafter have to say on the subject will be to rescue the treatment of gout from theories as to its nature and causation, and to deal rather with the *patient* than with the *disease*.

CHAPTER II.

"THE GOUTY CONSTITUTION."

THOSE who desire that we should discard the term *constitution* ought, before we comply, to suggest a better one for use in its stead. By "the gouty constitution" we understand that type, habit, or character of the organism which either necessitates, or inclines to, the accumulation of uric acid and its compounds: and this necessity or inclination must, as we know, arise out of, and therefore depend upon, some peculiarity of structure.

If any part of the organism—whether it be stomach, or liver, or brain—act in a particular way as a matter of habit, that must be because, either in its coarse, or in its molecular, constitution, there is some physical peculiarity which prepares and disposes it so to act. The influence of surrounding circumstances and conditions of life may compel or incline an individual to behave in a particular way on a special occasion; but, by the law of development, an organized habit so impresses or conforms the living organism, and modifies its nature, that, if it reproduce its kind, the progeny will undoubtedly possess, and probably present, the same inclinations as the parent, because they will have been brought forth in structural "likeness" of their progenitor. This is how all habits,

whether of body or mind, are handed down from parent to offspring, and the habit of accumulating uric acid, whether by over-production or defect of destruction or re-absorption, in such a way as to produce "the gout," simply obeys a law to which there are no exceptions.

If in any case the structural disposition tend strongly to this fault, the gouty constitution will be clearly and typically developed. If the habit of the ancestral organism have been less definitively organized, the development of the gouty constitution will be less complete. Moreover, much will depend on the individuality of the particular person whose case we are studying. If there be great individuality, the inherited type may be merged, as it were, in the personal constitution, and the gouty tendency may be held in check; though the peculiarity of structure on which it depends is not modified, and a subsequent heir of the organic estate, with less force of individuality, may revive it, thus producing the phenomenon of atavism, or seeming inheritance from a grandfather. I say seeming, because the estate is of course continuously entailed, but, as it happens, some parties in the line of descent are so strongly individualized as to act independently of it. This emancipation from the tyranny of the direct inheritance may be achieved by the conditions of procreation, by the introduction of a discordant or interrupting "strain" from the family of the other parent, or, possibly, by the educational effect of modes of life, food, exercise, &c., by which the organism is conformed to the characters of its own environment, and thus escapes the influence of the inherited habit. The law of development is the key to the whole mystery

of inherited disease, whether of body or mind, and the effects and influences of this law are strikingly brought out in connection with the disease we are studying. It may take several generations to build up the estate of a gouty constitution, and to thoroughly entail it. Probably even a longer series of successions will be required to change the morbid type in a family so that the gout may be eradicated. On one fact we may confidently rely: the longer gout has been in a family the less likely is it that any individual member will escape, and the greater will be the need to recognize the gouty constitution as an underlying source of weakness or disorder in the treatment of every malady with which the inheritor of gout may be affected, whether he be himself gouty or apparently free from gout.

As regards the line of the entail of gout, I am inclined, by inferences from an extensive series of observations, to believe that there are certain notable peculiarities with which the practitioner may very profitably concern himself, and which will afford him no small help both in the diagnosis and in the treatment of diseases and disturbances of anomalous character occurring in the members of gouty families. I will try to state the conclusions at which I have arrived as concisely as possible.

1. In families decidedly gouty, and in which the male members have for several generations exhibited the characteristic phenomena of gout, the daughters of each generation will, as a rule, be either subject to gouty affections of the joints, particularly of the superior extremities, or neurotic.

2. The children of daughters of typically gouty

fathers will be gouty, but, while the males among them will probably develop gout after the fashion of their maternal grandfathers, the females may not themselves develop gout, but will transmit the gouty inheritance in such a way that *their* sons will be subjects of gouty neuroses.

3. Speaking broadly, the more commonly recognized forms of gout, particularly those which deform the extremities, descend in the direct line from father to son, the daughters of the family being affected in a secondary way, as just noticed; while the less characteristic forms, such as gouty affections of the nervous system, neuralgias, and the like—which may appear in any organ—more commonly pass by the oblique line of descent from father to daughter and from mother to son.

4. Gout in the oblique line is more likely to be suppressed—or undeveloped—in alternate generations (atavism) than gout in the direct line of inheritance.

5. Those members of decidedly gouty families who are not manifestly gouty commonly suffer from low type, and chronic inflammatory, affections of the mucous membranes, with discharges or catarrhs—*e.g.*, laryngeal and bronchial, pharyngeal, gastric or intestinal, biliary, vesical, urethral and vaginal, conjunctival, coryza, otorrhœa. These local maladies, which not unfrequently become exceedingly troublesome, may at any time take on a virulent form and resemble graver or even specific affections. For example, it every now and again happens that a urethral or vaginal discharge is mistaken for a gonorrhœa. Crystals of uric acid may, however, generally be detected in the mucus

poured out in such cases, and thus the diagnosis is controlled. Such irregular forms of gout are common among the children of daughters of gouty men, although those females may not be themselves gouty.

6. The children of gouty parents, if not themselves apparently gouty, are often the subjects of gravel, or stone, or "albuminuria," and occasionally granular casts are found in their urine with crystals of uric acid, without, however, other evidence of kidney disease. In such cases complete recovery so commonly happens that the prognosis of "albuminuria" occurring in a patient with the gouty constitution, when there is no collateral evidence of disease of the kidney, is generally favourable.

7. The female members of decidedly gouty families, when not themselves obviously gouty, are peculiarly prone to affections of an apparently *rheumatic* character, which do not, however, yield to the ordinary measures of treatment applicable to the rheumatic state, but give way readily before remedies for gout.

8. If children of gouty parents suffer from convulsive affections during teething, they are very likely to have epileptiform "attacks," at long intervals, later in life, and these require for their treatment, not the remedies commonly employed against epilepsy, but those appropriate for the relief of gout.

9. When an inheritor of the gouty constitution marries an inheritor of the strumous constitution or a person whose organism is tainted with syphilis, the children of such a union are likely to exhibit anomalous affections which, while presenting characteristics of the two diseases, do not precisely correspond with either; and

these diseases can seldom be successfully treated unless by measures applicable to gout.

10. The entailed estate of gout in the constitution makes itself felt in and through almost all the acute and chronic diseases from which a person so affected may suffer, lowering the tone of the system, and tending to make these maladies put on features and characteristics of depression; exaggerating and thickening exudations; rendering the healing of wounds difficult, suppuration especially likely to occur and extremely difficult to restrain; giving an almost tubercular character to lymph; and generally lengthening the processes by which health is regained.

Bearing these facts in mind, and remembering the probability of a gouty inheritance in cases where anomalies or embarrassments of the classes above mentioned are observed, it will often be possible to recognize the gouty constitution when and where its typical features and characteristics are not self-evident.

I do not think it is practicable to formulate the distinctive features of the gouty constitution in a clinical picture, so that the practitioner may carry it about in his memory, and employ it as a standard or test. There is no single characteristic of the so-called "type" which can be relied upon. It is true that a considerable class of persons with bloated features, heavy lips, thick skins, and pallid complexions, clumsily shaped and thick fingers with badly formed and broad nails, which show little of the "moon" at the base, prove to be gouty; but so do the florid, thin-skinned, and more delicately formed and lightly built men, with refined contours of face, thin lips, and

slender and well-developed fingers ; and, so far as I can see, in an equal proportion of instances. It does not appear that gout, which is really a disorder of function rather than a disease—although it unquestionably depends on an organic peculiarity—sensibly affects the physique unless, or until, changes begin to be wrought by the deposit of gouty material in the tissues. Nor is it possible to say truthfully that gout—properly so-called—does not attack the hard-working and hard-living classes as freely as the indolent and the opulent, or that there are two forms of gout—one which assails the rich, and the other the poor.

Deposits of gouty material are, indeed, especially common in the case of those who do not live lives of great muscular activity, although physically well fitted for such exercises ; but the deforming type of gout is not the most characteristic. I think, if this malady were studied more closely from the clinical standpoint than it has yet been studied, it would be found that the presence or absence of deposits and distinctive local disturbances are determined by the organic and functional conditions of the individual rather than by any speciality of development which can be recognized in the disease. Obviously, different types of organism are likely to be affected in different ways by the same disease ; and as family likeness consists in hereditary resemblances of structure, similar forms of disease are likely to be found in successive generations of the same family : and if of the same family, why not in the same class ? This is a very different thing from diverse forms of a malady affecting separate classes or orders of the people.

It is the fashion to say that gout is uncommon among hospital patients; but, if the suggestion I have ventured to throw out be well founded, it might be more accurate to say that the gouty constitution underlying, or the gouty element present in and modifying, the maladies of those who become hospital patients is not commonly recognized. I have a very strong persuasion, based on a search for gout among hospital patients years ago, that this is the truth: that the essential error or fault of "the gouty constitution" is greatly more prevalent than it is commonly supposed to be, and that in point of fact it lies at the root of the trouble in not a few of those very obscure and intractable cases which crowd the out-patient rooms, and help to fill both the medical and the surgical wards, of our general hospitals. The idea that children are not affected with gout is manifestly fallacious; and I cannot help thinking that the disorder is of quite as frequent occurrence among females as among males. Indeed, my own case-books show actually more instances of gouty deposit, particularly in the upper extremities, in cases of women than in those of men.

The relations of "the gouty constitution" to what is called the "uric acid diathesis" are not so well defined that we can found any hypothesis on the supposed substitution of the two, or the bearings which one may have on the other. Little is to be gained by speculating on the nature of diseases; and the great need of the moment in regard to "gout" is to bring the disease or disorder back to a simple clinical standpoint. Instead, therefore, of laying greater stress on the importance of

recognizing "the gouty constitution" than is implied by the observations already made, I would prefer to say : Whenever and wherever an anomalous type of disease, or an obscure or intractable affection, arrests attention by its symptoms, or baffles treatment, think of the possibility that there may be gout behind or beneath it ; and search for the evidences of an excess of uric acid in the fluids of the body, with perhaps extrusion of this irritating excrementitious substance, *goutte à goutte*. In a word, the observant clinician will infer "the gouty constitution" from the discovery of evidence of the gouty habit, rather than hypothecate the gout from a fancied recognition of the type of constitution or organic habit upon which it is supposed to depend.

CHAPTER III.

THE ATTACK OF GOUT.

IT has been alleged that when an attack of gout occurs in the case of a person who has not inherited the malady, that person is sure to have lived in luxury, indolence, or self-indulgence, particularly in what are denominated "the pleasures of the table;" and, conversely, that when an individual not thus indulgent to his appetites and neglectful of exercise has an attack of gout, he certainly inherits the disease. I have not found these propositions borne out by experience any more constantly than I have found that subjects of the attack are, as a rule, fat, have red faces and red noses, varicose veins and hæmorrhoids. These general statements are not *clinical*, and tend to mislead. It is practically impossible to recognize gout by the "appearance" of the person affected with it; it is equally impracticable to forecast the occurrence of a first attack by what are called "premonitory symptoms." No doubt most patients can recall sensations, and their friends may recollect observing indications of illness, before the attack, but such "sensations" and "indications" have probably been present a score of times before, and will be present again, without resulting in gout. The subjective symptoms, if there be any, preceding a first attack of this malady may be

characterized as those of dyspepsia, that is, difficult or disturbed digestion; with one or two exceptions, which do not, as a rule, attract general attention. They are these: mental depression, more or less marked, or of longer or shorter duration, according to the temperament of the individual, ranging from anxiety to moodiness; a peculiar feeling of fatigue within circumscribed areas, of weight or numbness, or "pins and needles," in the limbs; localized perspirations, which are apt to be profuse; and sometimes, during the few days immediately previous to an attack, considerable variations in the quantity, density, and colour of the urine. On the whole, probably, there will be a diminution in the quantity of urates voided, but not unfrequently the reverse is the case; and it is actually *after* the kidney has established an exceptionally large discharge of the irritant material the attack occurs. Looking back on a case, it is not difficult to discover adumbrations of the impending illness, but, looking forward, it is impossible to say with any certainty that, because certain symptoms are present, gout will ensue. The attack generally comes on in the night, and it is easy to see why this should be. The circulation is slower, and the formation or deposit of crystals of uric acid or urate of sodium is thus and then peculiarly likely to occur.

The patient has generally been asleep for some little time, when he is awakened by pain; or wakes to find that one foot or leg is heavy, stiff, tense, and, either before or when he tries to move it, that it is extremely painful. The pathological cause of the attack is the deposit, and the general symptoms which com-

pose it are the effects of that deposit, so that they will be more or less severe as the quantity of the deposit is great or small. Although gout, as a whole, is a general disorder, the attack is a local or localized malady—that is to say, dependent on a local cause. Cases will therefore differ, in regard to the details of their phenomenal development, as the deposits on which they depend differ in their nature, place, and dimensions.

It is a serious obstacle to the study of gout in its clinical aspects that it should be regarded as a particularly well formulated disease. The diagnosis of gout, at least in its acute form, is generally the work of an instant, and, straightway, one of the received methods of treatment is put in force without reference to the individuality of the case or the special features of the attack; whereas I believe everything depends on the way in which the paroxysm begins, and if this be not very closely investigated, and the treatment specially directed to fulfil the precise indications of the mode of a first attack, important suggestions for the future management of the case, and significant grounds for the formation of a prognosis, are lost. Without in the least pretending to give an exhaustive classification of the modes of attack in gout, let me try to illustrate the importance of very great attention to this phase of the subject by two or three general observations.

1. If the blood become, at any time, charged with gouty material, the presence of this irritant—whether the fact that it irritates be due to its nature or to its quantity—may give rise to a brief paroxysm of fever, resembling the febrile state so commonly attendant on

surgical and medical maladies, in no way specific in its character, and not followed by any local affection to give it a name. There will sometimes be a "horror" or slight rigor, a stage of high temperature, a more or less profuse perspiration, and a subsidence with or without prostration. It seldom happens that, beyond some malaise and perhaps a little general stiffness, with, in rare cases, some flying pains in the extremities, there are any symptoms of illness during the following day, and the instances in which there is a repetition of the paroxysm the ensuing night are proportionally few. Nearly always these attacks end within twenty-four hours with a copious discharge of urates in the urine, and are not recognized as gout at all. If a medical man should chance to see the patient at the time, gout may cross his mind, but when he finds the unformulated attack end thus rapidly, he will dismiss the idea, and account for the disturbance by attributing it to some indiscretion in food or drink, which may or may not actually have occurred. I believe such attacks as these are really the *first* manifestations of gout, and that if only their true nature were perceived, and suitable treatment at once adopted, more characteristic paroxysms and a fuller development of the disease might often be avoided—albeit, as the inheritance proves, the underlying disposition to error of function in regard to uric acid is undoubtedly *organic*. It by no means follows that, because there may be some structural peculiarity in a particular organ rendering it likely to act in a bad way, the evil tendency cannot be controlled.

2. If there be any considerable accumulation of the

gouty material, sodium urate, in the blood, it may be determined in the night—when, as we know, the circulation is slow, the quantity of oxygen consumed small, and the conditions are favourable to the formation of deposits or to the transudation of fluids generally into the interstices of the tissues, and when all the organs are performing their functions with a minimum of energy—to any special locality. If there be one point which is, either by exceptional conditions at the moment, or structurally, or by habit, particularly likely to become congested, accumulation or exudation of the gouty material may take place at that point, and the attack which occurs will be formulated and characterized by the nature and function of the part principally affected. Thus, if there should be a sudden blocking of the renal tubes, there may be the symptoms of an acute attack of nephritis, and except that it occurs in the night, and ends with a discharge of urates, there will be nothing to show that it is gout. Or the liver may be congested, and, being laden with uric acid, there may be the symptoms of hepatitis or biliary calculus. If there should chance to be any cerebral disturbance, such as may be caused by over-work, or special excitement or worry, at the time, the attack may take the form of a “fit,” with even partial paralysis; or a paroxysm of delirium, resembling delirium tremens and perhaps diagnosed as such, may occur. If there be undigested food unduly detained in the stomach, the attack may resemble acute gastritis, and is not unlikely to be followed by a prolonged gastric catarrh; or, if there be a local irritant in the intestines, symptoms of enteritis, approximating the effects of an irritant poison, may be occasioned. In

women there may be acute inflammation of the ovaries, while men may have orchitis, the organic irritation in either case being perhaps followed by a urethral discharge resembling gonorrhœa. In short, there is no end to the variations which may occur in a first attack of gout; and I believe it is because we do not suspect the real nature of many of the anomalous and apparently causeless and inexplicable illnesses to which the members of gouty families, and others, are subject, the impression prevails that gout is a comparatively rare disease, except among special classes, whereas it is one of the commonest of common diseases, and the underlying cause of no inconsiderable proportion of the intractable maladies which it sorely taxes the ingenuity of scientists to explain and practitioners to treat.

It is easy to see that, if the first manifestations of gout are really as diverse as I have contended, it must be of the highest moment to bear this fact in mind, because the part or organ first affected will generally require to be afterwards recognized as a weak point in the particular organism; and the treatment of the special illness which occurs ought to be actually a treatment for gout.

The leading characteristics of an attack of gout, whatever form it may take, are probably to be found in the time of its occurrence, and the fact that it subsides with a discharge of urates more or less profuse. In all cases in which illnesses, commencing suddenly, end in discharges which appear to be—as the old-fashioned term went—“critical,” an examination ought to be made with a view to the detection of uric acid crystals, or one of the familiar compounds of that acid with a base, either in the urine or some other discharge.

The typical attack of gout universally acknowledged as such occurs, as I have said, at night, usually a little after midnight, and, when the sufferer wakes to find himself in pain, it generally proves that the metatarso-phalangeal joint of the great toe is acutely inflamed, so that it cannot be disturbed by the least movement without great agony. The surrounding tissues of the articulation will be the seat of an acute effusion; the vessels of the part will be distended with blood; the block occurring first on the venous side, owing to the mechanical obstacle offered to the return of the blood by the inter-connection of the veins, and the hyperæmia being secondary and the result of the irritation set up by the outpouring of gouty material. Towards morning there will be a diminution of the excitement, and probably a more or less copious discharge of urates in the urine; but the local deposit will have occasioned an irritative fever, which, like all pyrexiaë of its class— hectic being the type—will return, after a remission, on the afternoon of the following day, and continue to recur daily, until either the blood is relieved of its gouty material and the local deposit is taken up and removed by the lymphatics in the usual way, or the tissues invaded have begun to accommodate themselves to the presence of the foreign substance in their interstices. In an early attack of the malady it commonly happens that relief is speedily obtained by the voidance of a considerable quantity of urates in the urine, so that the irritative fever may subside in a few days, or at most a week; but the length of the attack will be entirely dependent on the accumulation of uric acid in the organism and the extent of the local dis-

turbance, which directly depends on the amount and the precise position of the deposit; being, of course, more severe when thrown out within a joint than around it, or in the interstices of an unyielding tissue than in that of one that will readily give place; the accident of pain being dependent on the compression, stretching, or mechanical irritation of the nerves distributed to or passing through the part affected. If local branches only be affected, the pain will be limited to the area of the tension, whereas if the trunks of passing nerves are compressed or irritated there may be neuralgic pains along their course or at the points of their distribution.

There is no radical difference between an early and a later attack of gout. The nature and intensity of the symptoms depend, first, on the general disturbance, and, secondly, on the local disease. Podagra, chiragra, gonagra, and omagra occur in frequency in the order in which I have placed them. Gout generally attacks the smaller joints first, though it may in severe cases afterwards attack the larger. Rheumatism, on the other hand, as we know, generally in the first instance attacks the larger joints in preference to the smaller. The difference of the habits of the two affections is not, however, so strongly marked as the text-books represent; and the inter-relations of "gout" and "rheumatism" are much closer than many authorities would lead us to suppose. What further it may be needful to say about the general features of an attack of gout may be now conveniently said in connection with the subject of *principles* of treatment. We will deal with the details of management, and give formulæ, in Part II.

Let us suppose the practitioner to be summoned to the bedside of a patient suffering with an ordinary attack of gout. He will probably find a man between thirty-five and fifty years of age, in good condition, with a well-developed muscular system, a full chest, and the general appearance of having been suddenly attacked with an acute illness while in robust health. If the attack be an early one, and the patient be seen promptly after the first accession of pain, the face may be flushed and animated, the eyes bright, the pupils small, the conjunctivæ injected, the skin wet with hot perspiration, the pulse bounding, and the general condition that of a person in the early stage of an erysipelatous inflammation. Indeed, there are many points of resemblance to the general characteristics of erysipelas, as regards the rise and progress of that disease, which ought to be borne in mind throughout the study and treatment of gout. If, however, the first visit be not paid until some hours have elapsed after the commencement of the attack—for example, towards noon of the following day—the general state will be less sthenic: the face may be pallid, the expression one of exhaustion or weariness from pain and rapid loss of nerve-force: the pulse will be still bounding but compressible, the temperature high under the tongue and in the axillæ, but not over the general surface, except at the points of local inflammation. The skin will be bedewed with cool sweat, and the first thought of the cautious practitioner will be of a sustaining or stimulating rather than a lowering diet. The condition of the tongue varies considerably in gout from hour to hour, and, for the first two or three days at least, not very much is to be learned from it, even as regards the need of

aperients for the relief of the bowels, which, although commonly inactive, are occasionally in a state of irritation, with loose though small stools. Such are the broad features of the case as they first strike the practitioner, and before he directs his attention to the local malady. It is always well to note these "first impression" carefully, and to give full weight to the indications they afford, for the true treatment to be adopted must be based chiefly on the general state. The local features of the attack are more apt to be misleading. The affected foot will be found swollen, and hot out of all proportion to the state of the body generally, so that if the practitioner shaped his measures to the local malady they would be too strong for the organism as a whole. This is, in truth, a mistake not seldom made, and thus the régime adopted is apt to be excessively severe, to the detriment of the sufferer and the lengthening of his illness.

Until comparatively recent times it had been the practice to lay great stress on the local measures to be employed. Hot or cold affusions or compresses, anodyne fomentations, and a host of applications were made to the part with various intentions, upon the assumption that even though the main attack must be made on the system as a whole, much might be accomplished by measures directed to the reduction of local temperature and the relief of tension in the parts affected. If, however, we only remember the rapidity with which the local symptoms arise in an early attack of gout, and how quickly they disappear as soon as the paroxysm is over, we shall not fail to perceive that it is to the general state attention should be primarily directed, and

that, as experience abundantly proves, the less we do locally the greater will be the prospect of a prompt and complete recovery.

The worst cases I have seen have been those which have been treated with energetic measures locally. Notwithstanding the extent to which it is employed, and the very high authority for its use, I am inclined to think that the most mischievous treatment is that which consists in painting the surface with tincture or pigment of iodine. The skin covering the swollen joint is in a state of tension and in a sensitive condition, with a very high temperature, as shown by the surface thermometer. This is not a state in which local applications even of the most soothing description are advantageous. The cutaneous nerves are super-excitable, and almost every application which can be devised aggravates the local disturbance by reflex-irritation. If it were possible to protect the surface from currents of air without the contact of any substance, solid or fluid, it would be better to do positively nothing. As it is, there is no better policy than to cover the part, as lightly and tenderly as may be, with a moderately thick layer of the finest cotton-wool, which has not been compressed, and to encircle it with a strip of dry flannel. Waterproof coverings are bad, because they confine and condense the vapour given off from the skin, and throw it back in the form of moisture. The wool, if it lie loosely around or over the joint, and be simply kept in its place by a strip of flannel, will absorb the vapour as it is given off, and allows it to evaporate. A cradle of cane or wicker-work, which may be readily made from an old basket,

will take the weight of the clothes off the limb, and with this simple treatment the local trouble had better be left while the practitioner addresses his active measures of relief to the principal seat of the disorder—namely, the blood.

The older physicians were wont to debate whether it were well to evacuate and refrigerate, or if they ought to stand by, “committing the person to patience and flannel alone” (Cullen). Later on, colchicum came to be regarded as almost a specific for gout. Time and experience have greatly shaken the faith of the profession in this remedy, and practitioners have for some years past been gradually falling back on alkalis to neutralize the acid and opium to relieve pain. There is seldom much time to deliberate as to a choice of measures, and those who are suddenly called to a case of this class are apt to treat it by rule of thumb, as they have seen it treated at the hospitals or by practitioners with whom they happen to have been brought in contact. The fact that, at least until the later stages of this life-long disease have been reached, recovery is generally counted upon, and peril to life scarcely anticipated, has an unfavourable influence on the treatment of the malady, and makes us too ready to rest satisfied with the methods in vogue without any great effort for their improvement. I will not now dwell on the plans of treatment commonly adopted, but proceed to lay down as concisely as possible the *principles* of the method which I have been led to pursue, and which I find on the whole, and in the majority of instances, satisfactory and successful.

If the bowels have been opened sufficiently within a

few hours of the attack and regularly on the preceding days, and there is no reason to suppose that either stomach or intestines contain any specially irritating matter, it is better to leave them alone than to risk the production of liquid stools and the determination of fluid to the alimentary canal which ought to be directed to the kidneys. The irritant—if not the morbid—material in gout is, as we know, peculiarly insoluble, and the larger the amount of fluid available for its solution the less likely is it to be deposited or to crystallize. If the bowels have not been moved, it is well to give an aperient; but it should be one which will act with extreme gentleness, and simply remove the contents of the intestines without exciting the glands to increased secretion or the muscular coat of the alimentary canal itself to needless activity. If it were possible to see a patient before his attack occurred, it might be worth while to stimulate the mouth of the common duct so that the gall-bladder and the liver might be unloaded; but when once the attack has commenced, it is too late to think of this, and, for the physical reason above mentioned, it is mischievous to attempt it. There is nothing better to give, with a view of emptying the bowels without disturbing them, than a moderate dose—say, two, three, or, in the case of large-framed and full-blooded men, four drachms—of phosphate of soda, the old-fashioned “tasteless salts,” dissolved in a cup of mutton-broth. This will generally produce one motion, or at most two actions, of the bowels, without exciting any subsequent irritability. Following the indication to preserve the fluidity of the blood and to keep the organism generally well supplied with liquid,

it should be an essential part of the treatment to encourage the patient to drink freely and frequently of some beverage of light density. Looking to the fact that during the attack, and often for some days before its occurrence, there is apt to be a considerable drain of fluid by perspiration, it is the more necessary that comparatively large quantities of liquid should be taken to compensate this loss. Moreover, there is nearly always some block of the renal tubes by crystals of uric acid, and that the kidneys should be flushed is one of the most obvious indications. The discharge by the skin is to be discouraged, the discharge by the kidneys encouraged; therefore, the room in which the patient lies should not be much over 60° Fah., and the clothes covering his bed must not be thick or heavy, while, of course, care is taken to avoid draughts of cold air, and no portion of the surface is needlessly exposed to the peril of losing organic heat rapidly. Although the temperature of the body in gout as shown by the clinical thermometer may be high, rising to $102-3^{\circ}$ in the afternoon, it is likely to fall rapidly, and the pulse, though strong, may readily become compressible. It is accordingly necessary to supply a nutritious diet, and I am persuaded that there is in this malady throughout, with the rarest exceptions, a continuous need of stimulants. Give, therefore, a liberal supply of strong beef-tea, well-made mutton-broth, or good meat-soup from the outset, and let the patient be supplied with a light wine, such as sound hock, or, if he much prefer it, a thin claret, at short intervals. The precise quantity of stimulant which it is desirable

to give in these cases not only differs so much with the individual, but varies so greatly in the same case from day to day, that it is impossible to lay down any precise rule. The practitioner must base his directions for the periods between his visits on the state of the pulse, the condition of the tongue and skin, and on general principles ; but I have learnt by experience that it is safer practice to give somewhat too much than too little stimulant, and that the instincts and feelings of the patient may be trusted to a greater extent in gout than in almost any other illness of like severity. If the surface at any time become cold, or the temperature begin to fall rapidly, it is well to give a glass of dry champagne, and to watch the effects of this restorative with a view to its repetition when necessary. In every case a careful note should always be kept by the nurse in attendance of the nature and quantities of the nourishment and stimulants administered, so that the practitioner may be in full control of this branch of treatment—for such it is—throughout the paroxysm.

It should be needless to say that immediately on our taking medical charge of a case of gout the condition of each organ of the body ought to be investigated, and that no pains must be spared to keep the judgment informed as to the state of the organism while it is passing through the disease. The heart and lungs ought to be explored with the stethoscope at least daily ; the boundaries of the liver and the spleen—in both of which uric acid is sure to be present in abundance—should be at least approximately noted ; the stomach will need to be watched for that atonic dilatation which so often precedes a metastasis in severe

cases; the region of the bladder must be explored frequently lest there should be retention of urine from atony; and, above all, the urine should be examined for albumen and crystals and casts, and the proportional quantity of urea estimated, daily. There is really no difficulty in thus closely watching a case, if the practitioner will make it part of his routine duty to apply the necessary tests. The whole series of percussions and palpations requisite can be performed, in a few minutes, without causing the patient the smallest pain or annoyance, and the urine may be collected and saved by the nurse to be sent to the practitioner's house for an examination, which, inclusive of the estimation of the urea by the hypobromite test with either of the well-known apparatus, will not occupy more than five minutes. It is impossible to insist too strongly on the need of these very ordinary and thoroughly practicable precautions, in default of which complications, that may at any moment arise in a case of gout, are likely to be undetected. This will suffice for the general outline of management, and we may now pass to the subject of drugs or directly remedial treatment.

I am unable to accept the doctrine that there is nothing to be done in the way of treatment by drugs in gout and rheumatism. No one who has seen much of these maladies can regard them as affections so formulated that they must necessarily run a particular course. The "fever" which accompanies gout is evidently irritative, and while it behaves as fevers of this class always behave in respect to the rhythmical rise and fall of temperature every twenty-four or thirty-six hours, it is entirely dependent for its duration on the

quantity of the gouty material which has accumulated and the readiness and completeness with which this can be evacuated. Measures, therefore, may, and I think ought to be in all cases, taken to promote the discharge of the uric acid, and this must be accomplished by and through the kidney excretion. It is impossible to get rid of the uric acid in acute gout through the skin, although doubtless, when the system is surcharged with it, a certain proportion does escape through that avenue. Cases are on record in which the skin has been covered every morning with what is popularly called "chalk," giving the patient the appearance of having been dusted with white powder. The deposits which are so commonly found immediately under the cuticle covering the cartilage of the external ear and between the layers of the membrana tympani—a common cause of deafness—in cases of hereditary gout, show how the excretory substance may be, and often is, determined to the surface. Nevertheless, it is hopeless, and would be dangerous, to try to relieve a patient by sudorifics; nor will drastic purgation answer the purpose. There is, I think, little or no reason to suppose that uric acid can be excreted plentifully by the glands of the intestines, or that it will be voided with the bile, although some authorities believe it may, and rely very much on that method of evacuation. Beyond question the proper way of exit for uric acid and the urates is the kidney, and it is to the kidney-function, chiefly, the attention of the practitioner should be directed; the perspiration in gout being regarded as an obstacle rather than an aid to cure, inasmuch as it certainly reduces the flow of fluid through the kidney.

As I have already pointed out, the skin must therefore be kept only moderately warm—just warm enough to prevent a chill—in order that to the renal exit the large quantity of liquid it is expedient to give may be directly determined.

Diuretics—conventionally so-called—do not avail in gout, because they nearly all act by stimulating, that is, irritating, the kidney. In gout the kidneys are already irritable, and it is partly because they are blocked by urates they cannot work freely. Anything that would increase the local irritation must therefore be avoided. Everything taken should be much diluted, and all that can be given warm should be so. It is rather to the mechanical process of “flushing” the kidney than to special stimulation of its excretory function we must trust for the clearing out of the urates in gout. Meanwhile, there is an old-world remedy with which we are all perfectly well acquainted that has not, until recently, so far as I am aware, been extensively employed in a work for which it is admirably adapted. I allude to the chloride of ammonium or sal ammoniac. Largely diluted, this salt acts continuously, and at the same time gently, on the kidney, promoting the passage of urates through that organ, and its action is greatly increased if it be combined with chlorate of potass. A dilute solution of these two salts will almost invariably procure a diuresis without increasing, but, on the contrary, relieving, the irritation and congestion of the kidney. I do not forget the importance of endeavouring to supply soluble bases for the uric acid, and ammonium is not theoretically a good one, but in practice it answers well.

With the increased activity of the kidneys which the use of the above-mentioned salts secures, we may resort to direct measures for the decomposition of the sodium urate in the blood; and for that purpose, I believe, the most potent and suitable drug is *iodine*. The effect of this remedy administered internally in gout is as beneficial as its external use is—in my experience, at least—valueless, or even harmful. The best mode of administration is in the form of tincture. I employ a formula, which will be found in Part II., combining the above-mentioned salts with the iodine in the presence of glycerine. The mixture should be given in as much water as the patient can be induced to take with it. There is seldom any difficulty in securing its dilution to the extent of nearly half a tumblerful; and, although the taste is disagreeable, so sensible is the sufferer of relief from his pain after each dose that he will be anxious to repeat it. Since I have used this mixture in acute gout I have not had need to employ opium or any other drug as an anodyne or soporific. Natural sleep has occurred, and the treatment of the malady I have found to be greatly simplified. The attack is considerably shortened under its use, the pain and tension of the part or parts affected rapidly abate, the temperature, generally, is reduced, and, which is critically important in the conduct of an attack of gout to a successful issue, the quantity of the urine passed is augmented, and the urates are voided, while the proportional amount of urea usually rises progressively. It often happens that from only four or five grains per ounce, of the urine passed in one period of twenty-

four hours, the urea will reach ten or twelve grs. in the next period. It is of course always necessary to measure the total quantity of urine passed, and to note the specific gravity at each examination, which, as I have urged, should be made daily and as nearly as possible at the same hour. It is convenient to have a specimen sent for examination each morning before the visit, that the chemical data may be available for the guidance of the practitioner in the formation of a judgment as to the renal state of his patient in view of the general clinical results.

If any one should ask whether all this trouble in the management of an acute attack of gout is absolutely necessary, I can only reply that it is so if we are to do the very utmost in our power for the speedy and complete recovery of our patient. It is seldom necessary to change the medicine during the attack. When the more urgent symptoms begin to subside, the dose may be reduced, or—which is better—the mixture may be given less frequently; but it is important to maintain the action of the iodine until the attack is passed and health is regained. After a few days a grain of quinine may be added to each dose of the mixture, which will then probably be serviceable if given only thrice daily; but if there should be the slightest diminution in the total quantity of urine voided in any twenty-four hours, or the proportion of urea discharged is diminished, the quinine should be omitted, and the mixture be again administered in its original form every fourth hour until the improvement is re-established. In cases of extreme severity a dose

may be given every third, or even every second, hour, but this is rarely necessary; and it is desirable to attain one's object with as little medication as will suffice for the purpose.

If from any cause this treatment should fail, or it be not desired, there is always the *colchicum* treatment to fall back upon. The best plan is to give the wine, which is made from the corm, in doses of twenty minims, or half a drachm, with a saline or alkaline carbonate, or in Kronenquelle or one of the Vichy waters; that of the Célestin spring is perhaps the most suitable. Bicarbonate of potass may be combined with the colchicum. Some practitioners prefer to give magnesia instead of potass. It is considered desirable not to give more than some two drachms in all of the colchicum wine in the course of the twenty-four hours. There is another way of giving colchicum, the wine being administered in large doses, so that the bowels are irritated and purged—I suppose on the principle of “counter-irritation” and “revulsion;” but this method is not one which will commend itself to the careful practitioner. The disadvantages of colchicum are (1) that it often depresses the heart's action, sometimes so greatly that intermissions are produced; and (2) that it is frequently irritating to the intestinal mucous membrane. It is also doubtful whether the discharge of uric acid or the urates is really increased under its influence, although the kidneys act more violently. These organs are also, in my experience at least, readily congested by the colchicum. Its action is that of an anti-pyretic, and it relieves pain, but the good effects of the drug

are quickly lost, and it cannot afterwards be safely pushed far enough to recover its influence.

Better than the colchicum treatment, though not as good as the treatment by iodine, is one which I have found useful in cases of mild character or of subacute type, in which the pain is not particularly severe except on movement of the part affected, and in which the symptoms do not so directly point to a general systemic as to a local cause of the pyrexia—that is, the deposit of gouty material on the part affected. The remedy in such a case, and it will sometimes suffice in those of more acute type, is *phosphate of ammonia*, which, when in solution, has a recognized power of dissolving urate of sodium. I have conjectured—though it is as yet no more than a conjecture—that in the most acute forms of gout we have to deal with uric acid in the blood, although in the less acute urate of sodium is the irritant. I have certainly found well-formed crystals of uric acid in the blood in the vessels of the brain after death in cases of gouty inflammation of that organ, or, more accurately speaking, cerebral meningitis, occurring in irregular gout, of which more presently. If the pain be very severe, before having recourse to opium, it is well to try *succus conii*, in order to avoid the constipating effect of the opium. If the bowels do not act once daily, *phosphate of soda* may be employed as an aperient.

There is a class of cases in which it is, from the first, necessary to adopt a more stimulating plan of treatment. This may be seen at a glance by the pallor, or the rapid changes of colour, in the face, which attract attention when one first sees the patient.

The pulse is small in volume, or easily compressible, and the sphygmograph shows a tracing in which the arterial wave is but slightly indicated. In such cases there is either the effect of "shock" superadded to the irritation set up by the presence of the uric acid in the blood, or the average tone of the organism is low, irrespective of the gout. In the treatment of patients thus weak or depressed, the iodine method is most appropriate, and the necessary diffusible stimulant may be administered in the shape of fifteen-minim doses of tincture of *sumbul*. If, however, this line of treatment be not approved, the greatest benefit is often gained by the use of the *valerianates* of *soda* and *ammonia* with infusion of *serpentary*. The *serpentary* has, beyond question, a most markedly beneficial effect on the circulation, giving tone to the vessels. Under its influence the arterial wave rises, as shown by the pulse-tracing, and local deposits of the urates diminish rapidly. It probably stimulates the absorbents. It also increases the quantity of the urine, and generally raises the proportion of the urea. The plan of treatment to which I am now alluding, though inferior to the iodine method in acute gout, is of great value in many cases where there is much depression, sometimes "hysterical," and proves singularly successful in a large proportion of instances where the acute attacks are intercurrent in undeveloped gout of a low type, with small scattered deposits at the surface, as on the fingers; and anomalous symptoms which, without being strongly marked, seem to point to atonic congestion of the viscera. If it be true that *serpentary* acts like *guaiacum* on the capillary circulation as a stimulant, it

is not difficult to understand how the beneficial results to which I have adverted are attained. It is scarcely ever necessary to employ anodynes in cases of this milder and lower type, the valerianates with the serpentary so quickly relieve the tension—which causes the pain.

The prominent indication in gout is to re-establish a free discharge of uric acid or the urates and a full elimination of urea by the kidneys. The average amount of these substances given off in health is generally stated as follows:—Uric acid, from 6 to 9 grs. daily; urea, 450 to 500 grs. daily; or, more precisely, $3\frac{1}{3}$ grs. of urea for each lb. of the total weight of the body (Parkes)—that is, about 8 grs. per oz. of the urine passed. I do not think the standard thus set up for urea is sufficiently high. In practice I find that patients with a gouty tendency are not safe unless they eliminate 10 or 12 grs. per oz. of urine, the fluid excreted being about 1020 specific gravity. Eight grs. per oz. is doubtless ample in the case of men who are not over-fed and who lead active lives, but for the majority of gouty patients the proportional quantity of urea in the urine must be higher if they are to enjoy immunity from attacks of the malady. When, and only when, uric acid and the urates and urea begin to pass freely in a case of acute gout may we consider that the attack is in a condition to be cut short or to end. With the iodine treatment in most cases, and when the paroxysm is not very severe, with almost any treatment or none at all, elimination is found to commence on the third or fourth day. In very mild cases it may be discoverable on the

second day. Sometimes a considerable deposit of red or pink sediment occurs on one occasion only in each period of twenty-four hours. *All* the urine passed in this period should be saved during an attack of gout, and, as a rule, mixed and measured, a specimen being, as I have suggested, sent to the practitioner each morning for examination before his visit; but the nurse should be instructed to preserve separately any specimen which may contain a red or pink deposit.

Whatever may be the relation between gout and the uric acid diathesis, it often happens that patients with a gouty tendency pass gravel, and even small granules which are in fact uric acid calculi. This not uncommonly occurs when there is a strong inheritance of gout, and it is, in such cases, very important to inquire whether there have ever been evidences of kidney disease, such as albumen in the urine, and perhaps severe pain, with or without tenderness on pressure over the region of one kidney—generally the *right*. If this be so, there have probably been concretions of uric acid crystals in the renal tubes, and some small damage may have been done to the organ mechanically, before the minute particles escaped into the pelvis of the kidney. During or after this passage of crystals there may have been irritation and pain, and in some cases the pain may have continued in neuralgic form (nephralgia) by mere nerve-habit—a most important factor in morbid states generally and too often overlooked—for a lengthened period, perhaps even years. Or after their escape from the tubes into the pelvis of the kidney the little masses of crystals may have formed the nuclei of small renal calculi, the

persistent symptoms being those of stone, &c., in the kidney, the albuminuria which was really accidental and traumatic having ceased and been forgotten. Such small calculi or minute agglomerations of crystals are often passed during an attack of gout, and probably, in some instances, they are the exciting cause of the paroxysm. The practitioner should be on the watch for them. Their appearance may remove anxiety arising from alleged previous attacks of "kidney disease," and should, at the same time, put the practitioner on the alert for stone either in the kidney or in the bladder. It would seem probable that a certain proportion of patients with the uric acid diathesis, who would otherwise be distinctly "gouty," develop stone instead of gout, and the reverse is true. There is in most cases of gout a history of brief attacks of albuminuria and of gravel, and kidney disease is generally spoken of; but, in the majority of instances, whatever has occurred has been the effect of mechanical irritation of the kidney by gravel. Another point to be noted in connection with this voiding of gravel or pink sediment is the fact that while a reduction in the intensity of the symptoms and an improvement in the general state may be expected soon after it occurs (unless there be a recrudescence of the paroxysm), the change for the better is not usually immediate. The truth is, the discharge of uric acid and urates generally signalizes the clearing of the tubes of the kidney, but removal of the mechanical obstruction to normal kidney function does not necessarily mean instant elimination of uric acid from the blood. In some cases there may be a fresh blocking of the tubes, but this, in my experience,

rarely happens if the patient has been freely supplied with as much liquid as he can take in the earlier stage of the attack.

There is yet another plan of treatment suitable in some cases to which I wish to direct attention. It may be tried at once in subacute attacks occurring in patients with a decidedly gouty constitution, and particularly if there are deposits of the urates at the surface of the body immediately beneath the skin in small detached grains, or if either eczema or psoriasis has preceded the attack. In such cases we have to deal with a strong tendency to the formation of uric acid in excess; and it is desirable to meet this, as it were, half way, by encouraging the formation of hippuric acid instead of uric. This acid with its compounds is, as we know, abundant in the herbivora, and it is found normally in human urine, especially that of children. Indeed, the daily excretion of hippuric acid is nearly as large as that of uric acid. Seven and a half grains may be taken as the amount of the hippuric acid per diem, while that of the uric ranges from six to nine grs. The excretion of hippuric acid is largest after consumption of vegetable food, but it is also produced by meat-eating. This acid is readily soluble in water. Now, benzoic acid, which acts as a diuretic and appears in the urine as hippuric acid, has the effect of increasing the discharge of uric acid collaterally. It also operates beneficially by checking an excessive formation of phosphates. I therefore not unfrequently give benzoic acid, or benzoate of sodium, which acts like the benzoic acid, and is preferable as being more soluble.

Of all the plans of treatment named, I find that first discussed—the administration of iodine with ammon. chlor. and potass. chlor.—by far the most successful; and in an attack of acute gout I believe there is nothing to compare with it for rapid and safe action. The principle of all treatment must be to promote the discharge of uric acid and the urates by the kidney function, and to the condition of the urine attention should be primarily and continuously directed. It is well to diminish the frequency of the administration of medicine as soon as the desired effect is produced, rather than to reduce the dose. It is of the highest importance to get a patient suffering from gout well, and back to his ordinary mode of life, as quickly as possible. Nothing is gained, but, on the contrary, harm is done, by a long convalescence. The diet should never be so low as to be depressing during the attack, and the sooner the patient can resume his place at the dinner-table the better. I believe that great and lasting mischief is wrought by “starving” gouty patients and depriving them of alcoholic stimulants. This, however, is a matter which may be more conveniently discussed in Part II., where the treatment will be detailed more precisely. I am now only speaking of treatment in relation to *general principles*.

Let me conclude these brief remarks on the attack of gout thus:—

Give bland fluids abundantly to dissolve the uric acid. Direct the outflow towards the kidneys, and flush them to clear away any block in their tubes. Keep up the strength. Treat the fever as “irritative” and the depression as “shock.” Watch closely for complications,

such as congestion, or irritation, or inflammation of the several organs ; never leave one organ unexplored for many hours consecutively. If complications should arise, employ simple and direct measures for their remedy on ordinary principles, without suspending the main treatment for the gout. Give as much good sustaining food as your patient can take *throughout* the attack, and let him return to his ordinary diet at the earliest practicable moment. Fish and meat are to be regarded as necessities, and taken as freely as the state of the stomach, as indicated by the "appetite," will allow. Stimulants are almost invariably necessary, and should not be withheld. Hock is to be preferred as the staple beverage, and may be given freely. Spirits are bad as a rule *during an attack*. Aërated waters simply load the stomach and cause flatulence. There is no more refreshing ordinary drink than tea flavoured with lemon juice. Glycerine may be used instead of sugar, if it be thought desirable ; a teaspoonful of pure glycerine in a cup or tumbler of fluid frequently. Let the medicine be taken "less frequently" as soon as possible, and leave it off altogether as soon as the urea reappears in the urine in the proportion of 10 or 12 grs. to the oz., the specific gravity being not higher than 1020. The valerianate of soda mixture with the infusion of serpentary may be taken twice or thrice a day for two or three weeks after the attack. This matter of treatment, which I mention here simply to illustrate the need of method in fulfilling indications, will be discussed at greater length in Part II. ; where formulæ will be submitted, not to hamper the judgment of the practitioner as to the individual needs of his patient, but by way of suggestion.

CHAPTER IV.

THE INTERVAL.

THE inheritor of a gouty constitution is *always* gouty, and the intervals between "attacks," so-called, of the malady are the opportunities for absolutely remedial treatment. Unfortunately, this is not the popular notion of the matter; nor is it the prevalent view among practitioners. Even those who hold that gout is dependent upon an error of function causing excess in the formation or deficiency in the destruction of uric acid, are content with advising their patients to limit the amount of nitrogenous food they consume, and to avoid stimulants, trusting to "starvation" or low living to prevent a recurrence of the attack. What is this but trying to find a *modus vivendi* with the disease instead of curing it? I question not only the policy, but the manner in which it is attempted to carry it out. By lessening the quantity of the food consumed, and by reducing its nutritive value, we impair the power of the organism to assimilate nutriment, and the disassimilation grows progressively more defective as the policy of submission to, and retreat before, the enemy is pushed to its extreme possible limits. Was there ever a case of acid dyspepsia cured by dieting? Was there ever a case of gout or of gouty albuminuria benefited by the "starving" system? If we are to do anything with a

disease which is manifestly on the increase, and from which some of the most formidable affections that medical men are called to treat unquestionably arise, we must not rest satisfied with a method which is merely one of concession to the morbid demands of the malady we have to treat, and only "prophylactic" so far as the overt manifestations, and not the secret workings, of the disease are concerned. The indication in gout is to prevent the accumulation of uric acid in the system; and it is a poor striving for the fulfilment of that indication to cut off or limit the supply of the raw material out of which uric acid is—more or less accurately—supposed to be manufactured. We withdraw the coal instead of repairing the boiler. Is it any wonder that the "power" is reduced?

Assuming, as I think we may fairly assume, that the liver is the organ primarily at fault in gout, it is to the functional activity or inactivity of that viscus the attention of the practitioner should be mainly directed during the intervals of attack in the gouty constitution. I do not mean that there should be a fussy persistence in the exhibition of drugs reputed to "act on the liver"—or, rather, to make it act. On the contrary, there is reason to think that evil rather than good results from the habitual, or even occasional, free use of "cholagogues" in gout. We are guilty of a great oversight when we think of the liver as only or chiefly an organ of *excretion*. Bile is an excremento-recremental. The experiments of Schwann, Bidder and Schmidt, Nasse, Bernard, and, against his own theory, that of Blondlot also, have shown that animals in which the bile has been diverted after being formed,

as by a biliary fistula, die not of blood-poisoning but *starvation*. The proportion of fat in the chyle of an animal thus treated has been found to fall from 32·79 parts per 1,000 to 1·90 parts per 1,000. Fat cannot be digested, or only in very small quantities, and at best imperfectly, when the liver does not make bile freely for ingestive purposes. The greater part of the bile formed by the liver, with the biliary salts, has been proved to be absorbed as it passes down the intestines, so that the excretory function of the liver and the part which the bile plays as a stimulant to the peristaltic action of the intestines are really secondary to its main function, which is the production of a certain fluid, with saline ingredients, which plays an important part in digestion and absorption, and on the due supply of which the integrity of the chyle—that is, the perfected nutrient fluid introduced into the blood-current, and with which the organism is to be fed—directly depends. The element most largely represented in an analysis of human bile is taurocholate or choleate of soda, of which there are from 56·50 to 106·00 parts in 100,000 of bile, some 80,000 or 90,000 parts of the total being water. Chloride of sodium, and the phosphates of soda, potassa, lime, and magnesia are also present in considerable quantity. The constituents in which we are specially interested in connection with gout are the biliary salts, and particularly the taurocholate of soda and the phosphates. The biliary salts are those formed in the liver, and they are absorbed by the intestines, never appearing normally in the excreta, either fæcal or urinary, but subserving an intermediate

chemico-nutritive purpose in the system. In short, they are not excretive but secretive, and have an important part to play in the economy of alimentation. They help to absorb the fats. Besides this, however, they help to hold cholesterine in solution. This is *the* excrementitious matter which the liver—only in a secondary sense an excretory organ—evacuates from the organism. It is the ultimate product of the disassimilation of nervous tissue. It is always present in the blood and the bile, and it is held in solution by the biliary salts. The part which worry, or brain-work, or nervous excitement plays in gout is very remarkable, and a peculiar irritability of the temper is characteristic of the disease, particularly in its chronic form. This form of what Marshall Hall called “the temper disease” has been commonly attributed to the effects of pain. I confess this explanation has always appeared to me inadequate. Of late years we have come to know more about the physiology of excitement than was known even five-and-twenty years ago, and cholesterine has been shown to be, what I have just called it, the ultimate product of the disassimilation of nervous tissue. It is thus of the highest importance that it should be freely evacuated, and to this end it must be kept in solution.

It is impossible to demonstrate the fact at present, but there seems to me to be more than sufficient justification for the conjecture that it may be, in part at least, to the deficiency of the biliary salts in the gouty constitution we owe the accumulation of uric acid in the blood. Another observation to be made is that not only uric acid, but phosphoric acid, is deficient

in the urinary excretion in an early stage of gout, and phosphates of soda, potassa, lime, and magnesia form an important part of the biliary secretion which is to be taken up by the intestines.

Putting all these facts and speculations together, I believe the aim of the practitioner should be to employ the interval between attacks of gout in endeavouring to improve the function of the liver. That this is not to be accomplished by mere irritation of the liver or by any of the so-called cholagogues we know by experience. The line of treatment I have to suggest is based on the physiological proposition that the best way to stimulate an organ is to incite it to perform its proper function by doing part of its work for it; as, in the treatment of dyspepsia, we not only supply pepsine, but augment the natural secretion, by the administration of pepsine obtained from the pig. Now, if we introduce biliary salts into the intestinal canal in such form that they shall dissolve, not in the stomach, but in the duodenum, we fulfil two indications—namely, to supply the elements which the liver has not produced for general purposes, and to dissolve the cholesterine in the blood so that it may be passed to the liver in a condition to be worked off by that organ, and discharged, with the bile, into the intestines, where, under normal conditions, it is changed into stercorine, and voided with the fæces. Another effect of the administration of biliary salts during the intervals of attacks of gout is to aid the perfect solution of the fats, thus enabling them to be utilized for nutrient and heat-producing purposes in the system, instead of being crudely deposited in the

interstices of the tissues—loading the omentum for example—as so often happens in gout. In short, the administration of the biliary salts constitutes, in this class of cases at least, a valuable remedy for the corpulence so characteristic of the physical condition of a large proportion of the gouty. Taurocholate and glycocholate of soda may be readily prepared from ox- or better pig-bile by evaporating the bile to dryness, pulverizing, making an alcoholic extract, carefully filtering to remove the colouring matter, and precipitating the biliary salts by repeated additions of ether, until a permanent deposit is produced. A few grains of this deposit taken in the form of a pill with food twice or thrice daily will be found of great value, and I think it might with advantage be continuously employed by gouty persons for some months at a time until the general state indicated a permanent improvement, the urine being carefully examined, at intervals not exceeding a month, with a special view to determining the average proportion of urea excreted in twenty-four hours, and with the microscope for crystals of leucin and tyrosin, the alternative products.

In dealing with a case of gout in the intervals of the attacks, it is always desirable to regard the local deposits of urates as liable to become sources of mischief in depressed or irritable states of the constitution. There is reason to believe that in the recurrent paroxysms of gout the old deposits accumulated in previous attacks not only receive additions to their bulk, but, if they are not actually to some extent drawn again into the circulation, they become the foci of local disturbances, increase the irritative fever, and in this way do

harm. It is on all accounts better to treat them than to let them alone, and it is in the intervals of gout that local treatment proves most useful. A plan I have found to answer well is to first bathe or soak the hands or feet in water at 100° , and then to paint the thickened joints and the surface of the deposits generally with dilute acetic acid, allowing it to dry on the skin. This should be done night and morning; and while the extremities are in the water, before applying the acid, much good may be done by firmly grasping the parts and rubbing or beating them somewhat forcibly, as though to knead and soften the thickened tissues. By steady perseverance with this treatment stiff and thickened joints may not unfrequently be rendered mobile and less dense; while in cases of only slight thickening very striking results can be obtained. I do not think it is necessary to suppose that the acid is absorbed by the skin, but we know, by what happens in extreme cases, that urates have a tendency to make their way to the surface, and it is perhaps at the surface only they are acted upon by the acid. If the dilute acid of the Pharmacopœia should prove too irritating, it may be further diluted with water, but it is essential that some little redness of the skin should be produced.

As regards the general management of gouty cases in the intervals, I am convinced that it is a mistake to enforce a regulation diet or mode of life, however admirably devised the scheme may be. A full amount of exercise in the open air daily, as rich and varied a diet as the appetite demands or the palate desires, with a moderate quantity of stimulants taken with food,

will generally prove useful. It is a mistake to suppose that benefit results from what is called "moderation" in the pleasures of the table, but which is really a low diet, as generally recommended. I do not think physicians can be in full possession of the facts with regard to the lives of the persons who submit to this régime. They are anything but happy, and I am sure they are not either healthy or strong. They wander about from doctor to doctor, or try the nostrums recommended by their friends, or they settle down to a life of weakness and suffering, and not uncommonly succumb to maladies which are of very small moment in themselves, but attacking a half-starved and atonic organism prove formidable. A great deal is said and written against the evils of over-stimulation. I believe the evils and drawbacks of a life devoid of energy and, as it were, pitched at a low tone, with less than the normal amount of tension, are greater.

The practice of drinking mineral waters, such as Vichy and Vals and the like, and that of taking Carlsbad salts, Friedrichshall and Hunyadi János waters, as aperients, is, I am persuaded, injurious. If the bowels do not act daily, the precise *physical* cause of the constipation should be sought for and relieved by some change in the mode of life, or, if that be impracticable, it is better to have recourse when requisite to any ordinary mildly laxative pill. The continual drain of fluid from the blood kept up by the habitual use of saline waters tends to the crystallization of the uric acid. It is well to drink freely of plain water, light hock, or weak tea with a dash of lemon juice. The kidney secretion can be kept free by this habit, and in that

way the uric acid, or sodium urate, may be prevented from accumulating. In some cases I have found beneficial results from the occasional use of the iodine mixture, previously mentioned, during the intervals of the attacks, a dose being taken once daily—after breakfast—for a week or fortnight, when the general state seems in any way unsatisfactory; but the taurocholate of soda pills usually fulfil every requirement, and to the use of these I would advise the practitioner to keep his gouty patient until the urinary excretion has for several successive months shown that the process of disassimilation is satisfactorily performed. Then he may safely write him off the sick list, and, in so doing, the less he says about diet and regimen the greater will be the chance of a speedy and permanent cure. Need I apologize for speaking of the “cure” of gout? Such an expression is confessedly out of harmony with the prevailing view of this malady, but I would be forgiven for suggesting that the view prevailing may be neither well founded nor correct.

CHAPTER V.

CHRONIC GOUT.

CHRONIC gout does not stand in the relation to acute gout which the chronic form bears to the acute form in the majority of morbid affections. It is practically a different disease, although arising from the same cause. An excess of uric acid, either by over-production or deficient discharge, is the proximate cause of both maladies, but the effects of this excess in the one case differs markedly from those manifested in the other. Chronic gout, properly so-called, is not necessarily paroxysmal in its development, though exacerbations commonly occur at irregular intervals. There does not, however, appear to be that sudden blocking of the renal tubes which there is reason to believe forms the exciting cause of the attack in acute gout. There would rather seem to be in chronic gout a persistent error of function, with continuous over-production or non-destruction or re-absorption of uric acid, and a more or less constant extrusion of this material by wrong channels, or in the form of interstitial deposits among the tissues. In some extreme cases of this disease vast accumulations of a semi-purulent mortar-like substance, chiefly composed of urates, form around joints or in dependent and distensible parts of the body, not unlike the cold abscesses which characterize

certain varieties of scrofulous diseases. It does not, however, appear that these gouty formations take place in the glands, and the lymphatic system is only in a secondary way affected by them. Instances must be familiar to most practitioners in which, on opening the large puffy or fluctuating swellings of this nature in advanced cases of chronic gout, semi-fluid matters of the description named have escaped, to the extent of half a pint or more. The sufferings attendant on this form of gout are sometimes so terrible and exhausting that life is barely endurable. In other cases there is comparatively little actual pain, the misery of chronic low health and wearing indigestion being the chief results of the morbid condition.

It is rare to meet with a case of chronic gout which is not complicated with, or by, some other constitutional malady. It is this combination of evils, probably, which gives chronic gout its distinctive character. Either there is struma, or syphilis, or some other morbid state, and the dyscrasia which results combines the features and effects of both without conforming to the type of either; while intercurrent acute or constitutional disorders occurring in the course of the illness present anomalous features and induce observers to call their phenomena by new names. In this way we come to hear of "new diseases"—for example, the special affection of the joints which has recently attracted so much attention and awakened such interest and enterprise in England, of which Professor Charcot, of Paris, was the first clinical recorder, and with which, justly enough, his name has been associated. I confess that I am unable to regard Charcot's disease

as either new or mysterious. It appears to be the by no means rare result of grafting syphilitic tabes on hereditary gout; and this is why I mention it here. It would be presumption on my part to traverse the propositions laid down by Professor Charcot as to the nature of the disease. From his point of view the clinical features of the malady are these: In a case of locomotor ataxia, generally somewhat advanced, there occur hydrarthrosis and tumefaction, with engorgement, producing a hard swelling. There is not necessarily any evidence of lesion within the joint, which may be that of the knee, the shoulder, the elbow, the hip, or the wrist, and the probabilities of selection are as regards the several joints in the order stated. After some months the tumefaction may subside, either leaving the joint free of abnormal appearances or with symptoms of enarthritic disease, such as imperfect movement or even dislocation. It is my contention that these symptoms occur only or chiefly in cases where there is an inheritance of gout, and that they indicate a form of what Mason Good called arthrosia hydrarthrosia, which has been recognized since the time of Swediaur. The special manifestations described by Charcot are doubtless of great interest in a pathological sense, but, as we are now studying gout from the strictly clinical standpoint, it is only necessary to observe that a condition closely resembling "Charcot's disease" is not very uncommon in chronic gout, particularly when accompanied by nerve disturbances. I do not for a moment doubt that the particular state set up is of nervous origin, and it may well be that a special centre in the medulla is affected, but I think it re-

quires the combination of gout plus syphilis and nerve disturbance to produce the phenomena described.

There are as many varieties of the deposit of gouty material as there are possibilities of its being thrown down. It may be effused about joints in the deeper tissues surrounding the ligaments, or in the ligamentous envelopes and structures of the joints themselves; in the cartilages in the perichondri of non-articular surfaces on either side of the synovial membranes, between the cartilages and their investing membranes ulcerating through them and roughening the articular surfaces; or the urates may be deposited within the synovial sacs, just as what are called "chalky" concretions are sometimes thrown out in the pleural cavity. The gouty material may also be deposited in the substance of the cartilages outside the cells, pressing upon these and causing their absorption; or it may be effused into the cancellous structure at the ends of the bones and into the Haversian canals, though this last mode or place of deposit is probably rare. It has also been found deposited in the prevertebral fascia. It is, perhaps, worth considering whether there is not some connection between the lymphatic function and the pouring out of urates and purulent lymph in at least one form, or variety, of the gouty dyscrasia. It is true that in the more acute forms of gout the lymphatic system does not seem to be involved, but chronic gout differs so widely from acute gout that in the chronic form lymphatic derangement may perhaps sometimes play a definitive part.

These several familiar forms of chronic gout, and some that are not so well recognized, although the affections to which they give rise are common maladies,

partake of the same essential character. Instead of sharp attacks of pain and febrile disturbance accompanying, or produced by, the sudden effusion of gouty material at some point and subsiding when the first irritative fever is allayed by its own exhaustion or by the greater tolerance of the organism, or when the deposit is either re-absorbed or left like a foreign substance in its new bed, which phenomena constitute an attack of acute gout, there is in chronic gout a gradual, and almost tolerated and non-inflammatory, extrusion of urates around the joints. Of course these deposits are not absolutely tolerated, and they *do* set up local inflammation, but there is no shock or irritative fever, or, if there be any, it is of low type, and the local symptoms are those of a growing disability to move the joints, with pain of a dull aching sort rather than severely acute, and puffy, or sometimes very firm, œdematous swellings of the parts affected, which are not generally very hot, although they are the seats of venous congestion, as shown by the distension of the local veins—a very important symptom of chronic gout.

The deposit of urates may occur elsewhere than around the joints. Small tophi (or calcareous masses) may be formed anywhere. They are usually found immediately under the cuticle covering the cartilage of the external ear. It is a very usual, though not an indispensable, characteristic of these deposits that the blood-vessels closely adjacent to and surrounding them are varicose. It often happens that minute deposits of this nature are formed in near proximity to cutaneous nerves, causing severe neuralgia, for the relief of which local measures must be directed to the

deposits, however small these may be, rather than to the seat of the pain. Side by side with the local symptoms of chronic gout, which may range from the slightest stiffening to actual deformity, from small deposits to the effusion of vast quantities of urates with imperfectly formed lymph, pressing upon and destroying the adjacent tissues and constituting large abscesses, there are the symptoms of the general disease of which these local disturbances are the contingent results. The sodium urate in the blood is itself an irritant, and sets up a malaise which is distressing in its nature and development. It is usually worse in the morning, as though, when his circulation quickened on assuming the erect position, the sufferer experienced the effect of an accumulative irritating poison in his blood. This morning illness in chronic gout is not sufficiently noted. I believe it constitutes one of the earliest premonitory symptoms of the malady, and should suggest the expediency of an instant search for hereditary influences when it presents itself. Long before the recognized manifestations of the affection declare themselves, patients complain of feeling ill in the morning: the eyes are heavy, the heart palpitates or is oppressed, there is a feeling of weight over the chest, flying pains are felt in the limbs and joints, there is no appetite or there is nausea, the bowels are confined or move with difficulty. Piles are occasionally present, and trouble the sufferer, who is conscious of depression and irritability to an extent that makes life a burden. Atonic dilatation of the stomach is a very common symptom at this early stage of the malady, and, as a consequence, there is distension, weight, and pain at

the epigastrium, often with the symptoms of acid dyspepsia, sometimes so aggravated as to suggest the possibility of ulcer of the stomach. In females these gastric and associated symptoms, worse in the morning, but repeated after late meals of the day, are very common, and give rise to diverse diagnoses, which occasion needless alarms, and not unfrequently lead to the adoption of most undesirable modes of treatment, the symptoms being supposed to arise from uterine disturbance, whereas they are the effects of incipient gout.

There is no sufficient reason why certain forms of chronic gout should be classed as "atonic" or "anomalous." It is a mistake to attribute every anomalous malady to gout, but it is a greater blunder still to omit the necessary investigation for hereditary gout in all cases of an unexplained or obscure character, for, as a matter of fact, in England at least, gout is, beyond question, the commonest of underlying causes of a weakly or depressed performance of the functions of organic life. If there be a history of gout in a family, and if the illness, whatever form it may take, subside with discharge of urates in the urine, I think we are not only justified in recognizing the malady as of gouty origin, but bound to treat it as such.

In chronic gout the information to be obtained by frequent analyses of the urine is absolutely indispensable to an intelligent management of the case. The urine of twenty-four hours being collected and measured, and a specimen submitted to the practitioner, he should not content himself with the ordinary tests for albumen and sugar, though these ought on no account to be omitted, but the proportion per ounce of

the urea should be ascertained and carefully considered in the light thrown on the excretion by the total quantity of the urine passed and its specific gravity. Search must also be made with the microscope for crystals of uric acid, &c. I cannot too strongly insist on the need of watching the kidney excretions carefully in these cases. In cases which keep the patient under observation, an examination should be made at least once a week; in other cases once a fortnight. In no case of chronic gout ought the urine to be left without careful examination for longer than three weeks, or a month as the extreme period. To undertake the management of a case of this sort without this precaution is like attempting to pilot a heavily laden ship through a difficult channel with shifting banks, without frequent soundings.

The medical treatment, properly so-called, must consist of two parts—the local and general. The best measures of a topical kind I find to be the simplest. Soaking the parts in water about the temperature of 100° Fah., in which seaweed (the kelp or pod weed) has been infused for some ten minutes or a quarter of an hour, and then gently rubbing them *or* percussing them with an apparatus which will give a number of gentle taps (not less than fifty or sixty in the second), is a method which has in many cases produced very marked results both by way of relieving pain, increasing the mobility of the joints and inducing the absorption of the deposits. Until quite recently I thought this method, which I have recommended and myself tried extensively, and with great success, was new; but I now find that

it was pursued as far back as the time of Mason Good, and is mentioned in his "Study of Medicine" as part of the method of Dr. Balfour. That physician proposed to compress the gouty part forcibly, and then to adopt a "gentle percussion." The compression is useless, and must prove irritating; the percussion, if extremely light, and applied with a smooth disk of vulcanite or soft wood worked by a mechanical or electro-motor percuteur* at a high speed, is most grateful to the feelings of the patient, and certainly contributes to the recovery of the affected part. Friction of the surface does not seem to produce any permanent results. I have not seen beneficial effects following painting the surface with iodine, except in cases of effusion into the joints where there was no increase of temperature discoverable with the surface thermometer. If there be any local heat or inflammation, I think the external use of iodine does harm. The same remark must be made with reference to the practice of encasing a gouty joint with wet rags and oil-silk or other waterproof material, in fact, poulticing the parts—even with a solution of carbonate of lithia. I think this treatment, in all its variations, in the long run aggravates, although it may give temporary relief. It debilitates the vessels and increases the tendency to œdema; whilst drawing blood to the parts and relaxing the tissues it tends to favour the deposit of urates, which, in fact, is the whole cause of the local trouble. Better results are obtained by soaking the limb in water at the temperature

* As figured and described in "Nerve Vibration," &c. (Churchill.)

of 100°, and then pouring cold water on the surface so as to contract the vessels. The region in which the deposits have taken place should be kept cool, and joints should, as far as possible, be freely used. Compression by tight stockings, boots, or wraps of any kind is bad. It retards the flow of blood through the vessels of the part, and favours the deposit of the urates. The muscles should be allowed or induced to work naturally, so as to aid the return of blood from distant points, and to maintain the lymphatic circulation. Just enough support to prevent the dilatation of the veins by the blood-current, and to encourage them to empty themselves, is what is wanted, not compression. For this reason all rubbings of gouty parts should be performed *gently*, and *towards the heart*.

The general medical treatment of chronic gout should, I think, consist in an endeavour to incite the liver to the performance of its proper function and the fulfilment of such general indications as I have noted as being present in the intervals of attacks of acute gout, special paroxysms of pain being treated on the general principle set forth when speaking of "the attack." The mixture of ammonium chloride with iodine (a formula for which will be found in Part II.) is likely to be useful once or twice daily whenever the urea is deficient in proportional quantity. It should be given much diluted, and after food. When the urea is coming away freely the valerianate of soda in infusion of serpentary may be taken with advantage. After a very few successive examinations of the urine in any one case the practitioner will be able to determine how much *ought* to be excreted. I find the propor-

tions vary greatly with the individual. Some patients are in good health with an excretion of eight or nine grs. per oz.; while others are not even passably well unless they secrete ten or twelve grs. The difference is doubtless in the main due to the relative proportion which the disassimilation of actually utilized material bears to the total of assimilation and to the quantity of food consumed, the waste being derived from the blood rather than the tissues. This relative proportion is dependent on the habits of life. Nevertheless, instead of trying to adapt the diet to a theoretical standard of needs, rather strive to make the excretion of urea fulfil the requirements of health. This is, I am sure, a maxim worthy the attention of practitioners who desire to see their gouty patients live long and happy lives.

CHAPTER VI.

RHEUMATIC, OR "FLYING," GOUT.

THE relations of likeness and difference between gout and rheumatism are not yet defined. Those who regard these affections as wholly distinct set forth as diagnostic characteristics of the two diseases that gout seldom occurs until after thirty, whereas rheumatism may occur at any age; that gout attacks a single joint or only the smaller articulations, producing redness and exfoliation of the cuticle, and leaving deposits of urate of sodium, while on the other hand rheumatism assails the larger joints by preference, and, inflaming them, generally without redness of the surface, produces rapid effusion, and a fluctuating rather than a resisting swelling. Moreover, they describe as pathognomonic of rheumatism a profuse, abnormal, and acrid perspiration.

These distinctive features are not available for diagnostic purposes in a certain class of cases, however great may be their value in others. There is a form of gout which approximates so closely to rheumatism of the subacute arthritic or fugitive sort that it has been called rheumatic or flying gout. For practical uses it would be almost enough to describe this variety of the disease we are considering as rheumatism occurring in gouty persons. The accession of the malady is very often preceded by a rigor, and

easily ascribable to the effects of cold. It rapidly produces a puffy and painful swelling around some joint, which is as likely to be the knee, or elbow, or shoulder, as any other. The toes may be affected later on, but a large joint is usually the first to suffer. There is generally an erysipelatous redness of the skin of the part inflamed, and the swelling soon becomes firm to the touch. The subcutaneous connective tissue is the seat of acute inflammation, and effusion quickly takes place into its interspaces; the urates probably being deposited later in the attack than the outpouring of serum and, perhaps, fibrinous lymph. There may be effusion into the synovial cavities as in deforming articular rheumatism, and then there will be perceptible crepitation when the hand is laid on the joint and one of the articular surfaces gently moved. In short, the malady combines the familiar characteristic features of both "gout" and "rheumatism," as these two diseases are generally understood, so that there is ample excuse for the designation "rheumatic gout," albeit the term is clearly unscientific.

Without presuming to discuss the relations of gout and rheumatism, I may be permitted to suggest that there is no reason why a gouty person should not be attacked with acute or subacute rheumatism. And if this should happen, it is not only possible, but probable, that the symptoms produced would, to a large extent, combine the leading features of the two maladies. We know that in the formation of vesical calculi changes of state produce deposits of different natures in successive layers, so that the composition of the stone is often not homogeneous, but stratified with

diverse elements. In the same way, surely, uric and lactic acid disturbances may occur successively in the same patient, producing respectively gout, which is likely to be the hereditary and underlying cachexia, and rheumatism. Again, it is readily conceivable that tissues which have been once weakened by rheumatic inflammation may present specially assailable points when an attack of gout subsequently occurs; or if a person who inherits, but has not yet developed, gout should contract rheumatism either in the acute or sub-acute form, this may wake up the gouty tendency. Thus there are several ways in which it may not unnaturally come to pass that we find cases neither gouty nor rheumatic, but offering strong points of resemblance to both.

Rheumatic or flying gout may be either a comparatively trivial or a very severe affection. Well-marked cases of the class occurring in decidedly gouty constitutions not uncommonly commence with what is supposed to be lumbago, but which I believe to be inflammation of the tendinous and ligamentous structures in the lumbar region of the vertebral column and extending to the posterior spine of the ilium. In some exceptionally severe cases the sacro-iliac synchondrosis may be involved. In others the inflammation may attack the prevertebral fascia or the intervertebral cartilages, or, extending up the spine, it may affect the articulations of the ribs. It is even possible that, as in rheumatism, the symphysis pubis may be the seat of inflammation. When rheumatic gout commences in this way the diagnosis is difficult, and grave affections of very different natures may be simulated. Many

attacks of gout resembling rheumatism are of so slight a character that they pass for somewhat severe myalgia ; while others are more intense from the commencement, and run the course of subacute or chronic or even acute rheumatism. There is also in certain of these cases, particularly at the outset, a great deal of perspiration and much else that makes the rheumatic element more conspicuous than the gouty. Later on in the illness the true nature of the malady is likely to become more clearly marked. Instead of mere effusion of serum, readily, though not always rapidly, absorbed, or fibrinous adhesions, as in chronic rheumatic arthritis, there may be tophi ; sometimes, in addition to these, there are thickenings and stretchings of the cutaneous and subcutaneous tissues around or near the joints, forming pouches, which remain for months or permanently, and occasionally contain small gritty particles, perceptibly grating to the touch. These concretions embedded in loose tissue are not less pathognomonic of gout than the more familiar "chalk stones."

It is important to recognize two distinct forms of this malady. 1. One in which the attack resembles an attack of acute rheumatism or of acute gout—presenting, as I have said, an anomalous mixture of the characteristic symptoms of both these maladies—but decidedly sthenic in its character, and distinguished by a rapid rise of temperature, ranging from 102° to 104° , in proportion to the number of parts affected and the severity of the pain and general disturbance, with furred tongue, skin at first dry and hot, then covered with profuse perspiration, scanty

urine highly coloured and commonly loaded with urates, as in rheumatism; not, however, because the urates are really in excess, or even sufficient, but because the total quantity of water passed is so small that its solid ingredients are thrown out and deposited. There is doubtless a great deal of destruction of tissue in this form of rheumatic gout, and there may be much débris of consumed tissues to come away, but this discharge, being intercurrent with the attack, will not relieve the state of uric acid accumulation which perhaps preceded the paroxysms and caused it. The point to notice is that when a rheumatic "fever" of this sort occurs in a gouty subject it does not necessarily relieve the gout, although the attack is so modified by the gouty diathesis as to make the malady "rheumatic gout" instead of "rheumatism."

2. The other form of the disease to distinguish is a sub-acute or chronic affection, which, without febrile disturbance other than a sort of hectic, produces progressive deformity, but not precisely in the same way as, or with results identical with those of, chronic gout. What used to be called arthrosia hydrarthrosis, or white swelling of the entonic or sthenic class, is common in gouty subjects. This may not, at first sight, be apparent, but on consideration it will be found to be the fact. It must not be confounded with the white swelling caused by inflammation of bursæ, so common to persons who kneel much, or with the traumatic synovitis which results from "jerks" or injuries to the articulation itself, or again with the joint affections familiar in connection with the strumous constitution. It is a distinctly "rheumatic" malady—*i.e.*, in the popular

sense—as it is, almost invariably, induced by cold or damp, or both. The diagnosis is not easily made without the aid of a history placing beyond doubt that gout exists in the family and has been inherited by the patient. When, however, this important evidence is forthcoming it will be found that the clinical features of the case are not wanting in distinguishing characteristics, and such cases require to be treated for gout as well as rheumatism if they are to be successfully relieved.

In all varieties of this combination of gout and rheumatism the urine should be carefully examined from time to time both for urea and for uric acid, and the treatment should consist in the exhibition of remedies appropriate to the elimination of the urates. Locally the best measure of relief, whether in the acute form or in the subacute or chronic, consists in the application of heat locally. A basin of very hot water being placed under the joint so that the steam may envelop it, the water is to be lifted with a sponge and allowed to *run over it* at as high a temperature as can be borne. This fomentation or bathing should be kept up for ten minutes continuously several times daily, the part being loosely swathed in hot dry flannel in the intervals. Never allow a gouty joint to be so wrapped that evaporation cannot take place. All waterproof, and heat- and vapour-confining, coverings are harmful. I have found nothing to equal this simple application as a means of affording permanent relief for pain and the gradual reduction of swelling. If the circulation be maintained freely through the smaller vessels and capillaries of the part, even though the local tempera-

ture be high, there is diminished probability of effusion or deposit, or if these should occur they will be taken up again and the tissues left free. The hot-air bath applied locally with a lamp under the bed-clothes is not, in my experience, so effective, as the direct fomentation and bathing, for the relief of the local pain and tension. If, however, there be either a very dry skin or hot perspiration, which last seems to indicate that there is determination of the blood-irritant to the skin, the lamp bath may be useful, and I have in cases of these two last-mentioned classes—those with the very hot dry skins and those with hot perspiration—obtained good results with its aid. I think the indications for this encouragement of the cutaneous activity are, first, the presence of a not too rapid and sufficiently strong pulse, and, second, the passing of a fair quantity of urine, not less than three pints in the twenty-four hours, with a free discharge of urates. If the urine be either very scanty or deficient in urates it is necessary to direct the flow of fluid to the kidney and to discourage the action of the skin. It is needful to bear the fact previously recorded constantly in memory—namely, that the urates may be proportionally large in a reduced quantity of urine, and lead to the belief that the amount discharged is considerable, whereas, perhaps, the total quantity is small. In all cases of scanty or high-coloured urine the region of the bladder above the pubis should be carefully explored for extended dulness produced by retention, and for tenderness on pressure indicating local inflammation. If the bowels are not acting *sufficiently*, a dose of some mild aperient will be desirable, and there is nothing

better than half an ounce of *castor oil*, or if this cannot be taken, one of the saline draughts suggested in Part II.

The general indications in rheumatic gout are, I think, best fulfilled by the administration of a powerful "febrifuge," to use an old term, that is, a depressant of the heart's action [*e.g.*, *aconite*], with an alkali. (See formula, Part II.) This is necessary in a severely acute case with rapid pulse, hot skin, scanty urine, throbbing temples, headache, thirst, and dry tongue. Encourage the patient to drink freely of warm diluents, such as thin mutton-broth, weak tea, or any other beverage which may be fancied, until the blood pressure generally is first raised, then reduced, and a full flow of urine is freely established. If the feverish symptoms be less intense or even atonic, or if the heart's action is weak and the first sound be relatively wanting in force, or if the tongue be dry, or dark, or broad and much indented by the teeth, and the hand trembles when held up by the wrist, it is desirable to give a stimulant, and the best form in which to exhibit it will probably be champagne. Stimulants are not, in my experience, so frequently required early in a case of rheumatic gout as in one of gout simple. The heart always requires to be watched carefully for rubbing sounds or other indications of irritation and incipient inflammation, for the blood is apt to be loaded with fibrin as well as uric acid. This contingency, however, occurs less frequently with the *aconite* treatment recommended in Part II. than with any other of which I have experience. I confess, for myself, I do not feel confidence in the use of *salicin* [or *salicylic acid*], as both the heart

and the kidney may be affected under this treatment, while the malady appears to be relieved. If, however, any one desires to have recourse to it the formula will be found in Part II. The practitioner should not omit to test the urine with a persalt of iron at each visit, to assure himself that the drug, which is apt to be detained and accumulate, is passing away as salicylic acid, or salicyl hydride. The reaction will be purple-red.

As regards the use of anodynes, I confess that it is my policy to avoid them. If they seem to be indicated by severe pain which the general and local measures already suggested will not relieve, it is better to give a special dose of Dover's powder or a few drops of laudanum, or hyoscyamus, or succus conii as occasion may require than to administer sedatives regularly. In the insomnia of acute disease, as in that which occurs in comparative health, I am sure it is far better to search out the specific cause, and try to treat that, than to give soporifics as a routine measure. In subacute cases it will suffice for general purposes to give a saline diuretic—not diaphoretic—or nitrate of potass may be combined with the carbonate as suggested in Part II. Chronic cases not unfrequently do well with the lemon-juice treatment, the expressed juice of a fresh lemon being given in half a tumbler of water every fourth or sixth hour. In rheumatic gout, great benefit often also results from the use of the iodine mixture already described. (For formula see Part II.) When the general symptoms have subsided, and only stiffness, with perhaps thickening and some deposit, remains, fomentations with very hot water should be continued

twice or thrice daily, and the affected parts rubbed gently but firmly with a warm hand *towards the heart* so as not to distend the veins, warm flannel wraps not too thick, and quite loose, being worn in the intervals. Later on, kelp baths, and sea-bathing, will be advantageous. The aim should be to restore the tone of the vessels of the part which has been once affected, so that it may not again attract the disease by its weakness. To this end it is desirable as soon as the health is fairly re-established to dispense with extra clothing, and to promote a brisk circulation by cold affusions and exercise.

CHAPTER VII.

SUPPRESSED AND RETROCEDENT GOUT.

WHEN, in a gouty constitution, an attack or paroxysm of the malady is imminent by reason of the accumulation of uric acid or sodium urate in the blood, or whatever else may be the exciting cause of an outbreak, it depends entirely upon the general state whether the determination—so to say—shall be towards an extremity or some internal part of the organism. I am not now speaking of cases in which the condition of the body as a whole is such that the disease does not rise to the height of a full inflammatory affection; that class of cases will be mentioned presently. In the suppressed and retrocedent forms of the malady there is a high grade of specific morbid energy, but, instead of attacking a joint, the disease, for some reason, seizes upon an internal organ, and delivers the full force of its attack on that structure. Cullen, who had very “advanced” views of gout, made a distinction between the *retrocedent* form in which, “when an inflammatory state of the joints has, in the usual manner, come on, but which, without arising to the ordinary degree of pain and inflammation, or, at least, without these continuing for the usual time, and receding gradually in the usual manner, they suddenly and entirely cease, while some internal part becomes affected,” and the *misplaced* form of gout which, as he argued,

“the gouty diathesis, instead of producing the inflammatory affection of the joints, produces an inflammatory affection of some internal part.” He, however, takes the force out of his own discrimination by immediately observing, “Whether the gouty diathesis does ever produce such inflammation of the internal parts, without having first produced it in the joints, or if the inflammation of the internal part be always a translation from the joints previously affected, I dare not determine;” and then he adds, “Even supposing the latter to be always the case, I think the difference of the affection of the internal part must still distinguish the misplaced from that which I have named retrocedent gout.” For clinical purposes it is convenient to discriminate between the sthenic gout that attacks internal organs, whether it has first assailed the joints and retroceded or centred at once in the deeper parts of the organism, considering it as suppressed and including retrocedent; and that form of gout which does not develop characteristic symptoms, and may therefore be called undeveloped or irregular, of which we will speak in the next chapter. Why sthenic gout should first seize upon, or be suppressed in, an internal organ, or, having attacked an external part, suddenly recede, is not evident. Cullen, who, as I have said, held very advanced views, laid it down that this disease invariably attacks the weakest part of the organism, and there is much to favour such a theory. It may perhaps explain what I have called suppression or retrocession, or it may be that an external interruptive and repressive influence sometimes interposes.

We have heard a great deal of late of the "nervous" hypothesis of gout, which has been put forth as a novelty. That it has no claim to this distinction will be apparent from the following passage, which I quote for another purpose from Cullen's "Practice of Physic" (1784). After formally rejecting on nine grounds the hypothesis that gout "depends upon a certain morbid matter always present in the body; and that this matter, by certain causes, thrown upon the joints or other parts, produces the several phenomena of the disease," the author proceeds to allege "that the gout is a disease of the whole system, or depends upon a certain general conformation and state of the body. . . . But the general state of the system depends chiefly upon the state of its primary moving powers; and therefore the gout may be supposed to be chiefly an affection of these." And then he proceeds thus (vol. ii. p. 83):—"My second observation is, that the gout is manifestly an affection of the nervous system, in which the primary moving powers of the whole system are lodged. The occasional or exciting causes are almost all such as act directly upon the nerves and nervous system; and the greater part of the symptoms of the atonic or retrocedent gout are manifestly affections of the same system. This leads us to seek for an explanation of the whole of the disease in the laws of the nervous system, and particularly in the changes which may happen in the balance of its several parts." He then argues that the stomach "is the internal part that is the most frequently, and often very considerably, affected by the gout. The paroxysms of the disease are commonly preceded by an affection

of the stomach ; many of the exciting causes act first upon the stomach ; and the symptoms of the atonic and retrocedent gout are most commonly and chiefly affections of the same organ." Cullen then offers his pathology of the gout (pp. 85-88, op. sup. cit.), which, less for its etiological than for its *practical clinical* value, I think it worth while to reproduce. "In some persons there is a certain vigorous and plethoric state of the system which, at a certain period of life, is liable to a loss of tone in the extremities. This is in some measure communicated to the whole system, but appears more especially in the functions of the stomach. When this loss of tone occurs while the energy of the brain still retains its vigour, the *vis medicatrix naturæ* is excited to restore the tone of the parts ; and accomplishes it by exciting an inflammatory affection in some part of the extremities. When this has subsisted for some days, the tone of the extremities, and of the whole system, are restored, and the patient returns to his ordinary state of health. This is the course of things in the ordinary form of the disease, which we name the *regular gout* ; but there are circumstances of the body, in which this course is interrupted or varied. Thus, when the atony has taken place, if the reaction do not succeed, the atony continues in the stomach, or perhaps in other internal parts, and produces that state which we have, for reasons now obvious, named *atonic gout*. A second case of variation in the course of the gout is, when, to the atony, the reaction and inflammation have to a certain degree succeeded, but, from causes either internal or external, the tone of the extremities, and

perhaps of the whole system, is weakened ; so that the inflammatory state, before it had either proceeded to the degree, or continued for the time, requisite for restoring the tone of the system, suddenly and entirely ceases. Hence the stomach, and other internal parts, relapse into the state of atony ; and perhaps have this increased by the atony communicated from the extremities : all which appears in what we have termed the *retrocedent gout*. A third case of variation from the ordinary course of the gout, is, when, to the atony usually preceding, an inflammatory reaction fully succeeds : but has its usual determination to the joints by some circumstance prevented, and is therefore directed to an internal part, where it produces an inflammatory affection, and that state of things which we have named the *misplaced gout*."

This hypothesis, vague as it necessarily is, seeing that, at the time Cullen wrote, comparatively little was known of the nervous system, fits in strikingly well with our more precise views, and may, with very little change of terms, be adopted to embody the presumption on which the misplacement of the gouty inflammation, whether by suppression, retrocession, or metastasis, is now explained. Either by a temporary disturbance of what Cullen called "the balance" of nervous power, or by organic defect or peculiarity of structure, the organ which receives the attack at the outset, or upon which the disease falls back suddenly in its course, is a *weak point*. In short, gout attacks weak points, whether they be bunions produced by the pressure of tight boots, or broken legs, or diseased internal organs. Thus it is because the feet are the

most dependent parts, and the veins around the joints interlace so that the blood-current is retarded, the lower extremities are commonly attacked; and it is because the flow of the blood-current is reduced when the body is supine at night and the rhythmical contractions of the heart number something like eight or ten per minute less than they do when it is erect, the attack commonly commences at night. We may, therefore, take it for granted that an attack of gout is likely to be suppressed or recede in proportion as the vital powers are low; and it follows, on the one hand, that a too lowering method of management and treatment is contra-indicated in gout; and, on the other, that the indication for relief in cases of suppression, retrocession, or metastasis is to stimulate; and that the restorative stimulation must be not simply general to the system as a whole, but be specifically directed to the organ in which the gout has been, so to say, intercepted or suppressed, or upon which it has receded.

If in a case of gouty diathesis an attack resembling gout occur in the night, but is not followed by inflammation in the region of some joint, or if after the ordinary symptoms of gouty inflammation have appeared in an extremity the pain, and redness, and swelling suddenly subside, we may suspect, and ought to assume, that some internal organ has been attacked. It is in either of such cases imperative to explore the state of every organ until we discover the lurking-place of the enemy. Sometimes pain or disturbance of function will at once reveal the new seat of the gout, but it is not safe to expect this revelation or, even, if it seem to be made, to

trust its completeness. For example, many a case of suppressed or retrocedent gout has done badly because, believing the sickness and sense of cold and weight at the epigastrium commonly experienced by a patient in whom gout has receded, to prove that the new location of the disease was in the stomach, the practitioner has overlooked a graver incidence of the gouty inflammation upon the heart or kidney. It is better not to try to formulate sets or series of symptoms which may be supposed to show that such and such organs are affected. For clinical purposes groupings of signs and symptoms are not merely untrustworthy, but often misleading. Thus sudden pain in the epigastrium and sickness do not necessarily, although they may generally, denote that the stomach is affected. Nor does a jaundiced complexion, with collapse, always point to metastasis to the liver. The rule should be, whenever, or however, gouty symptoms subside suddenly, to explore each and all of the organs of the body. The stomach, the liver, the spleen, the heart, the kidney, the bladder, the brain, the spinal cord, or the cerebro-spinal meninges may be the new place to which the gout has been translated, or, in other words—as atonic congestion of the lungs may, and often does, occur suddenly in the course of fever—congestion of any organ may occur suddenly in gout; and there will be discernible, *if we look for them*, the usual physical signs of congestion with a certain amount of pain and disturbance of function in the organ newly attacked. It must, moreover, be borne in mind that, as the pain attendant on gout is in great part a result of the mechanical straining or distortion of rigid and inelastic tissues by

the sudden outpouring of an effusion in their inter-spaces or in such fashion as to compress them, it is not to be expected that the pain consequent upon gouty congestion and inflammation of an organ of loose and expansive tissue, or one not freely supplied with sensitive nerves, will be as severe as that consequent upon swellings which stretch or squeeze the nerves of the highly sensitive skin. This is an additional reason why the symptoms of suppression or retrocession in gout should be looked for in all parts of the organism, instead of being disregarded, or forgotten, because they do not declare themselves. *Always expect the worst in sudden ameliorations of gout, and search for evidences of internal mischief.*

The treatment of suppressed or retrocedent gout must, as I have hinted, consist in the adoption of measures for the remedy of local organic congestions. Counter-irritation is the sheet-anchor, and clinical experience seems to show that it is better to apply general principles of treatment for the prompt relief of the organ affected than to trust to the excitation of distant parts of the organism—*e.g.*, the extremities—on the chance that the gout may be called back to what we have come to regard as its normal situation. The general plan of medication must be stimulating, the diet nutritious, the remedies administered restorative. In Part II. I have classified a number of formulæ for employment in the different varieties of misplaced gout, when there has been suppression and when there has been retrocession respectively.

CHAPTER VIII.

UNDEVELOPED, OR IRREGULAR, GOUT.

UNDER this heading may be comprised all those errors of function and morbid states, whether of sensation or motion, which arise out of the gouty constitution or diathesis, but are not either associated with, or dependent upon, or produced by, attacks or paroxysms, acute, subacute, or chronic, of the fully developed disease. In short, the gout is undeveloped, but from its morbid influence spring troubles which are more or less specific although the underlying malady does not otherwise declare itself. As a rule, undeveloped or irregular gout is the appanage of the subordinate members of gouty families, and chiefly affects the alternate or third generations. It is also principally, though not exclusively, the estate of males. The females of gouty families have a morbid inheritance of their own, concerning which there will be something to say later on. So far as my experience goes, the more prominent examples of this form of gout are to be found in those who inherit the disease obliquely—that is, when it has descended from mother to son or from father to daughter. In clear cases of atavism, however, irregular gout is often found in the direct line; but not uncommonly, when this is the fact, the second generation exhibits undeveloped or irregular gout, and the third develops

the disease in its typical form and with its full characteristics.

I would venture to suggest that, in a considerable proportion of instances, the fact that inherited gout is undeveloped or irregular in its form is traceable to one of two causes: either there has been a radical change in the habits of life of the family so that the generation in which the disease is not regularly developed does not fulfil the conditions of its development, that is to say, the conditions of development established by organized habit; or there has been an important introduction of what breeders know as a new "strain" into the family by marriage. There is, I think, no room for doubt that as some types of organism and temperament are specially prone to take on the gouty habit, others are organically antagonistic to it, not merely unlikely to become gouty, but disposed, in virtue of peculiarities of structure and habit, to exhibit contradictory tendencies. When an individual of some stock strongly marked with this anti-gout characteristic is introduced into a gouty family, the entail of disease is not cut off, but for the next generation, or perhaps two generations, there may be repression or arrest of development so far as to prevent the disease from presenting its proper characteristics, and it therefore assumes irregular forms. It does not follow that this introduction of "new blood" has been a gain to the family, for some morbid quality may have been grafted upon the old stock, and the net result is perhaps disadvantageous. I am inclined to think that there is much force in the contention of Cullen, that irregular gout is really atonic.

If this be so, it is easy to understand that the ano-

malous forms of gout are for the most part expressions of defect or debility. This I take to be the key to the interpretation of obscure cases of undeveloped gout. I do not think it is possible to say of any special disorder or affection that it is gouty unless there either be a distinct history of gout in the family or the trouble, whatever it may be, whose nature is in question has one almost pathognomonic characteristic—namely, that it is relieved by, or its subsidence is closely associated with, a copious discharge of urates in the urine. There are many common forms or varieties of undeveloped or irregular gout which it is important to recognize in daily practice, and it will be necessary to say a few words on each ; but what I have to observe shall be compressed into the smallest practicable compass. We will take them as nearly as possible in the order of the frequency of their occurrence.

GOUTY OBESITY.

This is, I think, the most commonly occurring, and yet the least familiar, form of irregular gout. It is a well-known fact that gouty persons are very often fat ; and it must have been noticed by observers generally that there is special coarseness in the way the adipose tissue is apt to be deposited in these cases. It forms and fills pouches or sacs which greatly stretch the skin, and it is commonly laid heavily on the abdomen and in the omentum. It also loads the interspaces of the connective tissue everywhere, so that the internal organs are likely to be pressed upon, and mechanically embarrassed in the performance of their functions. We

all know the difference between fat encumbering an organ and fatty degeneration of its structure : and we are aware that in the majority of instances, though not universally, the gouty organism is thus encumbered. In truth, very much of the relief which is experienced after an "attack" of the gout is the physical result of the consumption of fat during the fever. It is in great measure due to the presence of this fat under the skin that the gouty come to acquire that peculiar dull and pasty hue which is so noticeable among them ; and to the rapid wasting of this fat they owe the wrinkled and baggy appearance which the overstretched skin is made to assume after the padding that underlaid it has been removed by even a few days' illness.

I am strongly of opinion that the obesity prevalent among the dwellers in cities is, in the majority of instances, gouty, and I think it is a simple chemico-physiological result of imperfect, or incomplete, solution of the fat taken in as food or, it may be, formed in the organism, so that the oil-globules are deposited as quickly as possible at all dependent points and in spaces not otherwise occupied. The fat is not saponified, and this defect is due to the deficiency of the biliary salts, whose purpose it is to saponify them and thus to hold them in solution for the heat-producing and nutritive processes of life and health in the organism. We know by direct experiment, as in the administration or even the inunction of cod-liver oil in excessive quantities, that it is possible so to saturate the blood with oil-globules that fat may be deposited extensively while, all the same, the organism stands in

need of the hydro-carbon, or carbo-hydrate, it is unable to utilize. Thus, the liver of the Strassburg goose is, as we know, crowded with fat because the liver function is suspended; although it is because the liver function is suspended the liver comes to be loaded with fat. A vicious circle! It is, therefore, not difficult to perceive how, if, as I have ventured to suggest, the liver is the organ primarily, or very early, at fault in gout, and its defects are shown by failure in production of the biliary salts, the subject of such a disorder will not unnaturally exhibit a tendency to the accumulation of fat of the grossest or coarsest kind, crudely deposited and ready at any moment to be broken up and removed with surprising rapidity.

The treatment for gouty obesity, and, if I am right in my conjecture, for the majority of cases of clumsy loading of the organism with fat, should consist in supplying, and promoting the formation of, the biliary salts; for which purpose I have already strongly recommended the administration of *taurocholate of soda*. I know no other method of treatment for the undue accumulation of fat which is equally satisfactory from a scientific point of view, and in practice so successful in a fairly large proportion of instances, though not, of course, in all.

GOUTY DYSPEPSIA.

There is a distinction to be drawn between the dyspepsia attendant upon attacks of gout or in many instances preceding them, and what we may understand by "gouty dyspepsia." I do not think this particular form of difficult digestion is "acid," or "weak" in the

sense of consisting in an inability to digest the food taken into the stomach, or in its too rapid *digestion* with acetous acid fermentation, which I take to be the pathology of acid dyspepsia; or that it depends upon a deficiency of pepsine. It seems to me that the mouth and stomach processes of digestion, so far as these are chemical in their nature, are very fairly carried out by the average gouty dyspeptic. Nor does he commonly suffer for taking food; on the contrary, it seems to do him good, for some time at least; but three or four hours after he has luncheoned or dined, or even breakfasted, not too heartily, he is tortured by an intolerable distension of the stomach, which not unfrequently so dilates that organ as to render it tympanitic on percussion, and to thrust the heart up, producing a feeling of distress, or causing severe palpitation, and occasionally giving rise to even more alarming symptoms by embarrassing the breathing. I have seen very serious disturbances caused in this way, and in a secondary circuit, symptoms arising which at first sight seemed scarcely explicable. The pain, if there be any, is generally situated a little below the stomach instead of directly over it. I believe it is actually located in the duodenum, this intestine being distended with food, and the pylorus either, as it were, plugged, or so blocked that the stomach is dilated above it.

There is not unfrequently tenderness on pressure over the region of which I speak, and dulness on percussion, although the stomach above is tympanitic. This dulness often disappears quite suddenly, the symptoms quickly subsiding, with or without the escape of flatus from the mouth, and the dyspepsia is at an end. There

are no after-symptoms, and the distress, which is apt to be very great while it lasts, occurs and ends with surprising regularity, some two, three, or four hours after a meal—that is, precisely when, looking to the nature of the food taken, it would seem likely, from what we know of the length of digestion *in the stomach*, that this organ is engaged in pouring its contents into the duodenum. Again we are reminded that if the liver fail to contribute its due secretion to mix with and act upon the ingesta, accumulation of food in the duodenum is precisely what must be expected to occur, and the food arrested in its course will ferment, because the antiseptic action of the bile is wanting.

The study of this form of dyspepsia in patients with an undoubted inheritance of gout has convinced me that it is useless to attempt a cure, or even prolonged relief, by any system of dieting, however carefully devised. Indeed, I have succeeded in conducting not a few of these cases to a successful issue mainly by removing all the interdictions placed on their food and habit of feeding by previous advisers, and simply insisting that they shall take whatever they fancy, provided only that their meals shall consist of sufficiently stimulating materials to rouse a torpid digestive system, and that they shall be taken deliberately and with some amount of alcoholic stimulant, which I believe to be absolutely indispensable to the healthy performance of the digestive and assimilative functions in the gouty. For the treatment by drugs I rely on the taurocholate of soda either alone or supplemented by one of the stomachic tonics formulated in Part II. Benefit is

also, in *some* cases at least, to be derived from percussion over the seat of pain and tenderness below the epigastrium. However it may be caused, the essential default of the stomach and the upper intestine is certainly one of muscular inactivity—probably due to a lowering of the reflex excitability as well as of the tonicity.

GOUTY COSTIVENESS OR CONSTIPATION AND DIARRHŒA.

These troubles of the gouty habit require to be considered together, because they are really alternative results of the same error of function. The deficiency of biliary salts in the bile prevents absorption of the food; leaving the ingesta in the intestines until they irritate the mucous membrane and set up a mucous catarrh, or causing them to pass through the alimentary canal in a jerky, unnatural manner which, with pain—borborygmi and tenesmus—simulates diarrhœa, or to form scybalæ, which are difficult to void.

There is the same difference between costiveness and constipation as between suppression and retention of urine. In the former the excretions are scanty; in the latter the contents of the intestines are not so much abnormal in quantity or character as unduly retained. Gouty patients generally suffer from one or both of these evils; and they are alternately troubled with constipation or diarrhœa or such frequent evacuation as produces the impression that too much is passed. There is usually in these cases a good deal of distension with flatus, showing that either absorption of the intestinal gases is not normally active or that they

are generated too rapidly. The antiseptic property of the bile is much impaired, and the food decomposes readily. Moreover, there is a disturbance of balance between the assimilative and disassimilative processes; matters which ought to be discharged being retained and the supply of material available for nutrition being deficient. The skin assumes a dull and dirty complexion, the vessels of the conjunctivæ are seen to be loaded with dark-coloured blood, and, without being jaundiced, the general colour of the surface is indicative of—to use a popular but not, in this instance, inaccurate phrase—an “inactive liver.” One of the most characteristic results of this state of matters is that form of mental depression which was originally named, from the colour of the stools that commonly accompany it, *melancholia*—(μελαγχολία).

The confusion which often exists in the minds of patients with regard to the precise nature of the disturbance with which they are troubled—to wit, whether it be constipation or diarrhœa—and the mistakes into which they are led in describing their experiences, give the practitioner much trouble, and often mislead him in treatment. It not uncommonly happens that the actual disorder with which we have to contend is costiveness, there being less than the normal amount of excretory matters voided in twenty-four hours, whereas, from the state of irritation in which the intestines are kept, the quantity of flatus passed, and the frequency and urgency of the patient's desire to evacuate the contents of the bowel (tenesmus), he is led to represent himself as suffering from, and in point of fact is treated for, diarrhœa.

We have already spoken of the accumulation of

flatus in the small intestines and in the stomach in these cases when noticing the dyspepsia of the gouty. The location of the flatus may be inferred from the borborygmi, and also from the fact that it is especially prone to be troublesome at night. The recumbent posture to some extent explains this characteristic, but to that purely physical cause must be added the fact that, the blood-current being slower when the patient is lying down, the absorption of the gas in the intestines is less rapid than usual. To the same cause—that is, the accumulation of gas in the stomach and intestines—must be ascribed the palpitation common at night in gouty cases, together with that exaggeration of the subjective sensations produced by the heart's action which inevitably results from the distension of the stomach; the cardiac contractions being audible, and otherwise perceptible, with augmented distinctness and apparent force, because the heart is lying upon, or is compressed by, the distended stomach, which is like an inflated bladder. The liver in health secretes, as we know, a considerable quantity of bile daily, not less than three or four pints. If this be not so constituted as to be re-absorbed in bulk, as normally happens, and if it also fail to promote the due absorption of the food, there may occur what is really bilious diarrhœa, with this peculiarity, as compared with a diarrhœa of natural bile, that, the bile in gout not having the power of preserving the remains of the food, and the contents of the intestines generally, from decomposition, the matters voided will not look or smell "bilious," although there is an undue quantity of bile mixed with them.

Occasionally, attacks of diarrhœa occur in gout

which resemble the intestinal phenomena of "gastric crises," or the disturbance following a debauch. In the former case there may be simply an outpouring of serum from the blood followed by relief of the turgid vessels of the intestines generally; while in the latter case there may be evacuations of undigested food, some recent, some old and partially decomposed or in process of fermentation, or acid and acrid but deficient in bile. Occasional outbursts of "diarrhœa" with these characteristics must necessarily occur in the course of a habit of constipation, which is partly due to the fact that the liver *excretion* does not normally maintain the peristaltic action of the intestines, and so there is retention; and partly to a deficiency of the intestinal excretion, the concomitant, and to some extent the result, of the impairment of absorption caused by the imperfect character of the liver *secretion*.

In the treatment of these intestinal troubles in gout it is impossible to do any real and lasting service unless we can act permanently on the liver. The indications may be interpreted on general principles, and a selection made from the formulæ which will be found in Part II, for their relief, but beyond a temporary amelioration of the symptoms little can be achieved. Meanwhile, by acting directly upon the liver and supplying the deposit in its secretion with the taurocholate of soda, much more may be accomplished.

GOUTY HEADACHE AND NEURALGIA.

The characteristic headache of gout is generally frontal, but it extends lower and deeper than an ordinary frontal headache, and includes a specially distressing sensation of weight and pain in the orbits, which "seem to press the eyes down." How, precisely, this peculiar sensation is produced is not evident, but there can be no doubt, I think, from what happens elsewhere in gout, that the turgescence of the vessels generally, and the slowness of the blood-current, especially in the veins, are active causes of the distress, which is the greater because the boundaries of the part affected are unyielding. Something, however, is probably due to congestion of the intra-globular vessels, and perhaps to catarrhal effusion into the cavities of the frontal and supra-orbital sinuses; to which must be added the neuralgic state set up by congestion of the minute vessels of the nerve-sheaths.

We are aware that the supra-orbital branch of the superior division of the fifth nerve is especially prone to neuralgic affections, whether on account of its liability to constriction or compression, or to the fact that it is nearer the surface than most other short trunks, and more exposed to external influences. There is, moreover, to be remembered that the frontal branch of the ophthalmic division of the fifth lies in the orbit between the elevator of the upper eyelid and the rigid roof of that cavity, and if the eye becomes turgid it must be compressed, which may account for the sensation of pain and heaviness commonly experienced not only in the eye but throughout the adjacent

region. A peculiar form of circum-orbital neuralgic form is familiar in gout, though not, perhaps, peculiar to it. Females are generally the sufferers.

Gouty neuralgia is a very formidable malady, and it is apparently greatly on the increase. The practitioner is frequently called upon to treat this affection, and it is one of the most intractable, at the same time exigent, with which he has to cope. The pain of neuralgia is always agonizing and wearing in the extreme, and the gouty form of this malady too often baffles every endeavour for its relief. I believe that it is in all cases, when distinctly gouty, essentially traumatic, if I may so call it—that is to say, the pain is caused by mechanical irritation or pressure somewhere in the course of the nerve affected or in that of some branch with which it is in connection. Deposits or indurations either agitate or compress the nerve or its sheath. If the precise seat of the irritation can be discovered, the shortest plan is to treat the case surgically and eliminate the cause. Occasionally this can be done. I have seen cases in which a minute chalk-stone has manifestly been the irritant, and the indication for its removal was as distinct as that for the extraction of a stump or decayed tooth. Generally, however, the irritation is caused by scattered deposits or thickenings in the sheath of the nerve, and prompt relief is out of the question. Cases are also common in which the neuralgia is located in the trunk of a nerve deeply placed, as the sciatic, and it changes from branch to branch, so that, if local measures avail for the relief of pain in one region, it is only transferred to another. It is not necessary to think

of metastasis in this connection, for the branches affected are offsets of the same trunk.

Peripheral irritations may also arise from central, or approximately central, disturbances, and, when this happens, local measures are of little, if any, value. The best remedies in these cases are—for pain located in the branches of the middle and inferior divisions of the fifth, but *not* of the superior division, gelseminum; for neuralgia of surface nerves in other regions, actæa racemosa (cimicifuga); for neuralgia of deeper nerves, the tannate of cannabin. Formulæ embodying these and other drugs which it may be worth while to try are given in Part II. As regards local treatment, the simplest, I think, is generally the best in gouty neuralgia as in other varieties of the disease. Affusions of very hot and *very* cold water alternately may be useful in some cases, but the douches employed should be small, and made to strike as directly and exclusively as possible on the “seat of pain.” I do not think local applications which in other forms of neuralgia sometimes give relief, such as aconite, are appropriate in the gouty form, although in some instances they may be successful, and, in default of help from other means, may be tried. I should not, however, be disposed to continue their exhibition long in any case lest local inflammation might be induced and the general state aggravated instead of being relieved. As regards the discrimination of gouty neuralgia from neuralgia arising from other causes, I do not think the recognition can be certainly made. The nature of the affection, or, rather, its cause, can at best only be inferred from other evidences of the existence of the gouty

habit and state. Inferences from the nature of the pain and the time and manner of its occurrence cannot be trusted. The most significant characteristic of gouty neuralgia is the subsidence of the paroxysm either with, or immediately after, a copious discharge of urates alone or with phosphates; both of which, it should be remembered, are usually deficient in the urine of gouty patients during attacks of the disease. Such a discharge I have found to be of tolerably constant occurrence at the end of a paroxysm of gouty neuralgia; but large deposits of phosphates are so common immediately after all severe attacks of pain or nerve-worry that it is not pathognomonic.

GOUTY BRONCHITIS, BRONCHIAL CATARRH, AND ASTHMA.

It is a curious but, at length, recognized fact that undeveloped or irregular gout is apt to take the form of a bronchial affection with discharge of uric acid from the mucous surface of the tubes and, of course, incidentally, with spasm of the muscular coats of the bronchi caused by irritation. This is especially likely to occur in those generations of gouty families in which the more regular forms of the disease are not developed; but it may also occur in some members of the atavic generation side by side with others who have gout in the ordinary way; or bronchitis, bronchial catarrh, or asthma may harass the lives of decidedly gouty subjects during the intervals between regular attacks or paroxysms. This last-mentioned variety of the affection is not a rare one. There is very seldom any

great difficulty in diagnosing gout in these cases. The expectoration not unfrequently contains crystals of uric acid, and relief of the bronchial symptoms is obtained when either an attack of gout in the extremities is developed, or when a copious excretion of urates takes place in the urine.

There is not much to be said as to the clinical aspects of gout under these forms. They do not present any marked peculiarity beyond the disproportion which exists between the apparent urgency of the lung trouble and its real gravity. There is commonly so much excretion, and the difficulty of expectoration is sometimes so great, with a cough of such violence and obstinacy, that the condition of the patient appears to be alarming; but with startling rapidity the symptoms will not unfrequently subside, and altogether disappear in a few hours, if either an attack of regular gout or a copious discharge of urates in the urine occur or can be induced. After many successive catarrhs there may doubtless be chronic weakness and irritability of the tubes; but very rarely indeed does any other form of bronchial trouble supervene, and, despite the severity of the lung symptoms while they last, there is scarcely ever any structural lesion, rarely even bronchiectasis. The most troublesome cases are those in which the chest affection *is* the gout, so far as the individual is concerned, no other form of the disease being present in the case. It is mainly by the family history, in such an instance, that the nature of the bronchial trouble can be recognized. Gouty asthma more commonly alternates with other forms of gout than occurs alone. It is rather a stage of the bronchial

catarrh than an isolated form of the malady. Nevertheless, there are cases in which asthma pure and simple, with all the familiar characteristics of that affection, is proved to be gouty, the evidence being, first, that there is a distinctly marked inheritance of gout in the case, and, second, that relief occurs, and occurs only, when a considerable quantity of urates is voided in the urine.

The treatment of these gouty bronchial affections must, to be quickly successful, consist in the reduction of the local irritation and in discouragement of the excretory process, while a flow of urates through the kidney is promoted. It is useless to treat cases of this class with expectorants. Anything that encourages the bronchial secretion aggravates instead of relieving the lung trouble, because Nature is using that channel for the evacuation of the irritant that loads the blood. The best and, in my experience, only expedient plan is to give diuretics in place of expectorants or diaphoretics, and to check the cough by sedatives—in short, a method of treatment the reverse of that which would be adopted in any case of ordinary non-gouty bronchitis or catarrh. The asthma is most promptly relieved by quickly acting on the kidneys, and the use of steam with or without medicated vapours to obviate the spasm. I believe that when the gouty lung-trouble takes the form of asthma, instead of bronchitis or bronchial catarrh with a flow of mucus, it is because there exists some special irritability of the bronchial muscular fibres, or, rather, of the nerves supplying them, and the individual would probably be harassed by cough or asthma even if he were not gouty.

Doubtless, in certain cases in which the asthma is developed after repeated attacks of bronchitis or asthma, it is induced in the usual way by inflammation of the fibrous structures; but such cases are rare except among the aged, and then it is impossible, except from the history of the affection, to distinguish it from ordinary senile catarrh with spasmodic complications. In Part II. I have set out some formulæ which the practitioner may find it useful to employ.

GOUTY SLEEPLESSNESS.

Sleeplessness, or, rather, wakefulness, is a very common trouble in gout, and not unfrequently constitutes the special form in which an irregular gout declares itself. In some cases there is, without any other symptom of ill-health except, perhaps, slight dyspepsia, an inability to "go to sleep," the mind becoming particularly active and the senses more than commonly acute as soon as the head is laid on the pillow; and sleep is not obtained until mind and body are thoroughly worn out by worrying wakefulness, so that when morning comes there is even greater weariness than was experienced at night. In other cases the sufferer from gouty insomnia "drops off to sleep," but either quickly regains his consciousness with a start and afterwards lies broad awake, sleep having wholly departed from him, or he wakes regularly night after night at a certain hour, often at a time determined by some habit formed in early life, and no more rest can be obtained until he is thoroughly exhausted with watchfulness. Only those who have

experienced a long-continued sleeplessness of one or the other of these forms can have any notion of the suffering they entail, and the way in which they weaken the intellectual powers and irritate and deprave the faculties of the sensorium. It is of the highest moment that the practitioner should be able to grapple with this mystery and misery of sleeplessness as it occurs in cases of irregular gout.

The special cause of gouty sleeplessness or wakefulness is, I believe, want of tone in the muscular coats of the arteries. They either do not contract, or do not maintain their contraction, when the heart slows its rhythmical movements on the body being placed in a recumbent posture for sleep, so effectually that the supply of blood to the cerebrum and the nervous centres generally shall be diminished. This defect of tonicity, or atony, may either be part of the general want of energy, manifesting itself specially through the vaso-motor centre, or it may be due to rigidity at some point in the course of a principal artery. There are other incidental disturbances which occur in cases of undeveloped or suppressed gout which probably arise from the same cause; for example, attacks of semi-consciousness not unlike *petit mal*, and even more pronounced forms of epilepsy. I have cases of the class under observation in which the presumption is strongly in favour of such a pathology. Meanwhile, whether or not the hypothesis of causation which I have submitted be the true one, it is manifestly necessary that each case should be studied with a view to make out the precise form of insomnia under which the patient is labouring. The recourse to soporifics—

always, as it seems to me, a clumsy and unscientific expedient for the relief of wakefulness—is practically out of the question in gouty sleeplessness. If any real good is to be done, the practitioner must take the pains to ascertain definitely the cause of the unrest, and to place the subject of the trouble in a condition to favour sleep. This done, he may confidently count on the success of general measures of treatment for the great underlying cause—namely, the gout; which being relieved, its disastrous effects will cease also. With a view to facilitate the investigation of the nature and exciting causes of the sleeplessness, I beg the reader's attention for the following general remarks which appeared in a medical journal some five years ago,* and which I am glad of the opportunity to reproduce. While originally directed to the clinical study of insomnia from whatever cause arising, they have a special application to the sleeplessness occurring in connection with irregular or atonic gout.

Sleeplessness — other than that occurring as a symptom, or in the course, of *acute* disease—is one of the commonest troubles the medical practitioner is called upon to treat; and it is not the least embarrassing. It is protean in its forms, and so complex and obscure are its indications that the treatment it receives generally consists in a recourse to the expedient of stupefying the brain by opiates, chloral, or bromide of potassium, thereby annulling the consciousness and mimicking natural sleep by an artificially induced state, which may in some cases end in sleep, but is not itself sleep

* The *Lancet*, August 28, 1880.

in any physiological sense, being a drug-created stupor. Thus is the difficult task of precise diagnosis avoided; while we compound for the discharge of the duty of special and direct treatment of insomnia by overpowering the self-consciousness. One of the first steps towards establishing a more satisfactory condition of matters, and introducing a better system of treatment for this trouble, must take the form of an endeavour to obtain a deeper insight into the causes and forms of sleeplessness. I desire to bring under the notice of the profession a proposal for the classification of these causes or forms in, what seems to be, a natural order.

It may now, I think, be fairly assumed that neither Fleming, Cappie, Durham, Hammond, Sommer (arguing from the results of experiments made by Pettenkofer and Voit), nor any other of the many investigators who have tried to solve the enigma of sleep on physiological principles, has entirely succeeded. Each of these inquirers has contributed something to the sum of knowledge we possess about sleep; but, after all, the conclusion at which Vulpian arrived, simultaneously with other observers in this country, myself among the number, is probably the true one—namely, that the modifications of blood supply and pressure, which have in turn been supposed to be the causes of sleep or wakefulness respectively, are their concomitants or consequences. In short, the changes shown to take place in the rate of the circulation, and the size of the vessels of the brain, during sleep are the results, not the causes, of that state. Even in relation to the so-called “sleep” produced—or induced—by drugs, it seems probable that

Vulpian is right when he sums up the inferences to be drawn from his very elaborate and careful experiments as follows:—"Le sommeil chloralique n'est donc pas dû, plus que celui qui est provoqué par l'éther, le chloroforme ou l'opium, à une anémie ainsi produite dans le cerveau. Nous pouvons donc dire que l'action hypnotique des diverses substances, que nous avons étudiées, sous ce rapport, s'exerce sans que les effets qu'elle produit puissent être rattachés à des modifications vasculaires des centres nerveux. Ces substances n'agissent pas, en effet, sur ces centres, par l'intermédiaire des vaso-moteurs, comme on l'a admis sans la moindre preuve directe; c'est sur les éléments anatomiques mêmes des centres nerveux que porte leur influence. Ce sont ces éléments qui sont directement modifiés, probablement parce que les agents en question y pénètrent et y produisent une altération histo-chimique." In any case we are, I think, driven back, from our speculations in physiology, upon the study of the mental and sensory phenomena, in the search for a deeper and more accurate knowledge of sleep as a rhythmical function of life. Until new light is thrown on the question of the actual and intimate cause and nature of sleep we may most usefully direct our attention to the subjective experiences and objective characteristics of the act or state of sleeping; and it will help our inquiry, as well as facilitate the practical task of discovering remedies for the defects and aberrations of sleep, to classify the proximate causes, or forms, of nocturnal wakefulness.

There are two groups of experiences in insomnia.

I. The psychical, or mental, including such sensa-

OUTLINE OF A PLAN FOR THE STUDY OF MENTAL

"Le sommeil général es

GROUP I. RELATING TO THE CONSCIOUSNESS: THE DIS

Faculties causing or concerned in the Sleeplessness.	Sleeplessness apparently due to the Conditions expressed by—				
	"Not being sleepy, or unable to sleep."		"Being too much engrossed		
	Symptoms.	Treatment.	Symptoms.	Treat	
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">"Systatica, irritation or inertness of the mind extending to the muscles or external senses; or of the muscles or external senses extending to the mind."—MASON GOOD.</p>	Thought and imagination.	Thought acute; imagination active when external objects are excluded.	Interdict dozing by day. Discharge the energy of the cerebral centres by special work, such as reading aloud before going to bed.	Thought or fancy weary, but unable to get rid of some special subject which has taken hold of the mind.‡	Encourag on the topic by thus let discharge fore tryin
	Sensation (general and inclusive).	The senses kept on the alert by the Will; watchfulness, mental expectancy of general sense-impressions.*	Change of the surroundings. Give the mind a sense of security by any simple arrangement. A warm bath before sleep.	Expectancy or imagination of a special set of sensory impressions haunts the consciousness.	The sp tion eng be dealt v tail as b charge t energy b
	Sight (mental or voluntary).	Watching, with intolerance of the dark. Real objects being invisible, images of thought are too vivid.	Apply a bandage over the eyes before the light is extinguished. The Will thus inhibits both mental and physical sight.	Thought so engaged with particular pictures of memory or fancy that it cannot put them away.	Careful inspection of highl pictures c will displ turbing thought.
	Hearing (mental or intentional).	Listening, with intolerance of special noises or sounds, and impatience of complete silence.	Stop the ears with cotton-wool before trying to sleep. This inhibits the act of hearing, and gives rest.	Expectancy or imagination of special sounds, as a cry or noise which has before disturbed or affrighted.	The ir of sounds help to attention. or the ti clock.
	Touch (in its direct relation to mental impressions).	Irritation caused by weight or texture of bedclothes. One form is the sense of "falling" when going to sleep on the back.†	Warm bath, followed by cold douche or spray, and lying flat on the back on a couch before getting into bed.	Special expectancy in relation to touch. Common in children, and the aged in whom mental dispositions of childhood revive.	To brea ized expe "feelings the surrou yield for the dem: conscious
	Taste (mental or voluntary).	Seldom general, but sometimes so. And then leading to an untimely craving for food.	The use of a flavoured lozenge will relieve and prevent the craving for food.	Special tastes may be heightened at night, or a taste ordinarily present be only then recognized.	The use giving t desired, c that whi tasteful.
	Smell (mental or voluntary).	An acute sense of smell often causes sleeplessness. It may be real or imaginary.	Holding nose over steam before going to bed; as a palliative use scent or snuff.	A highly sensitive condition in respect to a particular odour, real or imaginary.	Use see ing the covering sant odo imaginari
	Muscular-consciousness.	Fidgeting or twitching. When this occurs in muscles of hip-joint, shoulder or elbow, it causes dream of jumping or falling.	Care should be taken to avoid supporting the body on a particular joint or limb. Warm bath relaxes muscles; cold braces.	The Will set on grasping a particular object or maintaining a particular position; sleep impossible unless impulse be satisfied.	Intenti donment inhibits t lar action requiring action wi act it.
Visceral-consciousness.	The attention may be morbidly directed to any one of the viscera or their functions.	Satisfaction of normal needs and impressions before lying down. Avoid late meals.	Special sensations in the viscera, or feelings engendered by them, may prevent sleep.	The ca feelings investiga treated di vert after	

* "Agrypnia Chronica: Habitual wakefulness; mind tranquil; attention alive to surround

† A form of anaphia which impresses the mind with a feeling that the body has lost

‡ "Agrypnia Entonica: Sleep retarded by an inordinate excitation

Sleeplessness apparently due to the States of—

"Irritability."		"Inability."	
Symptoms.	Treatment.	Symptoms.	Treatment.
irritable state set by disorderly or prurient thought. When no longer restrained by the soundings excitement ceases.	Good and sufficient brain work by day; quiet, sober, and healthy thought in the evening.	A sort of mental nightmare. "Inability" to control thought. The imagination seems to overpower the will.	The performance of an intellectual task which can be achieved almost automatically— <i>e.g.</i> , recalling verses from a dramatic poem.
Mentally induced hyperæsthesia. When the attention is diverted, this state of irritability generally ceases.	Measures to divert the attention. The use of tepid bath or spray, with cold sponging and brisk rubbing.	Mental, or mentally induced, anæsthesia occurs at night when the influence of the surroundings is withdrawn.	Sponging with <i>very hot</i> water (not a bath) immediately before going to bed.
Irritability of mental faculties, which renders the patient liable to speculations of fancy, with increase of light.	Gazing on objects moving slowly and monotonously just before trying to sleep.	Inability to see <i>mentally</i> may be occasioned by inability to see <i>physically</i> , or it may be the effect of a mental weakness.	Sleep in a well-lighted room, surrounded by <i>near</i> objects. Reading or thinking of subjects easily <i>pictured</i> by thought.
Irritability of mental faculties, with physical hearing, with especially sensitive intolerance of sounds.	Cotton-wool. Avoid making resonant shell of ear in placing it on pillow. Fatigue the hearing before sleep.	Inability to hear, real or imaginary, may be a cause of sleeplessness.	Avoid sleeping on a partially deaf ear. A watch under the pillow will often relieve, or the loud ticking of a clock.
Irritability, with hyperæsthesia of the skin, common in certain cases of mental disorder, or established by treatment.	Warm bath, followed by cold sponging, and voluntary tolerance of the symptoms, will generally restore quiescence.	Anæsthesia of the surface mentally induced, often hysterical, occurring at night, because the mind is thrown in on itself.	The use of a bath and rubbing with towels of rough texture.
Irritability of this kind. Often caused by decayed teeth or ulcers on palate.	This may generally be relieved by cleansing the mouth and teeth with hot and then with cold alum-water.	Inability to taste may occur in persons who have smoked excessively, or in the aged.	The use of a strong lozenge: <i>e.g.</i> , capsicum or camphor. Special treatment for the local affection.
Irritability of the sense of smell, continuous or recurring, may be specific.	The treatment must be specific and directed to the cause. For general relief use snuff.	Inability to smell, real or imaginary, is an occasional cause of sleeplessness.	Local applications of a strong, stimulating character—snuff or douche.
Highly excitable state of the muscular system, choreic or hysterical, may arise from treatment of muscular work by day.	Special treatment or fatigue of the muscular system by particular forms of exercise.	A consciousness like that accompanying paralysis, sometimes due to the weight of clothing. Nightmare.	Remove all bonds and burdens, and place body and limbs in a half-flexed and free position before sleeping.
Irritability of the vis-à-vis-consciousness common in hyper-sensitive, hysterical persons.	Treatment must be specially adapted to remedy or relieve the particular state or to remove the cause.	A feeling of inability to discharge special functions may cause sleeplessness.	Special treatment for the cause. In cases of hysterical or mentally disturbed states, a late meal relieves.

very common to advanced age; found also occasionally in excessive fatigue, &c."—MASON GOOD.
 and, I believe, by partial stagnation of blood in the posterior columns of the spinal cord.
 particular object; listlessness to surrounding objects."—MASON GOOD.

tions as may arise from the mind making intentional or conscious use of the sense-organs. 2. The automatic, or sensory, comprising those intellectual acts or processes which are performed by habit, repetition, or what is called instinct, together with all the sensations which are involuntary and uncontrolled—or uncontrollable—by the will. To one or the other of these groups every cause or form of sleeplessness, not essentially morbid, may be referred. The classification set out on pages 114, 115, a simple tabulation of clinical notes, will make my meaning evident. I am compelled by want of space to give only one of the tables comprehended in my scheme, and in the reproduction of that I have been obliged to omit all but a meagre sentence under each heading to mark its purport. The reader will, however—if he approve the principle—have no difficulty in recalling the results of his own experience as to the symptoms and methods of treatment here indicated in rough outline. It is simply on the adoption of a precise method of classification for clinical purposes I am anxious to insist.

Group I., as embodied in the Table, includes the causes or forms falling within the domain of the Consciousness, and probably located in the supreme cerebral centres, psychical in their character, and to some extent, at least at the outset, under the control of the will. They may be recognized as standing in close relation to some one or other of the nine faculties or departments of consciousness—viz., thought, sensation (inclusive of the senses generally acting in concert), sight, taste, smell, hearing, touch, conscious muscular movement, and visceral-consciousness (that is to say,

the consciousness of what is going on in our viscera, or "feelings" and impulses taking their rise in or from the viscera). In respect to each of these forms of mental consciousness there are two varieties of Condition and two of State, *condition* being transitory, *state* more permanent: the consciousness may be accidentally thrown into a particular Condition; or it may, by persistence of an exciting cause or weakness, fall into a particular State. Thus there may be on a special occasion the Condition of "not being sleepy, or unable to sleep," and there may grow out of this condition, if often repeated, the States of "irritability" and "inability" to sleep. Under the heading "Not being sleepy, or unable to sleep," in relation to *Thought* there may be simple wakefulness, with a disposition to think on any subject that suggests itself indifferently; or, in the absence of any special topic of formal consideration, imagination may disport itself wildly. In relation to *sensation* as a whole, there may be a condition of watchfulness or general mental expectancy, the mind being, so to say, on the alert, keeping the senses awake; or in relation to the senses severally there may be troubles—*e.g.*, of *sight*, mental watching, with intolerance of the dark, and expectancy or fear; of *hearing*, mental listening, awe-stricken or hopeful, with impatience of silence and wakeful imaginings of sound; or, disturbances in connection with the sensations of *taste*, of *smell*, of *touch*. Longings or impulses for *muscular movement*, with a chafing sense of the restraint imposed by quiescence, may cause sleeplessness; or there may be mental impressions arising, or imagined, in connection with the visceral organs, which I pro-

pose to class as forms of *visceral-consciousness*. Again, the heading "Being too much engrossed to sleep" will include *thought*, busy or exhausted with a special task or subject of which it cannot rid itself; the *sensations* generally engrossed with a supposed duty of watchfulness, or severally engaged with and unable to leave a particular subject of mental *sight, hearing, taste, smell, or touch*. The *motor* faculty may be too busy with a special act to sleep, or the *visceral-consciousness* may dwell wakefully on a particular organic function. In like manner under the general heading "State," there may be continuous or recurring "Irritability" of any one or more of the several faculties; of the kind which occurs when, by imagining, a "nervous" person so works on his mental sense of sight or hearing, that every wave of light or sound disturbs him; or, again, there may be conscious "Inability," with a distressing sense of powerlessness to perform some function, as when the knowledge that *hearing* is difficult so distracts or distresses the mind that sleep is impossible, the Consciousness worrying itself with the analysis of every imperfectly recognized sound, and thus creating a special cause or form of mental sleeplessness.

Group II. I have been unable to tabulate, but in outline it resembles that presented, and includes the common forms of sleeplessness related to the Sub-consciousness, being organized *habits*, probably located in the centres, or in molecular combinations formed by the repetition of mental processes, and only partially under the control of the will, having passed into the class of "automatic" activities, over which the lower or sub-consciousness holds sway, although—to revive a good

old term—they may be *consensual*. The classification of this group is identical in its outlines with that suggested for Group I. Under the headings, “Not being sleepy, or unable to sleep,” and “Too much engrossed to sleep,” we may have the automatic faculty of *thought* exercising by the force of habit individualized functions, and carrying out special processes of reasoning on every topic or subject that occurs to the mind. A clerk will reckon and calculate, a lawyer argue, a divine preach, a writer compose, in obedience to the law of habit, sleep being impossible. It is this form of disturbance which makes persons feel that they are “too tired to sleep,” the truth being that the controlling faculty of Will is too weary to inhibit the automatic faculty, and they cannot, therefore, go to sleep in a natural way, and are sleepless. The *senses* generally may be actively watchful and wakeful, also in obedience to the law of habit, as often happens after a lengthened period of watching by a sick bed, or the formation of a strong habit of keeping on the alert. Any one of the senses may be individually wakeful from custom. The sensory and muscular systems may be sleepless. Cases illustrative of this class of disturbances are of frequent occurrence; *e.g.*, after a long voyage nervous or sensitive persons cannot sleep without the noise of the wind and waves, and that automatic balancing of the body which is induced by sleeping in a berth, or even in a swinging cot or hammock. Habits of function in relation to the *viscera* are also very common, and may be the causes of sleeplessness. Thus the bladder or intestine may form a habit of discharging its contents at particular

times; and, partly from habit, and in part from the vascular and nerve changes incident to "going to sleep" or "awakening," there may be experiences in connection with the organs of special function which disturb and greatly distress, especially if they are not understood. A not uncommon trouble of this class which occasions much distress and anxiety, when its nature and cause are unrecognized, is priapism occurring in the early morning. This, I believe, is generally the result of irritation of the spinal cord in the process of its awaking; although sometimes it may be the effect of reflex action excited by urine in the bladder. Under all these varieties of condition, the faculty in the habit of working at night is wakeful, and, being unable to perform its accustomed labour because the organs with which it is busying itself are asleep, disturbs the whole body by fruitless and fidgety endeavours. States of Irritability and Inability affecting the automatic sub-consciousness are likewise common causes of sleeplessness, as when a habit of sleeping in the dark renders the least streak of light intolerable.

The key-note of the classification proposed may be found in Bichat's aphorism, which I have set at the head of the table, "*Le sommeil général est l'ensemble des sommeils particuliers.*" The several sleeps composing general sleep do not commonly occur simultaneously or last during equal periods. The order of their occurrence in falling asleep seems to be—1, muscular consciousness; 2, sight; 3, hearing; 4, smell; 5, taste; 6, thought; 7, touch. This is a broad statement, and will be found only approximately

accurate; the order varying much with the individual organism and habit. The order of awakening is generally the reverse of this. The rest enjoyed by each system contributes its share to the grand result, and the relative proportions of the several sleeps compounded determine the character of the phenomenon as a whole. It follows that the converse is true with regard to the nature and causes of sleeplessness. The general character of the "sleeplessness" from which a patient suffers, and the plan of treatment most likely to be successful in his cure, can best be ascertained by recognizing the particular *cause* or *form* of the wakefulness; and this may be most readily made out by noting the prominent symptoms, and determining the class and group of the natural classification to which they belong. If any one should contend that the phenomena I have noted and classified are not causes but simply symptoms of sleeplessness, he still may regard them as *forms* of the trouble, and it will be open to him to accept, at least in principle, the grouping suggested.

The differential diagnosis of the two groups of causes or forms of this trouble is of the highest importance, because the principles and methods of treatment are not identical for the corresponding conditions and states, or even for what appear to be precisely similar symptoms or indications. Thus, for example, the characteristic feature of the phenomena in Group I. is the element of Self-consciousness which declares itself, or may be detected, as a conspicuous part of each experience. The Will has a limited, but *only* a limited, power over the functional or organized habits

of the sense organs, over the muscular and visceral systems, and even over those tracts or departments of the brain which are concerned in sub-conscious cerebration. Will can sometimes inhibit particular actions or interrupt the discharge of special energies—or energy striving to act in specific directions—which habit has liberated. It can, so to say, block the line of least resistance. The Will is not, however, directly or actively concerned in the causes or forms of sleeplessness which would be classed in Group II., unless it specially interposes, because every process of thought or action which has been organized by repetition and become a *habit*, has passed out of the domain of the supreme faculty of the Consciousness into the series of automatic activities controlled by the Sub-consciousness: whereas the Will *is* directly and actively concerned in the causes or forms of sleeplessness included in Group I. It follows that, while the treatment for the disturbances in Group II. must be indirect, and so aimed as to operate through the senses chiefly, that adopted for the relief of the troubles classed in Group I. must in some way act immediately, or, at least, very directly, upon the Will and Consciousness. Mental diversion will relieve the symptoms of Group I., whereas it is not unlikely to intensify the wakefulness arising from the troubles of Group II., although at a glance these may seem identical in form with the others. The intensifying of automatic actions when the self-conscious attention is diverted is well understood. The restraint of the Will being withdrawn, “impulse” or “instinct” has unqualified control of the organized brain and nerve centres. Another matter not so com-

monly recognized is the fact that if the Will be pressed or even permitted to interfere for the amendment of a troublesome *habit*, it generally increases the trouble by irritating the nerve-centre, or molecular combination which has been formed by repetition for the performance of the particular act or process it is desired to control. The centre not having been constructionally disciplined for control by the Will resents the authority that faculty now tries to exercise over it. Thus, if an expert and practised pianoforte player were to try to make the fingering of each chord a voluntary act, he would be unable to play, and throw himself into a fever of excitement. This is what happens when the essential difference between the two classes of phenomena classed in Groups I. and II. is not perceived, and the voluntary method of cure by "trying," likely to be useful in the one case is misapplied to the other. The discrimination is not always easy, but it is indispensable that it should be made. The history of the case and the known effects of Attention in relation to the seeming cause of the wakefulness will generally enable the practitioner to determine the group to which a particular phenomenon or symptom belongs; but he must make the discrimination for himself, because nothing is more unwise or conducive to failure in these cases than to ask leading questions. The examination should be so conducted as to avoid giving the patient the slightest clue to the nature of the investigation pursued. Even when the cause of sleeplessness has been recognized, it is, except in rare instances, undesirable that the patient should be informed of the precise nature of the disturbance. If the cause belong wholly to the

second group, as being a matter of habit, it is almost always essential that the patient should be kept in ignorance of the trouble from which he suffers, and it *must* be treated through the surroundings or indirectly.

I am not asking medical men to over-estimate, still less am I wishing them to treat, symptoms, but to search for the causes of disease by tracing back to their several sources the divers forms of an affection which may spring from any one of a large number of disturbances. There is no means of getting at a disease, and acquiring an intimate and precise knowledge of its nature, except by studying the formulæ of its manifestations; and there is no safe way of selecting a method of treatment except by observing carefully the indications for treatment which are supplied by these same formulæ. I know well that the bane of modern science is the exaltation of the analytical over the synthetical method of research; but here we are face to face with a symptom too often regarded as a disease. We do not know what it is. It has never been, so to say, picked to pieces, and we have hitherto treated it *en bloc*. Not being able to ascertain what it is keeps a particular patient awake, we exhibit a so-called "soporific," which will stupefy or intoxicate him until he falls into a state of unconsciousness, and in the end, *perhaps*, sleeps! The practice is not, possibly, less scientific, but it is certainly not one whit more so, than to treat pains in the epigastrium with anodynes, without taking the trouble to inquire whether there be any organic disease of the stomach, whether the food taken is digestible, whether it is properly masticated, or

whether the patient is suffering from excess, or, it may be, starvation. We cannot proceed a single step on the way to treat Sleeplessness intelligently until its form, in each particular case submitted to us, is definitely ascertained, and the cause of wakefulness clearly made out.

In Part II. will be found a series of formulæ which experience has shown to be useful in cases of gouty sleeplessness, and which may be employed simultaneously with the measures *to obviate wakefulness* which the investigation above suggested may induce the practitioner to recommend or adopt.

CHAPTER IX

GOUTY AFFECTIONS OF SPECIAL ORGANS.

THERE are two forms of local, or localized, affection of special organs in gout. In the one form the organ is attacked suddenly by what is termed *metastasis*, either the morbid material or the irritation being transferred from one place to some other—in this instance, from a joint in an extremity to an internal organ. In the other form there is more or less specific and gradual disease of the organ affected. The former class of affection occurs in retrocedent gout, the latter in irregular gout. It is incumbent on the practitioner to keep every case of gout so completely under his observation that he may not be taken by surprise if the malady should at any moment change its seat; and that he may be cognizant of the state of every organ so that no local affection may be developed insidiously. It is one of the most striking characteristics of gout that it *does* change the form and place of its morbid energy with almost inconceivable rapidity, and therefore, like a wise general, the practitioner in charge of a case will not omit to maintain the most watchful precautions against surprise.

The pathology of gouty affections of the organs by metastasis is not well ascertained, but for clinical purposes it is well to regard them as akin to the

sudden congestions which occur in typhoid fever, and which are probably produced by sudden paralysis of the muscular coats of the arteries supplying the parts affected; the result of special vaso-motor irritations or inhibitions. We know how in influenza or hay-fever the vessels of the Schneiderian membrane and of the conjunctivæ may be instantaneously congested, and pour out their contents by transudation. The dilatation is as rapidly effected as a blush of the cheek, and physiologically in precisely the same way. It seems likely that this local collapse, as it were, of the tonic power of the arteries occurs in gout with special readiness because the disease is peculiarly depressing; and that, when it occurs, the blood, being loaded with uric acid or sodium urate, rapidly effuses its irritating material. This I believe to be the rationale of a gouty metastasis; and, if I am right, it is easy to understand why the stomach, the heart, the liver, the lungs, or the kidney are likely to be affected—because these organs lie directly around the great central ganglia of the sympathetic system through which the vaso-motor nerves are carried to their destination, and through which the vaso-motor centre in the medulla doubtless acts. It seems to be forgotten by some writers on hyperæmia that only two forms of that affection are possible, one in which the blood is injected into a system of vessels with such force that the tonicity of the muscular coats is overcome, and another in which the vessels of the region are the subjects of a sort of paralysis. There is no such thing as *active* dilatation of the arteries. They either give way or are overcome. The sole muscular function is *contractile*.

In gout the local hyperæmia is either paralytic or inhibitory.

The affections of internal organs which occur in this disease in what may be termed a more legitimate way are, doubtless, specific; there being the usual stages of effusion, with inflammation either as a primary or as a secondary factor in the pathological result; and deposits of the urates in the interspaces of the connective tissue, or the parenchyma, of the organ affected, with mechanical compression and destruction of its elements; or simply crystallization of the urates in the walls of tubes which form the special excretory elements of the organic apparatus. This is what takes place in the kidney and the liver when gout affects those organs directly by regular processes. Now let us briefly note the clinical characteristics of some of the most familiar localizations of gout; not—as we said at the outset—with a view to discuss the pathology of these affections of the several organs, but to obtain such a general notion of each as may suffice to form the basis of an intelligent mode of treatment.

“GOUT IN THE STOMACH.”

The stomach is peculiarly liable to be affected in gout either by metastasis or by direct disease. I have already hinted that the metastatic affection, which, probably, consists in sudden congestion by paralytic dilatation of the arteries supplying it, is frequent because the organ lies close to the centre, as it were, of shock or disturbance by any strong impression produced on the solar plexus. When this occurs, which may be at any moment in gout, but is especially likely to be when

some strong impression either of "chill" or injury is transmitted from the extremity to the centre, the organ becomes instantly affected with atonic hyperæmia, of which the immediate results are acute pain and tenderness, a sense of heavy weight, numbness, or chill, with cramps, irritability, nausea and vomiting, and, perhaps, hæmatemesis. If the congestion be prolonged, there may occur an acute gastric catarrh; but, from the nature of the malady, it will be of low type. The indications cannot be mistaken. Applications of turpentine stupes or hot poultices of mustard and vinegar, to the epigastrium, and the instant administration of cordials and sedatives, *camphor*, or *musk*, and *opium*, internally, are probably the best measures. In Part II. appropriate remedies will be found grouped for selection and other matters of detail will be discussed at greater length.

I am inclined to think that many of the cases of so-called gastrodynia, gastric catarrh, and ulcer, which occur in the female members of gouty families, are forms of irregular gout, and should be treated as such. The diagnostic signs are, first, the history of gout in the family, and, second, the fact that in such cases relief is associated with the appearance of urates in quantity in the urine, while, when the urates are deficient, the gastric symptoms are worse.

GOUTY HEART.

The heart may be suddenly affected in gout as it is in rheumatism; but, instead of "to and fro" friction sounds, or bruits, there are commonly intermissions and sudden failures of the first sound, with faintness and

what used to be called "anxiety at the precordium." I do not think the perils attendant on gouty affections of the heart, though severe while they last, are so prolonged or necessitate nearly so bad a prognosis as those resulting from rheumatic inflammations of this organ. In gout the blood is loaded with an exhausting irritant, but it is an acid or a salt capable of being washed away even if deposited. In rheumatism the blood is loaded with fibrin, which, being deposited, has a strong tendency to become organized. When there are bruits, and friction sounds, in gout, they *do* pass away; whereas in rheumatism they are always likely to be permanent because they imply injury to the organ invaded. The indications are to prevent syncope, and to maintain the activity of the organ, rather than to subdue inflammatory action. Gouty affections of the structure of the heart are rare. When they do occur, they are the consequences of functional disturbance and disorderly excitation making excessive and irritating demands on the mechanism of the circulation at the centre *because there is an abnormal resistance offered at the periphery*. The arterioles are unduly contracted by spasm, or the blood-current is arrested by a block somewhere in the venous system. Gouty heart troubles are generally of slow growth; not acute as those which occur in rheumatism.

GOUTY LIVER.

Gouty congestion of the liver is one of the commonest of occurrences, and, when it takes place, the enlargement of the organ may be very considerable, and the un-

loading of its heavily gorged vessels and proper eliminating apparatus a work of special difficulty. Parenchymatous inflammation may be set up by the irritating material effused, while the urates encrust the corpuscles and tubes. The destructive effects of mechanical compression and irritation may be produced in the liver with great rapidity, and as the liver is not only a depurating organ specially related to the nervous system as the eliminating apparatus for cholesterine, but a secretive gland for the supply of the special biliary salts and other elements which play an all-important part in assimilation, as well as in the disassimilative processes, gouty liver, when advanced, is a very serious matter indeed. Happily, although the liver is congested before, or at the outset of, almost every attack of gout, and frequently in the course of chronic and regular gout, and although it is not easily relieved by treatment, it seems to possess a wonderful power of self-recovery, and, so far as my experience goes, it does better if left to the *vis medicatrix naturæ* than if specially treated, at least in any active way. I often think it is no disadvantage that the extent to which the liver is affected in gout is not—probably because, being capable of considerable distension, it does not commonly become the seat of actual pain—more generally recognized. It is seldom necessary to do more than apply warm flannels sprinkled with turpentine. Stimulating liver medicines I believe to be generally injurious. (See Part II.)

GOUTY KIDNEY, BLADDER, URETHRA, ETC.

Any affection of the apparatus by which urine is excreted must needs be of the gravest importance in gout, because it is almost, if not altogether, upon the efficiency of this particular excretory function the elimination of the materies morbi depends. Moreover, the mode in which gout affects the kidney is in a special sense destructive, seeing that its immediate and progressive result is to block the way of egress for the uric acid and urates, which are the exciting causes of the whole disturbance, and which it is imperatively and urgently necessary to expel.

Keeping strictly to our *clinical* standpoint, we may divide the gouty troubles affecting the kidney and the urinary apparatus generally, into two classes, the one including those of the nature of calculus, in which the apparatus is, as it were, blocked and hampered rather than itself diseased; the other comprising all the forms of gouty disease of the organs of urinary excretion and voidance in which the structures involved are themselves the seats of morbid processes affecting their organic integrity. In the first class may be grouped those neuralgic affections of the kidney which we know to be common among the female members of gouty families, and which often occasion a great deal of needless alarm because they happen—as can scarcely fail to be the case—to be accompanied with a certain amount of albuminuria. What takes place in the nephralgic cases is an irritation of the renal nerves set up by the continual passage of uric acid and urates

through the kidney, by the frequent occurrence of impaction in the tubes, and every now and again by accumulations of gravel in the organ, often culminating in the formation of small calculi in the pelvis of the kidney. When these calculi pass down the ureters there are, of course, characteristic paroxysms of pain and fever. So long as they are retained in the bladder there is local irritation of that organ, with pain or aching in the perineum, frequent impulse to micturate, and perhaps a sharp attack of retention, with incidental pyrexia, if the small stones become impacted in the urethra. Nephralgia, with its train of consequent disturbances, is one of the very commonest of ailments for which practitioners are consulted; and in the great majority of instances the cause is gout, the evidence being that of a history of hereditary disease, and the usual variations in the proportional quantity of urea in the urine, usually alternating with the appearance of "cayenne pepper" deposits, or a copious discharge of urates. The albumen found is frequently dependent on the presence of very small quantities of blood in the urine, the result of mechanical injury done to the organ by the crystals; but it is by no means uncommon to find, apart from this, serum-albumen, which has either not been taken back into the blood—on one hypothesis of albuminuria—or has been allowed to escape—on another hypothesis—owing to the denudation caused by mechanical abrasion of the epithelium lining of the tubes. Epithelial cells are commonly found in the urine, and doubtless some of these come from the tubes of the kidney, though the principal

seats of denudation may be the pelvis and the ureter. Accompanying the dyspepsia of gout in women there is also very often oxalæmia, and when the mistake is made of giving such patients lime-water with milk, their sufferings are aggravated by oxaluria. Although this is the common trouble of female members of gouty families, it may, and very often does, also affect the males of such families, particularly in the intermediate generation. There is cause to fear that many lives are made needlessly miserable, and otherwise promising careers blighted, because the nephralgia, and the albuminuria which occurs either with, or sometimes without it, in result of mechanical irritation or injury to the structure of the kidney, in gout, are not recognized as affections altogether apart from the pain and albuminuria of "small granular kidney." Congestion of the kidney may readily be induced by the irritation set up when crowding of the urinary channels or actual impaction take place; and inflammation is always likely to follow rapidly upon congestion when the organ engorged with blood is one of great structural delicacy, like the kidney. Inflammation, however it arises and whatever form it takes, is a mischievous state: at the same time, I think the observation I ventured to make when comparing the endocarditis or pericarditis of gout with that of rheumatism is applicable to the case of the kidney. When the blood is loaded with fibrin, inflammatory action is more perilous than when the blood is only charged with an acid or salt, although these ingredients may be abundantly irritating. Therefore, on the whole, and without reservation, it may be said that the renal congestion and

even the nephritis of gout are not so urgent as those affections or states arising in the course of other diseases.

The indication in this first, neuralgic and irritative, class of gouty affections of the kidney is to wash out the urinary channels. The most obvious way would seem to be to give diuretics, but, looking to the facts : (1) that what we have to remove is a mechanically irritating material, and (2) that the organ is already hyperæmic, if not considerably congested, it is better to try to attain the object in view with as little excitation as may be. The best plan seems to be to increase the blood-pressure by endosmose of additional fluid ; thereby dilating the urinary tubes *laterally*, and endeavouring to overcome the block within them mechanically. This method has the additional advantage of rendering the blood more fluid, and thus increasing its solvent power so that the uric acid which is in excess will be less likely to crystallize. To carry the intention into effect, the skin must be kept fairly cool, without being *too* cold, and the patient must be induced to drink large quantities of some bland fluid. Weak tea is perhaps the best liquid with which to "flush" the kidneys, as it is slightly diuretic in its effects, and somewhat checks or delays the further destruction of tissue : which for the moment is an advantage, although, as soon as the urinary channels are clear, the more rapidly disassimilation can be performed the better will be the progress of the case and the more complete the recovery. Warm fluid of some sort must be taken in considerable quantity. There was once a question raised as to the safety of this mode of treatment, looking

to the possible weakness of the kidney tissues and the great pressure put on the walls of the blood-vessels in the glomeruli and the tubes of the kidney behind the impaction ; but that question could only, under any conditions, apply to cases of long-standing kidney disease ; and I have never seen or heard of any instance in which the results of this treatment have not been satisfactory. The mistake sometimes made in carrying it out is that the skin is kept so warm that perspiration ensues ; in that case, of course, nothing is gained ; or occasionally aperients are given, and the outflow is determined to the glands of the intestines. Obviously the pressure must be on the kidneys, or those organs cannot be thus mechanically relieved.

In Part II. will be found further details of this and alternative methods of treatment.

The specifically gouty affections of the kidney, not simply irritative, are of the same essential nature as the affections of other parts in this disease. The gouty materials (urates, &c.) are poured out either on the free surfaces of the lining membrane of the tubes, in the interspaces of the connective tissue, or among the special elements of the renal structure, with the result of setting up irritative inflammation and, by pressure, destroying the apparatus. In sections of gouty kidney white lines of urates are found marking the direction of the tubes, and particles of deposit block the openings of their channels at the apices of the pyramids. Parenchymatous inflammation produces contraction, and ultimately, partly by accumulation of deposits in the tubes, and partly by the destruction which results from pressure and

secondary inflammatory processes, the organ ceases to be able to perform its function. The small granular kidney is the result of these morbid processes. In some instances there may be abscesses set up in the kidney, as abscesses are produced around joints by the quantity and irritating character of the gouty effusions. The treatment for these advanced forms of kidney disease in gout is not unlike that indicated in kidney disease from other causes. The prognosis must be based on the extent to which the daily excretion of urine is accomplished, and the character of the fluid passed. The modifications of treatment necessitated by changes in the morbid state can be most conveniently set out in the manner pursued in Part II., and to this I must refer the reader for more specific suggestions.

Gouty affections of the bladder are generally of the nature of chronic inflammation and catarrh. In the treatment of this malady the *benzoic acid* and the *benzoate of soda* mixtures with *buchu* are of much value. Hip baths also help greatly in this and all other urinary troubles, whether renal or vesical. It is necessary to note in this connection a form of urethritis with a semi-purulent discharge which resembles gonorrhoea, and is not unfrequently mistaken for that malady. It not unfrequently precedes a first attack of gout in cases of the inherited disease. As a point of prudence, practitioners should always think of gout and search for it in cases where a urethral discharge appears to be gonorrhoeal, and the sufferer denies the possibility of its being so. This precaution will prevent some annoying and damaging blunders.

Stricture may be, and often is, caused either by the inflammatory thickening of the submucous tissue or effusions and deposits in the connective tissue underlying the lining membrane of the urethra. Prostatic enlargements and inflammations are sometimes of gouty origin, and so occasionally is orchitis. For the treatment of these special affections directions are submitted in Part II.

GOUTY AFFECTIONS OF THE BRAIN, SPINAL CORD,
AND NERVES.

I very much doubt whether true "metastasis to the brain" takes place in gout. It would be too bold an assertion to say that this change of place may not occur, nor is there any evident reason why it should not do so; but those cases of brain disturbance and disease in connection with gout which have fallen under my own observation have almost uniformly appeared to occur by gradual extension of the malady, or, if suddenly, by the occurrence of some accident for which the way was prepared by pre-existing, though perhaps unnoticed, disease. Thus, a patient with acute gout complains of pain in the head and exhibits the usual symptoms of cerebral irritation: little or no importance is attached to the hyperæmia and impending inflammation of the membranes which the subjective and objective features of the case clearly denote; he suddenly grows worse, and then we hear of "metastasis." I think this doctrine of change of place in gout, so far, at least, as it applies to affections of the brain, spinal cord, and the nervous system generally, is

an unfortunate one. As a matter of fact, there is an ever-present danger of the nervous system being affected in gout; partly because the disassimilation of its consumed tissue by destructive changes of the cholesterine in the liver is retarded, and partly because uric acid in the blood has a peculiarly irritating effect on nervous and especially cerebral tissue, sometimes producing a notable form of delirium, which has a tendency to degenerate into melancholia if the patient survive, or of extreme mental depression in the intervals between the attacks in subacute gout, developing by excitement into delirium when an attack occurs. It is worth noting incidentally that evidences of lead-poisoning and a blue tint on the gums are found in some of these cases; but of this more presently. Again, the walls of the vessels of the encephalon are not unfrequently the seats of gouty deposit, and liable to give way suddenly. It is on all these accounts important to bear in mind that irritative inflammation, the retention of effete material in the blood or tissues, effusion, or the giving way of a vessel and hæmorrhage, are complications which may arise at any moment in gout, and for which we ought to be ever on the watch; the respective effects of these states—namely, delirious excitation, depression with drowsiness and exhaustion, coma, epileptiform convulsions, apoplexy, or paralysis, either hemiplegic or paraplegic—being regarded as possible contingencies.

It is not necessary to dwell at length on these forms of gouty affection; but it is imperative to insist, very strongly on the need of keeping a careful watch on the manner in which the various nervous centres

are acting. With this view the state of the pupils should be noted at each visit; the expression of the countenance, and particularly the mental state, of the patient ought to engage the attention of the practitioner. Despondency and hysterical emotion are as common in acute gout as boisterous irritability or peevishness in chronic gout. It is not safe to treat these "moods" as mere changes of feeling apart from the disease. They are, in point of fact, integral parts of the malady, and of especial value as signs of the physical state, and indications for treatment, if only the practitioner will be at the pains to utilize them.

I think it is a point of clinical policy in dealing with gouty cases, whether in the attack or in the interval, and whatever may be the form of the disease, to take up a tentative position, and, without dogmatizing or insisting too strongly on any measure either active or passive, to wait on the indications from day to day and hour to hour. The malady is not only a mystery which science has not yet succeeded in penetrating, but it is Proteus-like in its capacity for change of form and expression. If we take the patient into our confidence, explain our method of treatment, and show him as clearly as may be what we want to accomplish, the assistance he can, and, *when fairly treated, will, give*, is of great use. I have not a particle of sympathy with the complaint that gouty patients are, as a rule, intractable. They are naturally much worried with their disease, which is at the best a miserably depressing one, and they not unnaturally grow impatient if we are not quickly successful in affording them relief; but this very

impatience, and the intolerance of certain modes of treatment to which it gives rise, I regard as significant, and directly indicative, *aids* in treatment. When any particular measure is especially distasteful it may be assumed as beyond question that it is not the best that can be adopted, and will probably fail. Therefore, instead of pressing a régime, or the use of drugs, which are not well tolerated, the practitioner will act wisely in abandoning his mode of attack and employing new measures.

This is not a digression. The remark needs to be made, and this is the place to make it, because it is in connection with the mental—that is, the cerebral—state of the patient indications of this class arise. If there be depression, irritability, or any special emotion or unrest of mind, there is need to regard, and probably to treat, the brain and nervous system generally as under the influence of the disease. The first indication is to look for and remove every discoverable cause of irritation; the second, to examine the most recent specimens of urine obtainable for evidences of retention of urea, and to adopt such measures as may soothe the nervous irritability, carefully avoiding the employment of drugs which, however “quieting” in their general effects, are likely to produce hyperæmia of the centres, or in any way to retard the rapid elimination and discharge of those products of disassimilation which it is characteristic of the disease to retain in the blood.

In acute stages of the disease the indication is for rest, but without stupefaction of the cerebral centres. In the intervals of attacks, and in the chronic form of the

malady, the indication is, I believe, rather to promote a healthful and recuperative exercise of the functions of both centres and nerves. The following remarks have appeared, in substance, though in slightly different form, in a medical periodical from time to time in connection with "the mental element in the etiology of gout," and, as the views expressed have been strengthened by more recent experience, I make no apology for their reproduction.

The persons who suffer most severely from gout are those who either inherit or have acquired a considerable faculty for exertion—or, in other words, great potential energy—and the period at which they begin to suffer from the affection is usually that at which they cease to consume or pass off this energy by transforming it into kinetic force, in work. Cases in which gout troubles its victim early in life are nearly always instances of a particularly strong inheritance, or of a complete change in the outlet of force. For example, a youth may inherit gout from his maternal or paternal grandfather, or great-grandfather—generally through the maternal line—and suffer early in life, because he is unable to take as much exercise as will consume or work off all the force he generates; or he may be incapacitated for this chemico-physiological function by having adopted a habit of life which is at too great variance from the habit of his ancestors. Thus, perhaps, they have worked with their muscles, and he works with his brain. It is, however, commonly in adult life that the gouty diathesis begins to develop itself, and the appearance of marked symptoms is generally synchronous with the cessation of accustomed forms of

individual work, whether intellectual or muscular. The man-of-muscle abandons his robust life, and the man-of-mind desists from or diminishes his cerebral exercise.

It is the equilibration of energy and force, of power and action, which is at fault. The whole body, with every constituent system, is energized by the same force that sets the brain in action and produces thought; and every chemico-vital process is originated by the mind, acting consciously or unconsciously, voluntarily or automatically. When the mind acts, so to say, without the body, the impulses are unsatisfied—as in nightmare—and there is no outlet for the products of this action, so that they have a tendency to accumulate in the blood. Myosin accumulates in the muscular tissue, and produces catalepsy, when, in the so-called “hysterical” state, the morbid mental condition inhibits action without arresting the impulse to act.

If I am right, the treatment of nervous gout under all its forms and varieties of actual or abortive development should be in the first place and in the main *mental*. The gouty constitution requires to be treated for the reduction or diversion of its mental and nervous energies, not less than for their physical results and products. In short, suppressed or undeveloped gout is like the subterranean operation of volcanic forces, the attack being the earthquake or eruption, with an outpouring of lava. If we are to deal with the *cause* of the disease we must equilibrate the mental energy with the organic or animal forces at work in the system. It is seldom enough to reduce the nitrogenous elements of the food, or to enjoin such

exercise as may seem likely to lead to the consumption of the supplies assimilated. It is necessary to command those mental impulses which set up the processes that make life a round of continuous activities mutually destructive unless correlated and controlled. The inheritor or self-producer of mental and nervous energy which ought to find its natural expression in action, either cerebral or muscular, will be gouty if that expression is prevented while the mental motor impulse is not itself inhibited. Gout is the night-mare of an organism constitutionally bent on action, and automatically performing the collateral and contingent chemico-vital processes normally attendant on action, while the action itself is omitted or restrained. The remedy must be sought in grappling with the motor energy, rather than in striving to obviate the train of morbid consequences to which its repression gives rise.

An "attack" of gout is particularly likely to occur, in the gouty subject, at either of two mental or cerebral crises. First, on the eve of a great mental effort, when the brain is, as it were, charged to the highest point of tension with what, for want of a better term, we call nervous energy. The type of a paroxysm so occurring is likely to be "nervous," with severe neuralgic pains, if the patient be neurotic, or visceral, in the sense of attacking one of the large organs, if he be robust and of an active habit. Second, an attack of gout is likely to occur at the end of any great intellectual effort, when the centres have been thereby exhausted; and in this case it may take the form of an epileptiform fit or syncope,

followed by a more or less prolonged depression ; or it may rapidly develop into an ordinary arthritis of the familiar type. In the break down before action I think the cerebral strength itself gives way ; while in the paroxysm after exertion the attack occurs because the inhibitory control of the cerebral centres over the medullary, spinal, and organic centres is suddenly suspended. The attack of gout has, so to say, been kept in abeyance during the period of cerebral activity, and breaks out immediately this ends. The former class of cases is the most serious, and attacks of this class go far to prove the existence of a neurosis, for which the patient may require to be specially treated. The second class of cases is one in which the malady proper, rather than the patient, demands the practitioner's greatest attention."

Gouty cerebritis, cerebral meningitis, spinal obstruction, if I may so call it, almost resembling sclerosis so far as symptoms are concerned, spinal meningitis, and partial paralysis of limited groups of muscles are not unusual in gout. When these complications do occur, they present the ordinary symptoms of such affections, easily recognizable by every practitioner, and which, as I am not writing a treatise on general medicine, need not be recounted here. This, however, may be remarked—namely, that *everything* as regards the efficiency of medical aid in these emergencies in gout, and the success of treatment for their relief, must depend on the fact that the gouty element in their etiology is instantly recognized, and—which is more—being known, utilized as an indication for specialty in the measures employed. For example, take such plain matters as those

attacks of hæmorrhage and consequent paralysis which occur in gouty cases : it is needful to act with extreme promptness for the remedy of these complications, and the measures to be adopted require to be less depletory and more stimulating than those commonly employed in non-gouty forms of the same morbid states. In short, it is not so much in the recognition that particular parts of the nervous system are attacked the difficulty arises, but in the instant appreciation of the fact that such a disturbance occurring in a gouty patient requires special treatment. The diagnosis of gout in a case of mental or nervous disease cannot, so far as I am aware, be safely made on the ground of actual difference in the symptoms. Distinctive peculiarities perhaps exist, but, if they do, the shades of difference are too slight for rapid discrimination. Is the case or the constitution gouty ? That is the question to be asked. If it be so, then, without delay, the remedies appropriate for gout in the particular form before the practitioner must be exhibited. To facilitate a ready selection, I have grouped the suggestions to be made in Part II.

GOUTY AFFECTIONS OF THE EYE, THE EARS, THE NOSE, AND THE THROAT.

It would be incompatible with my scheme to dwell at length on these special affections. My purpose is limited to such an outline of the clinical facts relating to the several forms of gout as may help the practitioner to perceive their specific character, and to give such prominence to this qualifying condition of their

treatment as may be needful in the choice of remedies and general management.

A specially irritable condition of the eye, often induced by prolonged reading or visual disturbance of any kind, is apt to come on suddenly with pain, stabbing in the globe or pricking in the lids, heat, weight, and sometimes dulness of vision. This is, unquestionably, of frequent occurrence in gouty patients, and when it occurs in the case of persons not known to inherit gout, with the significant accompaniment of a discharge of urates at the end of the attack, which may last either for an hour or a day, and recur periodically, it may be reasonably concluded that gout is at the bottom of it. The connection of iritis in several of its forms with arthritic gout is well recognized. There is no proof that urates are locally deposited in that malady or in others of the best-known gouty affections of the eye, but the mode of the attack is essentially paroxysmal, and it subsides with a more or less copious deposit of urates in the urine as a marked feature. When this is not perceived, the case is either not gouty or the urinary phenomenon has been overlooked. I should doubt the evidence of any case in which this characteristic were really wanting. Iritis is the commonest gouty affection of the eye except the neuralgic and that unformulated painful and burning eye to which I have previously alluded. Women are more commonly affected with orbital neuralgia than men, and the fact accords with the view previously taken in relation to the frequency of nervous varieties of irregular gout in the female members of gouty families. It is thought by some that glaucoma may be sometimes

gouty. On this point I am not competent to offer any opinion, but there can be no question, I think, that optic neuritis may be of gouty origin. I am confident that specifically gouty inflammations attack other nerves, and why not the optic? There would seem to be two groups of gouty affections of the eye; in the one the pain is very severe, and the attack generally extremely acute, while in the other group the morbid processes are slow, and not of a nature to attract attention. This last-mentioned group is the most important, as its destructive effects are the greater and the less remediable if overlooked at the outset. It is therefore imperatively necessary to urge the practitioner who may have the care of families in which gout is hereditary to be ever on the alert for insidious affections of the eye, and to impress on those who, without an intimate acquaintance with the unique speciality of ophthalmology, are called upon to treat "eye-diseases" to inquire carefully into the family history of every case not quite evident on the face of it for gout; and, in the event of even presumptive evidence of the disease being forthcoming, to employ measures directly for that disease, which, as a rule, need not interfere with the use of more topical remedies. (See the suggestions in Part II.)

Catarrh of the middle ear, whether arising locally or by extension through the Eustachian tube from the pharyngeal membrane, is, I believe, in a very large proportion of instances, of gouty origin; and urates are deposited between the layers of the membrana tympani when that structure becomes involved, with the result of rendering it incapable of vibration, and of producing

what may be termed *mechanical* deafness. By the use of a Galton's whistle it is possible in these cases to ascertain that the very small vibrations necessary to propagate high notes can often be made when the rigidity of the tympanic disk does not admit of its being thrown into vibrations of larger amplitude and transmitting lower tones. This is a curious differentiation, showing also that deafness may depend entirely upon the failure of the transmitting media to pass on the waves of sound while the auditory nerve-centre is in normal condition. (See Part II.)

Throat affections, particularly some of the most intractable forms of follicular pharyngitis and the *dry* throat, may beyond question be gouty, and require to be treated as such if they are to be relieved. Gouty inflammation of, and deposits in, the larynx, with deposits of urates in or beneath the vocal cords, are easily recognized. The evidence of gout in these cases needs to be conclusive, but is generally forthcoming in connection with the family history and in the state of the renal excretions, even though there may be no clear evidence of arthritic gout in the individuals presenting these anomalous forms of the disease. As a rule, they occur chiefly in members of gouty families not themselves gouty; and in greater proportion among females than males. They are also more common in the alternate generations when the descent is atavic. For such suggestions as I have been able to make for special treatment, see Part II.

GOUTY AFFECTIONS OF THE SKIN.

Psoriasis and eczema are the best-known of gouty skin diseases. The only points in which they differ from the more familiar forms of the same affections without a gouty element are that when there are general evidences of accumulation of uric acid or urates in the blood—for example, heaviness, dyspepsia, a dark colour of the skin with perhaps heat, fulness of the venous system—there may be paroxysms of excessive pricking, tingling, or itching in the parts affected; and that after these subside there will be a discharge of thick urine, which, on examination, proves to be loaded with urates. In rare cases a peculiar white dust has been noticed in the psoriasis of extremely gouty persons. I have also seen cases of undoubtedly gouty herpes and urticaria. The history of gout in the family or in the individual is the strongest presumptive evidence we can obtain. The very remarkable affection of which “the glossy skin” is a symptom is characterized by nervous disturbances which are in part paretic and in part irritative. It is, I believe, an affection which consists in gouty inflammation, with thickening, of the sheaths of the musculo-cutaneous nerves. There is also a form of scleroderma, with melancholic symptoms, which needs to be mentioned in this connection. Both these maladies are gouty. I have grouped suggestions for local and general treatment in Part II.

This brings us to the end of a bare enumeration of the facts and indications which it is needful to keep in memory in connection with the gouty affections of

special organs and structures. If the purpose had been to investigate or discuss the pathology of this most important and interesting class of affections, the facts collated must have been greatly more numerous and the descriptions attempted more detailed and precise. For strictly clinical purposes, however, we need chiefly to note the specialties of development and association in regard to symptoms and indications with which we are all sufficiently familiar. Not the affections themselves, but the gouty elements in their etiology, have formed the subject of remark.

CHAPTER X.

GOUT IN WOMEN.

IT is a mistake to suppose that gout is a disease which rarely attacks females. As a matter of fact, it underlies, and is the main, if not the manifest, cause of, a very notable proportion, not only of the affections from which women suffer, but of the diseases supposed to be peculiar to their sex. It would be a great gain to the interests of health and happiness of this part of the population if the gynæcologists could be induced to reconsider the views of the humouralists, and to inquire, seriously and without prejudice, whether it is not possible that, when the blood is vitiated by the retention among its constituent parts of products of disassimilation which ought to be expelled, there may be an effort of the organism to open up a new channel of escape for these débris by the establishment of local fluxes. There is much ground for thinking that this *may* be the case ; and, if it be so, it is easy to see how hypertrophies, and proliferations, and inflammatory exudations may be incidentally produced, and how the nutrition of special tissues will be so perverted and degraded as to lead to the multiparous reproduction of super-nucleated cells and the development of morbid growths. I will not trespass further on the dubious province of conjecture, but simply urge that the line of

inquiry to which my suggestion points is one which it is worth while to pursue, even though it should seem to lead the scientist to retrace his steps for a moment to pick up a dropped clue.

In my own experience, the female members of gouty families are seldom free from irregular forms of the inherited disease, and in a not inconsiderable proportion of instances they actually suffer from arthritic affections with nodes, or tophi, which place the fact of their participation beyond question. Generally speaking, no doubt, the gouty affections prevalent among women are of irregular form, and present special characteristics. Thus they are peculiarly prone to forms of gout which affect the nervous system, and with the tendency to mimetic developments, so common in the diseases of women, these neurotic troubles not unfrequently put on the characteristics of graver maladies, for which they are mistaken, and treated, to the disappointment of both patient and practitioner; the former finding no relief, and the latter perplexed to determine why his remedies fail. I have seen many of these mimetic cases of gouty origin recently in which the symptoms of kidney, stomach, heart, and throat diseases respectively have been so closely simulated that it has been a matter of chance almost that the all-important discrimination has been made. Nephralgia, cardialgia—scarcely distinguishable from ulcer, or even malignant disease, of the stomach, even with “tenderness on pressure”—nervous weakness, with intermission of the heart, laryngeal and pharyngeal troubles, with congestion, and, in some instances, ulceration, are common in cases of unde-

veloped or irregular gout occurring among the female members of gouty families. Neuralgiæ of the ordinary class affecting the branches of the fifth nerve have, I believe, in a very large proportion of instances gout for their predisposing cause; and, together with these affections of the nerves, in which pain is the prominent symptom, cases will be found of spasm, either clonic, producing choreic movements, or tonic, as in torticollis and similar disturbances. It is impossible not to be struck with the increased frequency of these cases in late years, and with the fact that the sufferers are nearly always females, and gouty.

I am also disposed to lay stress on the frequency with which a gouty history is discoverable in cases of painful inflammatory affections of the uterus, the ovaries, and the pelvic ligaments. The proposition is difficult of proof, but it is one which certainly needs to be entertained in connection with the clinical aspects of gout, that in no inconsiderable proportion of cases of this class the gout element plays an important part. It is a matter of experience, apart from theory, that, when cases which have been long under ordinary treatment with little or no result are treated for gout, relief is speedily obtained, and within a much shorter time than might be expected to be occupied in the removal of long-standing obstacles to recovery, a "cure"—or what seems to be one—is happily effected.

One especially noteworthy manifestation of gout in females is a form of dyspepsia with a sense of weight and oppression at the epigastrium, accompanied by great distension of the abdomen, causing considerable distress and often much anxiety. There is, not uncommonly

also, pain of a dull aching sort on the left side of the thorax, below the breast, referred to the heart, with a feeling of soreness, increased by movement or pressure. The seats of the disturbance, which causes this suffering, are the gastric and cardiac plexuses of the sympathetic system; and the excitation is reflected from the solar plexus. It is not improbable that the remote irritation is located in the uterus. The tongue is coated at the back, and becomes parched, particularly at night. Sleep is disturbed or harassed with disagreeable dreams. Headache, and periodic fever, aggravate the case; so that unless the urine be examined and the true nature and cause of the affection be perceived there may be needless alarm, while, the gouty element in the case being undiscovered, relief, by treatment, is improbable.

The gouty affections of females offer a wide field for the investigation of the specialist, while to the general practitioner of medicine it is of the highest advantage to recognize that gout may be at the bottom of some of the most intractable diseases of women he is called upon to treat. In Part II. will be found a series of formulæ which I have found of service in this class of cases, and which I am disposed to recommend.

CHAPTER XI.

GOUT IN CHILDREN.

No one can doubt that gout—or the organic basis of the gouty habit—exists in childhood. That assumption is, of course, a necessity of the belief that the disease, or its cause, is transmitted from parent to child and inherited. What those who question, or deny, the existence of this malady in children must mean is that they do not recognize gout among the diseases of childhood. In so far as regular forms of the affection are concerned, this may be admitted; indeed, on physiological grounds it is unlikely that very young children would, except in very rare instances, develop gout, because, as we know, hippuric acid, which is much more soluble than uric acid, to a great extent takes the place of the latter during the earlier years of life in the human organism. Or if that be a too broad statement, inasmuch as uric acid is always present in the urine of omnivorous man at all ages, let us say that hippuric acid exists side by side with uric acid in such quantities in childhood that accumulation of the less soluble acid is improbable. Meanwhile, there are one or two facts which should be borne in mind, having a very interesting and, as I conceive, important bearing on this question. It is by no means unusual to find, in the kidneys of infants who have died between the middle

of the first and the end of the second week after birth, crystals of uric acid, or urates, crowding the straight tubes. The presence of these precipitates is apparent to the naked eye in the shape of yellow lines marking the pyramids and papillæ. Occasionally accumulations of these crystals are found in the pelvis of the kidney also. It is not a congenital blocking of the tubes, as it is not found in the kidney of children who are born dead or die before the second or third day. In short, the phenomenon is comparable with that of icterus neonatorum, and, I confess, it seems to me to point to that connection between liver function and uric acid excretion which I have already remarked as indicating the use of the taurocholate of soda to compensate the deficiency of the biliary salts. This deficiency may be one of the primary causes of that disorder of the processes of assimilation and disassimilation out of which the morbid state arises. In any case, it is significant that precisely the same infarction of the urinary tubes which is found in the kidneys of gouty patients dying during an attack is found in the kidneys of fifty per cent. of the infants who die within a fortnight of birth, provided they have lived long enough for the functions of organic life to have been fairly established.

Regular forms of gout are not common in children ; indeed, they are rare ; but I think I have seen acute gout in infants even during the period of suckling. I have no doubt as to the gouty character of inflammatory swellings of the joints occurring, with distinct pyrexia, and subsequent peeling of the skin of the swollen limb, as early as the third year,

the urine, at the subsidence of the attack, depositing thick precipitates of urates. Irregular forms of gout are certainly by no means infrequent among the children of parents who have the disease strongly developed. Even arthritic nodes are far from uncommon. I have seen a boy barely in his teens with fingers already deformed; and a youth a few years older with "chalk stones" extruded by ulceration from the fingers.

Gouty deafness in children is a familiar affection, the deposits being visible through the out-layers of the membrana tympani. Concretions are also to be found in the cartilages of the ears of children; some of the so-called "cretaceous" accumulations under the prepuce are gouty, and I believe gout is responsible for not a few of the attacks of vaginitis or vulvitis which are occasionally attributed to the irritation set up by worms. A severe attack of this local affection, of very perplexing character, has been interpreted by the sequence of a fully developed attack of arthritic gout. Cases of this description are not, perhaps, of every-day occurrence, but they are sufficiently numerous to put the practitioner on his guard against the error of assuming that there is no such disease as gout in children.

CHAPTER XII.

LEAD-POISONING AND GOUT.

THERE are not, as yet, many ascertained facts in connection with this very interesting and important subject, and therefore very little can be said. It is, however, beyond question that when an inheritor of the gouty constitution happens to be so placed as to be poisoned with lead, either by drinking water impregnated with that metal from leaden cisterns or pipes, by drinking acid beer which has stood in a pewter tankard or in the pumping apparatus of a tavern for some hours, by contact with paint or pewter pots, as in cleaning them, or, in short, in any one or more of the many and strange ways by which lead is introduced into the organism, he will not simply suffer as a non-gouty man might suffer, but experience, and present, a curious combination of the two morbid states—the lead-poisoning and the gout. If, on the other hand, a subject of lead-poisoning should originate or develop gout in his organism he will be affected in a similar manner. Moreover, the existence of the one disease or disturbance appears to increase the probability of the other occurring also; and when lead-poisoning and gout combine there is especial peril of brain and nerve complications. Mental derangement, chorea, and nervous troubles generally are common results.

If it be permissible to indulge a little in speculation

on this subject, we may suppose that the dissemination of lead in the organism is, in fact, the distribution of a base with which uric acid circulating in the blood readily enters into combination. We must not expect to find a distinctly blue line on the gum, but rather a dirty green tinge at its margin, with a mottled appearance of the tissues around. There will also be a tendency to swelling of the lower lip, with intractable ulceration of its inner side; and not uncommonly inflamed and ulcerated spots will be found at the corners of the mouth, at the junction of the lower lip with the skin, at the margin of the nostrils, and at the junction of the eyelids. The relations of lead-poisoning and gout present features of considerable clinical interest, and invite the attention of the practitioner, first, because there is undoubtedly an aggravation of the uric acid diathesis due to lead-poisoning, and, second, because the measures adopted for the treatment either of lead-poisoning or of gout in such cases must be so devised and directed as to fulfil the indications of the two diseases. My own experience has led me to look very carefully into this matter in all cases of gout particularly occurring among patients who have recently taken up their habitation in new houses, or had their premises repaired and refitted. It is surprising to note the rapidity with which the effects of poisoning by lead are developed in gouty patients so placed. The varied character of the symptoms presented is, also, very remarkable. There may be palsy or colic or diarrhoea or chorea. The brain may be affected as with alcoholic poisoning, in which event the case will look like one of delirium tremens, or there may be formulated

insanity, either maniacal or melancholic. The treatment most successful and obviously indicated consists in the prompt and continuous administration of full doses of acetate of potass, with an excess of acetic acid in the mixture. (See the formulæ in Part II.) It seems not improbable that other metals strongly impregnating the organism are, like lead, prone to attract the uric acid and offer it widely extended and firm combination. On this account I think it is desirable to avoid the use of iron, copper, arsenic, mercury, silver, and, as far as possible, calcium and ammonium in gouty cases.

CHAPTER XIII.

GOUT AND SYPHILIS.

It is impossible to pursue the study of gout in its clinical aspects very far without being convinced that it is a constitutional disorder, and that it renders the organism an especially easy prey to many other diseases, one of the most damaging of which is syphilis. In a passing remark on Charcot's disease (pages 64-66), I have pointed to what I conceive to be the morbid alliance into which gout enters with syphilis; either directing the force of that ruinous malady upon the nervous system, or, if it chance to have such a tendency in the individual case, enhancing the malignancy of its attack. I do not assert that gout + syphilis = Charcot's disease; but I doubt if we should greatly err in stating the proposition thus:—gout + syphilitic tabes = arthrosia hydrarthrosia, which in its development is extremely likely to produce a pathological condition essentially like that described by Charcot. However this may be, it is beyond question that when a gouty patient contracts syphilis, that disease usually assumes a form which is characterized by a very wide distribution of its effects over the organism, and by the exhibition of a peculiar affinity for the nervous centres, and, if I may venture to generalize, particularly the centres of co-ordinative and sensori-motor activity,

commencing on one side, nearly always that on which the original chancre existed, and progressively extending to the other, until the functions of both are seriously impaired. It is impossible to be didactic on this subject; but I may venture to set down in interrogative form two or three considerations which, if not conclusive in my own mind, are certainly of a nature to which I am disposed to attach especial weight.

1. May not the explanation of certain curious coincidences in connection with syphilitic *tabes spinalis* (Gull), such as the occurrence of this disease in members of the same family, with special joint affections be, that gout underlaid and modified, if it did not control, the manifestation of the specific disease?

2. Is there not reason to believe that the crises in *tabes* are determined by gout when, as very commonly happens, they end with a sudden and copious discharge of urates in the urine?

3. When *tabes* is characterized by renal or vesical crises, with gravel or calculi, is not the subject of their attack generally an inheritor of gout?

4. Are there not special forms of syphilitic *podagra*, *gonagra*, and *chiragra* with distinctive "lightning pains," which linger longer than the ordinary pains so-called and are commonly described as "burning" or "tingling," or of the nature of "nettle stings," affecting small areas of the skin in patches lying in the course of the principal nervous trunks, coming on periodically, persisting for six, or eighteen, hours, or in some instances longer, disappearing suddenly with a discharge of urates, but leaving behind them in the seats of pain tumefactions which resemble the patches of *erythema nodosum*

following rheumatism, but without the redness? And do not these particular forms of the tabetic affection nearly always occur in connection with gout, or in the children of gouty parents?

I will not go further into the matter, as I am not prepared to discuss the subject as alone it should be discussed, on the basis of a large number of *facts*; but I will throw out the hint that this is a matter which may very usefully engage the attention of practitioners, and on which their researches would tend to throw much light. Beyond question there *is* a close relation of mutual susceptibilities between gout and syphilis. Whether the morbid state of the blood, when it becomes charged with uric acid or sodium urate, either by absorption from the kidney or accumulation, renders the organic constituents of the nutrient fluid more susceptible than they would otherwise be to the influence of the specific organic virus of syphilis; or whether the effects produced are simply due to the disturbance, on the one side in assimilation, and on the other side in disassimilation, I will not attempt to determine; but it is manifest that syphilis grafted upon gout is more injurious to the constitution, and establishes a dyscrasia with greater celerity, than syphilis acting alone in the non-gouty subject.

It is of moment to recognize the existence of the gouty constitution early in a case of syphilis, because the mercurial treatment seems to be by no means the best under the conditions set up by the combination of the two maladies. I do not think mercury should be given in these cases, or, if it be, the quantities exhibited ought to be small, and the system should not be

brought completely under its influence. I am content to dress the chancre in such a case with a powder composed of calomel and carbonate of lithia in equal parts, and to establish and maintain until the sore is thoroughly healed, and for some weeks afterwards, a free diuresis. The formulæ appropriate for the carrying out of this plan of treatment will be found in Part II.

CHAPTER XIV.

GOUTY ALBUMINURIA.

I DO not propose to say more on this subject than that I believe there is a special form of albuminuria which occurs in the inheritors of gout, and ought to be regarded as traumatic in its mode of causation. It is probably due to the result of mechanical injury done to the lining membrane of the tubes of the kidney by the crowding within these channels of uric acid and ammonium urate crystals. The quantity of albumen in the class of cases to which I refer is very small, seldom more than a trace. There are, however, generally a good many loose epithelial cells, and casts, containing cells and not unfrequently also crystals of uric acid; and there are likewise to be found in the urine crystals of uric acid and urate of ammonium so agglomerated as to form globo-stellar combinations. Some of these are figured in Part II. The prognosis is in the majority of instances favourable (page 20). The form of albuminuria to which I allude does not appear to be connected with the development of the small granular kidney. The proportion of cases in which such traumatic albuminuria with casts and crystals combined, and perhaps a few blood corpuscles, are found, but no other symptom of renal trouble is presented, at least for many years, is considerable. I have had

opportunities of making repeated examinations of the urine in such cases after intervals of ten or twelve years, and have found no trace of albumen, and no casts, and failed on the closest scrutiny to detect the least evidence of existing disease. The "gouty kidney" is a fact which, unhappily, no one can gainsay; but I think these cases of *traumatic* albuminuria are wholly different, and quite apart from that disease.

CHAPTER XV.

GOUTY OXALURIA.

IT must be manifest to all who see much of gout in families that there is a remarkable connection between the gouty state and the oxalic acid diathesis with oxaluria. The subjects of this trouble are chiefly females. Their symptoms are those of nervous irritability, with anomalous disturbances of the digestive function and considerable mental excitement, or depression verging on melancholia. The physical characteristics of these patients are various, and even apparently contradictory. Thus, some are distinguished by a tendency to accumulate fat, while others are strikingly thin. There are also great differences in the colour of the skin, some being pale and anæmic, with a peculiar muddiness of the complexion, while others are inclined to be florid, and change colour with exceeding rapidity on the slightest emotion. They are often hypochondriacal; and they suffer much from follicular pharyngitis and bronchial catarrh. Iron seldom agrees with these patients. They resist direct remedies for their relief, and their cases give the practitioner much anxiety. On examination their urine will generally be found highly acid, and crystals of oxalic acid will be recognized, with epithelial cells, some of which come from the infundibulum of the kidney. They are also

as a rule very subject to "cayenne pepper" deposits of uric acid. Males are affected in a similar manner, though not so frequently, and in their cases there is very apt to be *spermaturia*, with abundant mucus in the urine. These cases are unquestionably gouty, and the state which their symptoms express—namely, the oxalic acid diathesis with oxaluria as a consequence—is easily explicable on the principle which the most recent investigations and hypotheses in connection with the formation of urea appear to illustrate—namely, that the liver forms the urea, while uric acid is a kidney product. When the liver function is defective, and the leucin and glycosin are not duly converted into urea, leucin and tyrosin are found in the urine, but the glycosin by oxydation is converted into oxalic acid, and hence the morbid state. The treatment for this state should, I think, be essentially aimed to restore the integrity of the liver function, and to this end taurocholate of soda in pills will contribute very considerably. (See formula, Part II.) The "vertige stomacale" of Trousseau, in which the patient sees the objects around him tumbling about and rolling over, or in which he feels his head "light," or "empty," or "immensely large," or has sensations of a morbid character, almost amounting to delusions of sight, hearing, or sensation, or all three combined, formulated as agoraphobia, claustrophobia, and the like, is, I believe, due to the circulation of oxalic acid in the blood, and this is generally part and parcel of the gouty trouble, and proceeds from the same cause. Great benefit has, in my experience, been derived in this class of cases from the use of the benzoate of sodium

and the valerianate of soda, either separately or together, with serpentaria, in one or other of the forms which will be found in Part II. These cases are very intractable, but in the end they generally yield to treatment or recover suddenly, and not improbably with the passage of a large amount of gravel, or calculi of small size which prove to be composed of oxalic and uric acid elements irregularly combined.

PART II.

TREATMENT AND FORMULÆ.

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CHAPTER I.

TREATMENT OF ACUTE GOUT.

(See pages 25-53.)

SURROUNDINGS OF THE PATIENT.—An abundant supply of pure air is essential. The need for oxygen is great. In cold weather a fire in the room is desirable as much for the purposes of ventilation, to draw off impure air, as for heat. In warm weather a free and full current of air through the room will be advantageous; but avoid draughts, particularly in spring. The temperature of the apartment should be carefully regulated so as to be agreeable to the patient. As a rule it may stand at about 60° Fah., not higher, throughout the twenty-four hours. When the external atmosphere is heated to a higher point than this, as in summer, measures ought to be adopted, where practicable, to reduce the temperature of the apartment. A large block of ice may be introduced, or a sheet wetted with salt water may be suspended in the room, for this purpose. In excluding the sun by blinds avoid darkening too much. It is very undesirable to give a mentally depressing appearance to the chamber in which a patient is lying ill of the gout. Noise must be prevented, and, above all, any shaking of the bed, but it is important that an air of cheerfulness and confidence should surround

the sufferer. The indication for careful management of the temperature is to prevent perspiration, because that diminishes the kidney secretion, which it is all-important to increase. The bed-clothes should be light. An eider-down quilt laid over a single blanket-sheet, not *linen*, as it strikes cold, or a light blanket, will be enough. If the patient desire to lie warmer, let the temperature of the room be raised rather than use thicker or heavier clothing. In all cases, whether it be desired or not, let the clothes be raised from the affected parts by a cradle, which may be either made with hoops or fashioned out of a basket. The actually inflamed parts must be placed high that the blood may return freely through the veins. The bed-clothes should be kept well away from the limb, so that the air may play freely around it. See that proper provision is made for passing water frequently, and for relief of the bowels. Harm is often done by checking the desire to empty the bladder because it involves trouble and pain. The practitioner should satisfy himself on these points before leaving the room at his first visit, and see that the arrangements made are such as to secure perfect ease and facility, or himself devise new measures. It is not safe to leave these really important matters to any nurse, however experienced. Express directions should also be given that all the urine passed shall be saved and measured in ounces, any specially "thick" portion being preserved in a separate vessel and measured separately. A register of the quantities ought to be kept by the nurse and shown to the practitioner when he inspects the urine at each visit. See also that the patient is so placed in

bed and provided with supports that his position is not cramped, that slight changes may be readily made at will, that he may be free to move the unaffected parts, and that he be neither allowed to sink uncomfortably in the bed nor compelled to lie in a constrained posture. The object is to secure a minimum of pain, of discomfort, of heat, and of unrest. This preliminary endeavour to establish *conditions favourable to ease* will greatly facilitate the treatment.

LOCAL MEASURES.—Dust the skin of the inflamed part with oxide of zinc, using a flour dredge or pepper-castor for the purpose. Let the surface be completely covered with the powder. Then envelop the part in a somewhat thin sheet of absorbent wool—which should be of loose texture, not compressed. Outside this apply a loose wrap of dry flannel. Let the flannel be in a single layer, that the part may not be kept too warm. This application must be made with great delicacy, so as to avoid pain. The practitioner should apply the wool and flannel himself on the first occasion, giving *precise* instructions to the nurse to renew the dressing—for such it is—whenever the patient complains of uneasiness, or desires that a change may be made. If there be great tension or much “bursting pain,” the foot or limb may be carefully held up, and a basin of very hot water introduced beneath it, so that the part may be enveloped in a cloud of steam. Some of the hot water may then be lifted with a sponge, and allowed to flow gently over the surface, not being dropped or poured from a height, but simply passed lightly over it. This should be continued as long as it is agreeable—say for five or

ten minutes—and then the skin may be covered with the oxide of zinc, and the wool and flannel applied as above. A gouty foot or joint should be dressed as gently as a burn, and very much on the same principle. The inflammation of the skin and subcutaneous tissues is very great, as shown by the subsequent peeling; and, in many points, the superficial hyperæmia and irritation approximate to the conditions of erysipelas.

DIET.—The obvious indications in gout are to sustain the vital powers and supply nutriment while diluting the blood and securing a copious flow of fluid through the kidneys. We must not diminish the solid constituents of the blood, but simply try to augment its liquid part. The increase of tension will not complicate matters, but rather tend to remove the block in the renal tubes by lateral pressure. At the same time, by rendering the blood more fluid, we increase its power of holding the uric acid or sodium urate, with which it is loaded, in solution, and thereby reduce the tendency to deposits. Fluids of low specific gravity must be given in quantities as large as the patient can comfortably take them. Mutton-broth should for the first few hours be administered freely. It ought to be well made, and not deprived of the fibrin of the meat, as, although we want the fluid part to be taken up by endosmosis from the stomach, it is desirable that fairly stimulating food should be passing through the duodenum, stimulating the liver to discharge both its *secretory* and its *excretory* products: the former (the biliary salts, &c.) to be taken up in the small intestines and aid in the solution of the cholesterine, and also, perhaps, the uric acid in the blood; and the latter

(the excrementitial part of the bile) to be evacuated in due course with the fæces. After the first eight or twelve hours, strong beef-tea may be substituted for the mutton-broth. Milk diluted with a third part of hot water, a little salt being added, may be taken freely, and a small glass of light hock or Grâves should be given every second or third hour. The allowance of this wine may be a bottle in twenty-four hours for ordinary cases, or, if the habit of life has been to take much stimulant, a bottle and a half; or a bottle of very dry champagne may be substituted. Pains must be taken to secure thoroughly sound wine with a minimum of liqueur in it. If champagne be used, a champagne tap may be screwed into the cork to prevent its getting too flat to be palatable. A beverage of some kind, and by preference warm, ought to be always within reach of the patient, and he should be encouraged to drink as freely as possible. If solid food be greatly desired, even at the outset, a light custard pudding or a quickly poached egg on toast, will be suitable. Whipped eggs are easily digested. A boiled or broiled sole, or any other fish in moderate quantity, may be given if preferred. After the first twenty-four hours, a mutton chop, or a little game or chicken, will be relished, but until the development of the attack is complete, and the urates are beginning to escape in the urine, meat in a solid form is not desirable; when that point is reached it *is* desirable.

TREATMENT.—The practitioner must now elect which of several plans of treatment he will adopt, and, in order that he may make his choice in full knowledge of the facts, he should, either before he prescribes, or

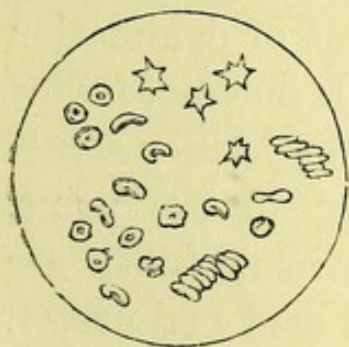
between his first and second visit (the latter not being deferred for more than six hours after the first), examine the urine. He will for this purpose secure some six ounces of water—passed since the attack commenced, and taken from a chamber which has been in use for some hours—and note its specific gravity. He will then ascertain the general characteristics of the excretion as to colour and acidity, and test for albumen by boiling first without, and then with, nitric acid. I am convinced that these tests are quite enough for practical purposes, but the highly sensitive test papers devised by Dr. Oliver, of Harrogate, for *quantitative* examinations of the urine may be trusted for good results; and they are extremely convenient in use. He will test for sugar by boiling with sulphate of copper and liquor potassæ, or with one of Dr. Oliver's indigo-carmine test papers;* and he will then proceed to make the most important examination of all—namely, that for the proportional quantity of urea. The hypobromite test made with Motherwell's apparatus (page 187), as simplified at my suggestion, is the most manageable, and sufficiently accurate. If it be a fact, as alleged, that a certain percentage of the nitrogen is lost in this process the omission is on the side of safety and in favour of the patient. Next the practitioner will not fail to scrutinize the sediments under the microscope. In order to facilitate the process of examining the urine in gout, it may be convenient to recall the stages of the process and the leading facts to memory as follows:—

* These very admirable test papers can be obtained in a compact pocket-case from Wilson & Son, chemists, Harrogate.

All urine passed must, as I have said, be preserved and measured in ounces, but the portions passed at different periods of the day and night may be kept apart, if they differ in appearance. By examining them separately it is sometimes possible to discover a rhythmically alternate discharge of urea and phosphates; not apparently bearing so close a relation to meals as to periods of recurring mental anxiety. I have, for example, found a morbidly anxious patient, upon whose mind special anxieties seemed to prey at particular hours of the day or night, pass phosphates in excess immediately after this mental excitation, but at no other period of the twenty-four hours, while the bulk of the urea passed in the twenty-four hours was voided some two or three hours after each copious discharge of phosphates. It is not possible to lay down any fixed rule as to the quantity of urine a gouty patient should pass in twenty-four hours, but, if there be not much perspiration and a good deal of fluid is consumed, the total ought not to fall below three and a half pints. Much, of course, must depend on the amount of fluid taken. This, therefore, should also be measured. The nurse is to be instructed to keep a careful note of the food, and particularly the fluid, given, with the time of each administration, and the quantity *actually taken*. The periods of passing urine ought also to be noted, and it is well that the measurement should be made, at the time, in ounces. A specific gravity below 1012 must be regarded as suspicious, and lead to a careful examination for albumen. If the density be above 1027, unless there happen to be a large discharge of urates, a special scrutiny should be

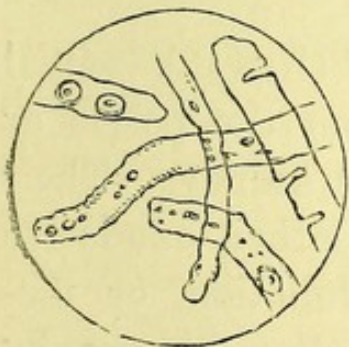
made for sugar. The specific gravity at each examination ought to be registered in the Case-book, as the proportional quantities of urea and urates must be studied in connection with the density; otherwise a large proportion might be interpreted to imply a free discharge when, on account of the concentrated quality of the water, or the smallness of its total quantity, the amount of urea or urates voided may really be markedly deficient. Boil a portion of the urine in a test tube over a spirit lamp. If it become clouded, there is either an excess of phosphates or albumen. To determine which causes the cloud, add a single drop of nitric acid carefully. If the cloudiness be due to phosphates, it will quickly disappear on again boiling; if the cloud remain or increase, there is albumen. Should this be the fact, a further examination may be made by taking another portion of urine in a test tube and allowing a drop or two of strong nitric acid to trickle down the side of the tube into the urine, when, if there be albumen, a white film or slight cloudiness will be observed where the two fluids are in contact; or one of Dr. Oliver's compound potassio-mercuric iodide with acid citric papers may be dropped into a test tube with enough urine to cover it, and the albumen will be thrown out in a way which renders the estimation of quantity practicable; or Dr. George Johnson's picric acid test may be applied. I am, however, strongly of opinion that, whatever may be the fact as regards the detection of albumen in ordinary cases of albuminuria, for the clinical purposes of the practitioner in connection with gout he will not greatly err by keeping to the old-fashioned heat and nitric acid test with which every

one is familiar. If there be albumen, the boiling with a drop, or two drops, not more, of nitric acid should be continued until all the albumen is thrown down, and the tube then put aside that the deposit may settle, and an estimate be formed of its quantity. Meanwhile, search must be made with the microscope for blood in the urine, which may account for the albumen.

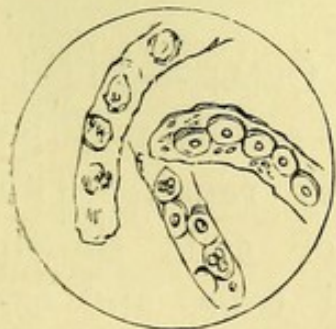


BLOOD CORPUSCLES.—Some of the disks are seen edgewise, some in a state of exosmosis, some in piles like coins; when found in this combination, the blood may possibly come from the urethra.

Or there may be casts of the tubes of the kidney. The following are the principal forms of casts:—



HYALINE CASTS.—One fissured. One containing two epithelial cells. One, lying nearly transversely across the field, has free nuclei scattered through it. Another rising curved from below shows a broken epithelial cell and several free nuclei.

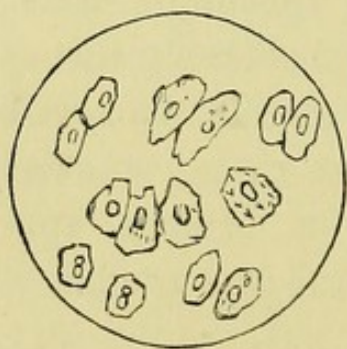


EPITHELIAL CASTS, containing renal epithelial cells and at the same time slightly granular.

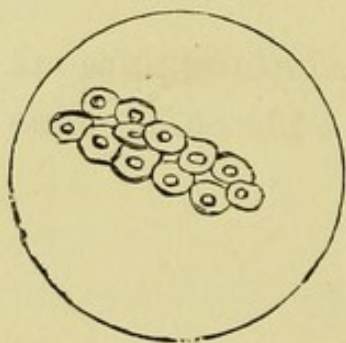


GRANULAR RENAL-TUBE CASTS, more or less loaded with fat-granules. In the curved cast at the bottom of the field there are two renal epithelial cells.

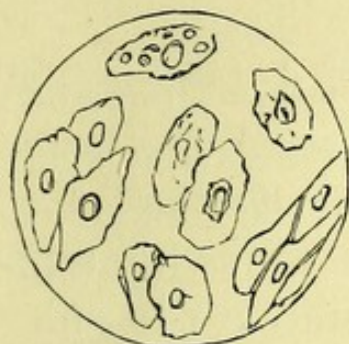
Or, perhaps, there may not be casts, but the epithelial cells present will help to show the seat of denudation of the lining membrane in the kidney. It does not follow that there must be serious damage to the kidney structure because there is a little albumen in the urine. It should not be forgotten that the urinary tubes are probably crowded with crystals of uric acid and urates, and these may do temporary damage, leading to the escape of a little albumen, or even in some cases what seems to be a great deal, and yet the kidney tissues will perfectly recover. The following are the typical epithelial cells:—



EPITHELIAL CELLS (RENAL).—Oval and scutiform, from the pelvis or infundibulum of the kidney. Their presence indicates either exudative inflammation or exfoliation, or mechanical injury of the kidney by gravel or calculus.

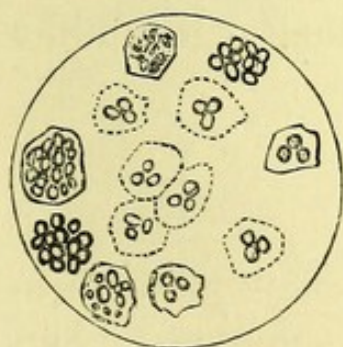


RENAL EPITHELIAL CELLS.—In this sketch the form of the cells may be accepted as typically renal. The particular cluster of cells shown probably occupied a tube, and escaped without separating.



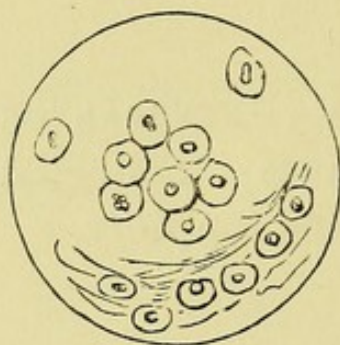
EPITHELIAL CELLS (URETHRAL OR VAGINAL). — Squamous epithelial cells. One seen at the top *fatty*.

Note particularly the probability of finding albumen from exudatory discharges from the vagina, and epithelial cells of strange form, in the urine of females. Mistakes are, I am inclined to think, often made in the examination of the urine of women, and they are supposed to have kidney disease, when the albumen found is from the source just named. In some instances the irregular character of epithelial cells from the vagina and the ureters has led to a suspicion of malignant disease without the least foundation in fact. Misconceptions also arise in connection with the loose cells found in most specimens of urine from gouty patients. Thus :—



COMPOUND GRANULAR CORPUSCLES, GRANULE CELLS, AND PUS CELLS.— These granule cells vary greatly in size and shape and character, some being loaded with fat-granules, while others are less full. Occasionally no cell-walls are visible, and the adherent fat-granules resemble blackberries.

Granule-cells, in quantity, imply low vitality. The tri-nuclear cells are pus corpuscles.



MUCOUS CORPUSCLES.—Mono-nuclear mucous cells, some free, some entangled in mucus. To the left of the central group a cell with compound nuclei is possibly a pus cell.

While the practitioner is pursuing this investigation suggested by the presence of albumen in the urine, he should note carefully any crystals that may be found. The principal crystalline deposits may be outlined, with a view to their ready recognition, as follows:—

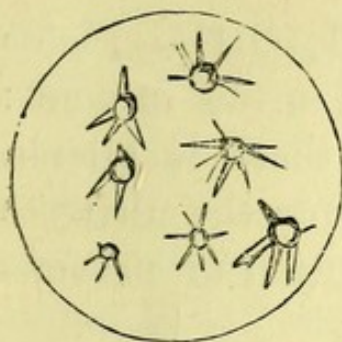


URIC ACID ($C_5H_4N_4O_3$) represents 33.33 per cent. of nitrogen. It crystallizes in from 7,000 to 8,000 times its volume of fluid. The average normal secretion per day in man is from 6 to 9 grs. Crystals stellar, lozenge, quadratic, barrel, columnar.

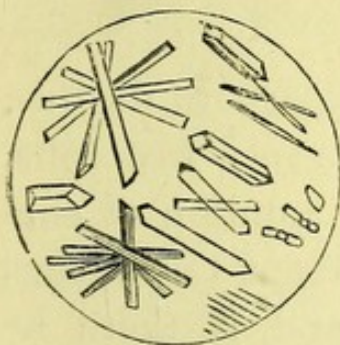
The globo-stellar are uric acid combined with ammonium urate. (See pages 5-7, Part I.)



SODIUM URATE.—This is the form in which uric acid commonly exists and accumulates in the blood, and in which it is deposited, in gout.



AMMONIUM URATE, SPIKED GLOBULES.—These occur in alkaline urine with phosphates.



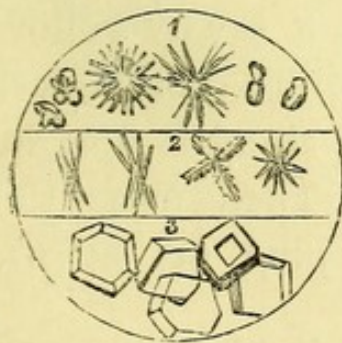
HIPPURIC ACID ($C_9H_9NO_3$) represents 7.82 per cent. of nitrogen. The average daily excretion in man is 7.5 grs., which is equivalent to 8.7 grs. of hippurate of soda. (See page 9, Part I.)



AMMONIO-MAGNESIUM PHOSPHATES, in feathery or right rhombic crystals, and CALCIUM PHOSPHATES, acicular crossed and twisted or in ropes or rosettes.—Found in alkaline urine.

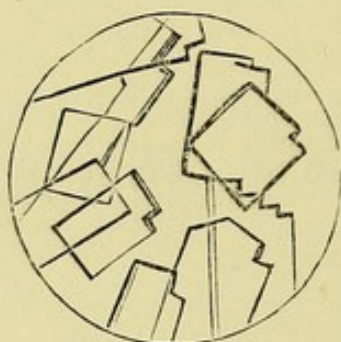


CALCIUM OXALATE. — Envelope-shape, octohedral crystals, highly refractive; some dumb-bells and sedimentary particles. Found in neutral or slightly alkaline urine.



1. Leucin. $C_6H_{10}(NH_2)O.OH$.
2. Tyrosin. $C_9H_{11}NO_3$.
3. Cystin. $C_3H_7NSO_2$ or perhaps $C_3H_5NSO_2$.

(See pages 11, 59, Part I.)



CHOLESTERIN, $C_{26}H_{43}(OH)$.—Plates *occasionally* found in urine in gout: probably only when there is bile in the urine. It represents the ultimate product of disassimilation of nervous tissue.

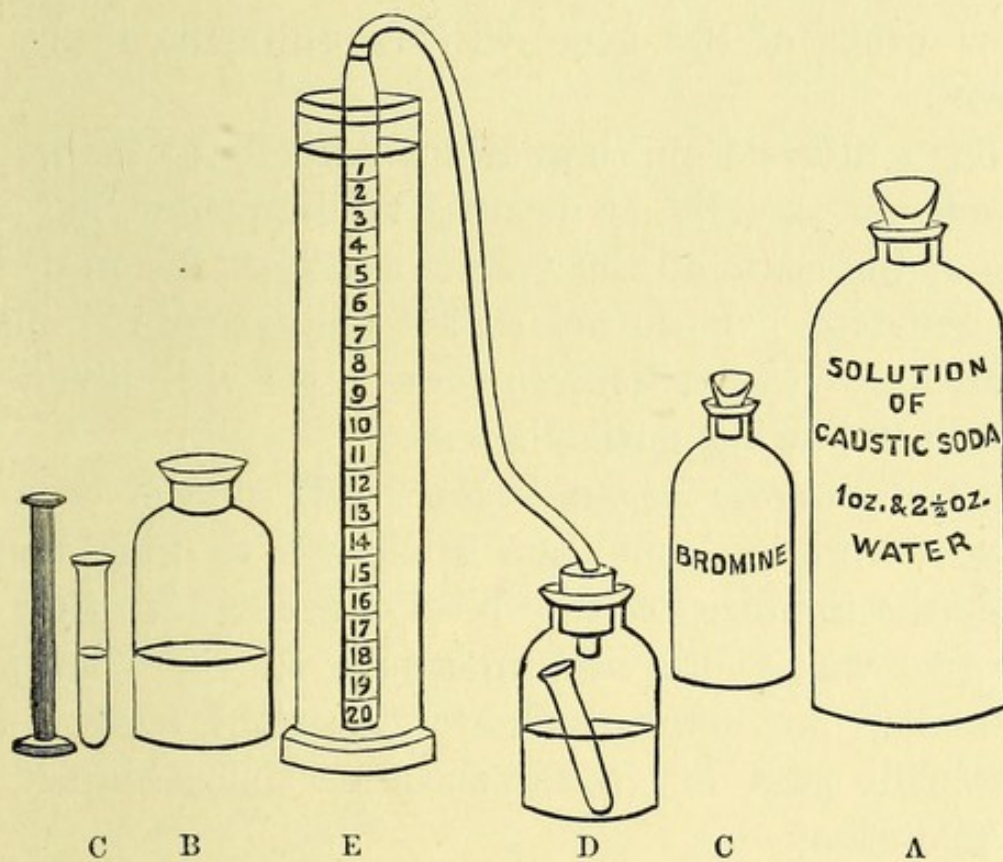
The urine may now be tested for sugar: to do this, pour about an inch and a half of urine in a test tube, add half a dozen drops of a saturated solution of sulphate of copper, and then fill up to about two inches in height with liquor potassæ; boil, and, if there be sugar, the blue cloud of hydrated oxide of copper will be converted into a yellow suboxide. If there be no sugar, prolonged boiling will produce a dark oxide of copper. Or Dr. Oliver's indigo-carminc sugar test paper may be used. There is seldom sugar in the urine in gout, but the test for it should on no account be omitted.

Next estimate the urea with the hypobromite test, which is sufficiently accurate. On the opposite page is a sketch of the apparatus.*

The solution in bottle A is caustic soda 1 oz. to $2\frac{1}{2}$ oz. of distilled water. Pour from A into B to the level of the mark ——. Bottle C contains pure bromine. Measure 40 mins. of this, and add to the soda just poured into B, then shake gently until a tawny yellow fluid is formed. Now pour urine into the little test tube C exactly to the mark ———, and stand it upright in the hypobromite solution in B. Then close the mouth of B with the indiarubber plug (as at D).

* To be obtained of Messrs. Motherwell, Glasgow.

Observe the level of the water in the tube E, and carefully incline the bottle D until the urine flows out of the tube within it, and mixes with the hypobromite solution. The nitrogen evolved will pass over and depress the level of the water in E, and each numbered division on that tube will represent the equivalent in nitrogen gas of a grain of urea per oz. of the urine examined.



Nothing can well exceed the simplicity of the process ; and the ease with which the analysis may be performed, even while talking to a patient in the consulting-room, makes the apparatus invaluable. For example, if the water-level in E fall from, say, 2 to 10, there will be urea in the urine equal to 8 grs. per oz., which, according to Parkes, is the normal proportion in healthy men, the

standard being $3\frac{1}{2}$ grs. for each lb. of the body-weight of the patient per diem, or about 450 grs. in all. My own experience goes to show that in gouty cases there should be a proportional quantity of not less than 10 or 12 grs. per oz. of the urine passed in twenty-four hours. The quantity estimated at each examination should be noted, together with the general characteristics of the urine as regards uric acid, as ascertained by microscopical examination of a few drops of the urine with its sediment, if any be present.

Great interest and importance attach to the pulse in gout, not merely as regards its frequency, but the state of the coats of the vessels and the tension of the blood-current. I use the pocket sphygmograph, made by Messrs. Weiss & Sons, in these cases, with a view to note the following particulars:—

Is the up-stroke perpendicular? If so, the coats of the vessel are in a condition to allow it to dilate freely under the impulse of the blood-current. If they do not give way readily, the up-stroke will not be perpendicular, but inclined towards the right, because the paper will pass on in the space of time occupied by the dilatation.

Does the down-stroke commence instantly? If so, the tracing will form an acute angle at the top, showing that the coat of the vessel is so elastic as to recover itself, and begins to contract the moment the impulse of the blood-current produced by the heart's contraction is complete. If the coat of the vessel have lost its elasticity or there be undue tension or pressure caused by resistance somewhere further on in the circulation

—perhaps in the kidney—there will be delay, and the paper, moving on, will cause the top of the tracing to be flat or to descend slowly. The down-stroke, which marks the recovery of the calibre of the vessel by its elasticity after the subsidence of the cardiac systole, always slopes instead of coming down perpendicularly, because the contraction normally occupies more time than the dilatation.

Is the largest wave, or second rise, on the down-stroke of the tracing well marked, and yet not too strongly emphasized? This wave is produced by the contraction of the muscular coat of the artery, induced “reflexly” through the vaso-motor system in response to the impulse conveyed by the current of blood from the heart at each systole of the left ventricle. If it be not well marked, either there is too great tension or a spasm of the coat of the artery. If it be too strongly marked, then what is called a “dicrotic” (*δίκροτος*) pulse-tracing will be produced, with a great camel’s-hump, on the down-stroke; and there is a deficiency of tone in the vessel, probably because the vital powers are low. The practitioner will soon learn the value of the sphygmograph if he will only accustom himself to use it habitually instead of simply feeling the pulse. A sphygmogram in the Case-book for each visit to a case of gout will constitute a valuable register of indications for treatment. These tracings do not, when taken with the pocket sphygmograph, occupy more than a minute, and they give a permanent record of both the rate and the quality of the pulse.

The temperature in acute gout as taken in the axilla—the best place in the affection, for general pur-

poses—does not range as high as in acute rheumatism, but it often rises to 102° or 103° , sometimes a little higher. I take the local temperature of the part affected with the Surface-thermometer, which I introduced to the notice of the profession some eight years ago.* It answers the purpose well, and often shows a high temperature at the focus of the inflammation. The value of this examination consists in the possibility of keeping a register from visit to visit of the variations of the local disturbance: and, which is of great practical use, it enables the practitioner to forecast, and provide against, metastasis, by the recognition of *that fall in the local temperature*, which usually precedes any “change of place” in the morbid energy of gout. Upon the bases of the general facts ascertained as to the state of the patient at his first visit, and subsequently, the practitioner will shape his general plan of treatment and select his remedies. I will now set down in order the formulæ which have seemed to me to be the most useful.

The virtues of the meadow saffron (*Colchicum autumnale*) in gout have been extolled, decried, extolled again, and again distrusted and almost denied. Like every other remedy which has done good service in the war against disease, it has had to endure the wear and tear of excessive adulation and unreasonable detraction. There can be no question that it has great value, or it could not have survived the ordeal. I would ask the reader to bear in mind that its action is supposed to be, and has been regarded for the last half-century at least

* The *Lancet*, August 11, 1877. The instrument can be obtained of Messrs. Weiss, 62 Strand, London.

as being, "particularly directed to the duodenum and the excreting ducts of the liver, for the stools it produces are always bilious." This is how Paris described it in his "Pharmacologia" in 1832. I am especially interested to recall the fact because I believe that, apart from its activity as a cathartic, colchicum exerts a peculiar influence on the liver, and to this property of the drug may, perhaps, be ascribed the specific efficacy which it possesses in, at least some, cases of gout. Colchicum acts energetically in the presence of acids, and it has been advised on that account to moderate its action by combining it with alkalis. Magnesia is approved for the purpose, and may be added to the colchicum either as magnesia or as carbonate of magnesia; or the carbonate and sulphate may be combined. The wine is prepared from the corm, the tincture from the seeds. It does not appear to make any great difference to the result which preparation is employed, but the *vinum colchici* is, on the whole, the best known, although the tincture of the seeds was for some time considered less violent in its action than the wine of the corm. In one form or another, either as the *hermodactyllus* of the ancients or disguised under the veil of a private preparation, as "*eau médicinale de Husson*," "Wilson's tincture for gout," &c. &c., the meadow saffron has been *the* remedy for gout from the remotest to the most recent times. The following I have found convenient formulæ. In submitting these and other prescriptions, it must be understood that I do not for a moment lose sight of the great importance of dealing with each case individually. They are simply suggested for consideration.

- (1) R Vini colchici, ℥iv.
 Potassæ bicarbonatis, ℥ij.
 Aquæ menthæ viridis, ad ℥vj.—Miscæ.

Fiat mistura, cujus sumatur cochleare magnum tertia vel quarta quaque hora ex aqua;

or with magnesia —

- (2) R Vini colchici, ℥iv.
 Magnesiæ carbonatis, ℥ij.
 Aquæ cinnamomi, ℥vj.—Miscæ.
 ℥ss. quartis horis;

or with diuretics, which greatly help the action of the colchicum, and render it less depressing—

- (3) R Vini colchici, ℥iv.
 Potassæ acetatis, ℥iij.
 Tincturæ serpentariæ, ℥iiss.
 Decocti scoparii,
 Decocti senegæ, āā ad ℥xij.—Miscæ.
 ℥j. quartis horis.

I do not myself often prescribe colchicum, for the reasons stated at pages 45, 46, but prefer the iodine treatment described at pages 42, 43, thus:—

- (4) R Ammonii chloridi, ℥iv.
 Potassæ chloratis, ℥ij.
 Tincturæ iodi, ℥cxx.
 Glycerini, ℥iiss.
 Aquæ, ad ℥xij.—Miscæ.

Fiat mistura, cujus sumantur cochlearia duo magna quarta quaque hora ex aqua;

or if the inflammatory fever be sthenic, with a particularly strong pulse, give aconite (page 81):—

- (5) R Tincturæ aconiti (Pharm. Brit.), ℥xij.
 Ammoniæ phosphatis, ℥iss.
 Decocti scoparii, ℥xij.—Misce.
 ℥j. tertiis vel quartis horis ;

or in less sthenic cases, phosphate of ammonia (page 46):—

- (6) R Ammoniæ phosphatis, ℥ij.
 Acidi phosphorici diluti, ℥iv.
 Syrupi althææ, ℥j
 Aquæ, ad ℥vj.—Misce.
 ℥ss. tertiis horis ex cyatho aquæ ;

or the valerianate of soda with infusion of serpentary, which has a marked effect in gout. The value of serpentaria in this disease is not adequately appreciated (page 47):—

- (7) R Sodæ valerianatis, gr. xlviij.
 Infusi serpentariæ, ad ℥xij.—Misce.
 ℥j. quartis horis, vel ℥ss. secundis horis ;

or benzoic acid in the form of benzoate of sodium (page 51) with wild cherry bark, which is useful as a stomachic tonic and sedative:—

- (8) R Sodii benzoatis, ℥iv.
 Syrupi pruni virginianæ, ℥iss.
 Aquæ aurantii floris, ad ℥xij.—Misce.
 ℥j. tertiis vel quartis horis ;

or in the form of benzoate of ammonium—

- (9) R Ammoniæ benzoatis, ℥iij.
 Glycerini, ℥xij.
 Infusi serpentariæ, ad ℥xij.—Misce.
 ℥j. quarta vel sexta quaque hora ;

or, which is the same thing chemically, the hippurate of sodium. Benzoates and hippurates appear in the urine as hippurates :—

- (10) R Sodii hippuratis, ℥iij.
 Potassæ citratis, ℥iv.
 Syrupi limonis, ℥iiss.
 Aquæ aurantii floris, ad ℥xij.—Miscé.
 ℥j. quartis horis;

or rely on the alkaline (page 36) effect of full doses of citrate of potass, which is converted into the carbonate after absorption, and therefore does not neutralize the acid of the gastric secretion :—

- (11) R Potassæ citratis, ℥xij.
 Infusi serpentariæ, ℥xij.—Miscé.
 ℥j. quarta quaque hora.

If there be great pain, give conium with hyoscyamus, with diuretics (page 46) :—

- (12) R Succii conii, ℥vj.
 Succii hyoscyami, ℥vj.
 Succii scoparii, ℥xij.
 Potassæ acetatis, ℥vj.
 Glycerini, ℥iiss.
 Aquæ rosæ, ad ℥xij.—Miscé.
 ℥j. quartis horis.

If the total quantity of urine passed be small in spite of the diuretic tendency of these combinations, one of the following pills may be given twice or thrice daily without discontinuing the mixtures :—

- (13) R Ergotinæ, gr. ij.
 Asparagin, gr. j.
 Extracti conii, gr. ij.—Miscé.

Fiat pilula, nocte maneque vel ter die capienda.

- (14) ℞ Pulveris apocyni cannabini, gr. j.
Glycerini tragacanthæ, q.s.
Fiat pilula; una vel duæ nocte maneque.

If there be need of an aperient, phosphate of soda is useful (page 37):—

- (15) ℞ Sodæ phosphatis, ʒss.
Glycerini, ʒij.
Aquæ, ʒiss.—Miscæ.
Fiat haustus.

If the patient be sleepless, tannate of cannabin may be given in a draught:—

- (16) ℞ Cannabinis tannatis, gr. iv.
Spiritus ammoniæ aromatici, ʒj.
Aquæ, ad ʒiss.—Miscæ.
Fiat haustus, hora somni sumendus.

If there be gastric irritation or diarrhœa concurrently with the arthritis, coto bark will be helpful as an astringent. Apart from this action it is a valuable medicine in gout. See Synoptical Index to drugs at the end.

- (17) ℞ Tincturæ coto, ʒij.
Pulveris tragacanthæ compositi, ʒj.
Syrupi althææ, ʒiss.
Aquæ, ad ʒvj.—Miscæ.
ʒss. tertiis horis;

or for troublesome flatulency without other stomach or intestinal indications:—

- (18) ℞ Sodii sulphocarbollatis, ʒij.
Aquæ destillatæ, ʒvj.—Miscæ.

Fiat mistura, cujus capiat cochleare magnum semi hora ante, vel post, cibum ex cyatho aquæ.

Should there be a desire to apply some medicament to the part affected (see page 38), the following lotion of lithia may be used:—

(19) ℞ Lithiæ carbonatis, ℥ij.
Aquæ, ℥viiij.—Misce.
Fiat lotio.

General principles of treatment have been discussed at pages 33–53. Food and stimulants are again mentioned farther on (pages 198–202).

CHAPTER II.

TREATMENT IN THE INTERVALS BETWEEN
ATTACKS.

(See pages 57-62.)

THE gouty patient should in all cases remain under observation during the intervals between attacks. These are the periods of opportunity for the cure of his malady. By this I mean something more than the avoidance of attacks. Whether the kidney cells, or the liver cells, or the spleen, or some other element of the organism be at fault, it is, I believe, possible to act on these organs, through function, in such a manner that not merely will there be immunity from attacks of gout, but amendment of the physiological defect which is the cause of the malady. This is confessedly a bold statement to make. There is a widely spread impression that any such *cure* must be beyond the reach of art, because the cause is "organic." Whatever may be said in regard to the impracticability of remedying defects of structure which result from disease, generally, will not apply to this matter of the organic basis of gout, for it is beyond question a fact that patients who have inherited gout, and, which is more, developed it in their own persons, may, and do, so rid themselves of the very tendency to the disease that they cease to be gouty. I am not speaking of the sort of relief obtained by finding a *modus vivendi* with the disease in

the matter of diet. I regard that policy as unworthy of our art, and one to which the physician should never have recourse except in cases either extremely advanced or manifestly incurable. In the great majority of instances it is practicable to place the possibilities of healthy living on a fairly natural footing. This being the view I take, it will be obvious that I cannot lay stress on diet as it is the fashion to lay stress upon it.

If practitioners would only consider carefully the ascertained facts with regard to the effects of food in gout they would not, I am persuaded, persist in basing their treatment of the disease on dietary schemes and precautions. The most recent experiments and inquiries in this direction go to show that we have been wrong in respect to this matter. Thus as regards sugar, it is demonstrated that, whether we allow "sugar" or not, it must needs be taken, because starch forms not less than seventy per cent. of ordinary bread and the bulk of nearly all the vegetable foods; and starch is, as we know, changed into glucose sugar, almost immediately after it has been taken, by the action of the salivary and pancreatic secretions. So that it is *impossible* to exclude sugar even if we desire to do so. Meanwhile, that sugar has not the least effect in increasing uric acid has been clearly shown in the experiments made by Böcker, Bischoff, and Voit. Böcker even goes so far as to infer from his observations that the use of sugar actually reduces the quantity of uric acid produced. I can confirm this conclusion clinically, and have no doubt that cases of the gouty diathesis in which I have expressly recommended a free use of sugar—as a natural stimulant to the kidney cells—have been benefited

by its use. In any event it is manifest that no physiological ground exists for the interdiction of sugar in gout. Then as regards the alleged injurious effects of a liberal use of meat, that is at once, and ought to be for ever, disposed of by the fact in comparative physiology that the carnivora only produce uric acid in extremely small quantities; while they form urea in abundance; their urine being almost solid when treated with nitric acid (nitrate of urea). Unless, therefore, we are to fly in the face of all the evidence, and suppose that gout does not consist in the over-production, the non-destruction, or the re-absorption of uric acid and the consequent presence of that acid or sodium urate in the blood, it is idle to talk of flesh food as injurious in gout. Of course excess in nitrogenous food may produce an accumulation of urea in the organism; but the idea that it can produce uric acid, which we know to be the *materies morbi*—or at least the morbid product—in gout falls to the ground with the hypothesis that uric acid is imperfectly oxydized urea, or a disassimilative material in process of metamorphosis into urea, a hypothesis which must certainly be set aside as having no solid foundation in fact.

Again, that stimulants are not injurious in virtue of their containing alcohol is proved by the immunity from gout enjoyed by spirit-drinking peoples; as those of Scotland, Poland, and other countries. That the *imperfectly fermented* wines are injurious is evident; but the bad effects they produce are not due to the alcohol or the sugar they contain, for neither of these elements, as we have seen, is injurious in itself, but to the process of fermentation set up in

the stomach by the introduction of a material which is, as it were, charged with the potentiality of a destructive metabolism. I have for many years past held this view, and I have been much gratified to observe, in the lectures and papers on gout published somewhat recently, evidence that what I believe to be the facts about food and stimulants are beginning to be recognized. Even port wine, strange as it may seem to say so, is not merely innocuous, but decidedly beneficial, in gout if it has been kept long enough in the wood before bottling to insure the completeness of the process of fermentation. It is either the state of fermentation or the ferment that does the harm.

I would therefore most strongly advise the practitioner to refrain from any attempt to control his patient's diet. Let him simply insist on a varied diet; and moderation; by which I do not mean starving, or even denial of the appetite, but simply the avoidance of gluttony or excess—that is, taking more than the appetite demands. No one article of food, whether it be flesh or vegetable, should be used to the omission of others. The food should be all well cooked. Acid fruits are generally, and fresh fruits always, beneficial. It should never be forgotten that Linnæus actually cured himself of gout by eating freely of strawberries. He took this delicious fruit largely in one attack with success; and repeating the experiment through five successive annual attacks he was finally cured. Sour cherries have been used for the same purpose, and there is great probability that some of the older compounds of vegetable bitters, inclusive of the "Portland powder," owed their efficacy to the presence of vegetable acids. Stimu-

lants are almost always, I believe, necessary in cases of a gouty tendency, and during the intervals of the attacks I impose no restrictions except that all alcoholic beverages shall be taken with food, and that new, or imperfectly fermented, wines shall be avoided. Port which has been *long enough in the wood to be thoroughly matured before bottling* I regard as not only permissible, but to be recommended, particularly in the cases of those who are much subjected to mental worry, apt to become irritated or depressed, and who, with pallid skins, show a tendency to puffy swellings of the feet or hands; or who are subject to considerable losses of fluid by perspiration, catarrh, or watery evacuations. It is also useful in cases of generally low tone with weak digestion, flatulence, and frontal headache, or "dizziness"—the effect of anæmia, not hyperæmia, as too often supposed—either when the stomach is empty or when it is, as it were, labouring to digest food after meals. Another useful stimulant is "Benzoic Arrack," two table-spoonfuls of which may be taken in a tumbler of Kronenquelle water, or made into punch with lemon juice, three or four times daily. This is prepared by adding benzoic acid in the proportion of 4 grs. to the oz. of fine Jamaica rum which is afterwards flavoured with orange. Messrs. Basil Woodd, of New Bond Street, have revived this old-fashioned beverage at my suggestion. It is curious that at the very time when we are discussing the value of benzoic acid in the treatment of gout, and awakening to the perception of the fact that alcohol and sugar are not injurious, it should be remembered that the famous punch of Vauxhall in the days of our grandfathers was made with benzoic

acid and rum. Paris, in his "Pharmacologia" (1833), thus alludes to the fact in a note:—"MOCK ARRACK. The author of 'Apicius Redivivus' directs, for the purpose of making a mock arrack, that two scruples of benzoic acid be added to a quart of rum. By a receipt of this kind the celebrated punch, of Vauxhall, is prepared." The formula was Dr. Kitchener's, I believe. I have increased the proportion of benzoic acid for medicinal purposes.

The clothing of gouty patients ought to be moderately, but only moderately, "warm." Of course there is no heat in the clothes. They should also be porous, and not of a kind to encourage perspiration. No gouty or rheumatic person should ever wear a "waterproof." The best results are, in my experience, secured by checking determination to the skin and compelling the kidney to do its work as *the* eliminating organ. I am not now speaking of cases in which there are unmistakable evidences of kidney disease; such cases must be treated on general principles, though, even in respect to these, too much concern for the disease is undesirable. A weakly organ will always fall out of work prematurely if it be allowed to do so. In ordinary cases, however, the skin should be kept moderately cool, being daily stimulated by the use of a flesh brush after a tepid bath. I do not think absolutely cold baths are desirable in gout. They depress the nervous centres too greatly and very often reaction is long delayed. Nothing tight ought to be worn round the extremities; garters and strings, tight boots and tight stockings—evils too often disregarded—should be avoided. There ought to be no pressure anywhere to retard the rapid flow of blood through the

veins. It is always on the venous side stagnation and deposit occur in gout.

Muscular exercise should be enjoined to an extent sufficient to maintain a healthy systemic or molecular need for food, and a normal metabolism. Walking with an object, not "doing a constitutional," should be a daily practice. It is not wise to push walking to exhaustion, but enough to make a man a little tired is desirable. Horse exercise is most useful. Next to horse exercise comes yachting in average weather at sea, or on the coast. Shooting with dogs—not cover-slaughtering—deer-stalking, and fly-fishing are to be recommended to all who can take such healthful exercises. It is a point of great moment to press the gouty to *work*, and it is just as well to work at some sport as to engage in ordinary labour. Indeed, sport has the advantage, if only the mind be interested without being worried.

For physic, give the iodine mixture (F. 4), as in the attack of acute gout (page 43), but only twice daily, or the iodine combined with nux vomica, thus:—

- (20) R Tincturæ nucis vomicæ, ℥℥x. (vel cxx.)
 Tincturæ iodi, ℥℥x. (vel cxx.)
 Glycerini, ℥xij.
 Aquæ, ad ℥vj.—Misce.
 ℥ss. ex aqua ter die;

or, if not too depressing, the iodide of potassium, though it is not equally efficient, may be substituted for the tincture—

- (21) R Potassii iodidi, gr. cxx.
 Tincturæ senegæ, ℥iss.
 Infusi sepentariæ, ad ℥xij.
 ℥j. quartis horis;

or tannic acid, which does good service by decomposing the urate of sodium—

- (22) R Acidi tannici, ℥j.
 Syrupi simplicis, ℥j.
 Aquæ, ad ℥vj.—Misce.
 ℥ss. hora ante cibum.

The taurocholate of soda (on the principle explained at pages 58, 59, 102) may be given alone—

- (23) R Sodæ taurocholatis, gr. iij.
 in pilula, una vel duæ ter die hora post cibum ;
 (See Synoptical Index of Drugs.)

or in conjunction with a mixture of lithia and benzoate of sodium, which I have found extremely useful—

- (24) R Tincturæ sumbul, ℥iij.
 Glycerini, ℥iss.
 Aquæ rosæ, ℥x.
 Misce, et deinde adde paulatim—
 Lithiæ carbonatis, ℥j.
 Sodii benzoatis, ℥iv.
 Potassæ citratis, ℥vj.—Misce.

Fiat mistura, cujus sumantur cochlearia duo magna
 bis die hora ante cibum ;

or nux vomica may be combined with serpentary (pages 47, 53)—

- (25) R Tincturæ nucis vomicæ, ℥lx.
 Tincturæ serpentariæ, ℥xij.
 Infusi serpentariæ, ad ℥xij.—Misce.
 ℥j. ter die post cibum ;

or, if there be much mental or nerve irritability, with want of appetite, cannabis, a too commonly neglected

drug, may be employed. This is very useful as a stimulant to the appetite, and gives buoyancy to the spirits, while it tranquillizes—

- (26) R Tincturæ cannabis indicæ, ℥cxxx.
 Tincturæ lupuli, ℥vj.
 Tincturæ nucis vomicæ, ℥lx.
 Infusi gentianæ compositi, ad ℥xij.—Miscæ.
 ℥j. ter vel bis die ;

or the *red* cinchona, which acts quite differently from the yellow, may be used—

- (27) R Tincturæ cinchonæ rubræ, ℥xviiij.
 Tincturæ chirateæ, ℥xij.
 Potassæ citratis, ℥ij.
 Syrupi aurantii, ℥iss.
 Aquæ, ad ℥vj.—Miscæ.
 ℥ss. ter die ex aqua.

One or other of these vegetable tonics will help to keep the general system in order, and increase its tone. It is not, in my experience, well to give gouty patients the mineral acids, and they are seldom benefited—indeed, often made worse—by iron.

Local measures to promote the mobility of the joints, and to induce the absorption of deposits, should not be neglected. Hot fomentations with plain water or the liquor in which *Fucus* (bladder seaweed) has been infused are sufficient to prepare the surface for rubbing or percussion as described at pages 70, 71, when speaking of chronic gout. It has been recommended to apply thin slices of sponge, wet with a solution of carbonate of lithia 4 grs. to the oz. (see F. 19, page 196) to the inflamed or thickened and stiffened parts, covering the sponge with thin guttapercha. In some cases this may be of use.

CHAPTER III.

TREATMENT OF CHRONIC GOUT.

(See pages 63-73.)

THIS, as remarked at page 72, must mainly consist in fulfilling the indications presented in the individual case; and these generally very closely resemble the indications presented in the intervals between attacks of acute gout, or in the attacks themselves. As regards the mode of life and food of the patient, the observations already made at pages 189-203 will apply. Considerable stress must be laid on the promotion of the liver function, and measures for the treatment of local manifestations of the malady will require to be active. For physic, the taurocholate of soda pills (F. 23, and Synoptical Index of Drugs) may be employed. I am also inclined to attach great value to the sulphides in chronic gout. The waters of Harrogate are especially useful in this form of the malady (See the chapter "Baths and Waters" at the close.) It is, however, possible, when the objection offered on the score of taste is overcome, to give sulphides at home, regulating the dose and frequency of administration with due care, thus:—

- (28) ℞ Ammonii sulphidi, ℥ij.
 Aquæ menthæ viridis *destillatæ*, ʒj.—Misce.
 Fiat haustus, ter die sumendus ;

or the sulphide of ammonium may be dropped into distilled water at the time of taking it. If it be mixed previously, the *distilled* green mint-water must be employed as a vehicle, not the aq. menth. virid. made with essential oil, or the sulphide will be instantly decomposed, throwing down sulphur. Or sulphide of calcium may be given in the form of a pill—

- (29) ℞ Calcii sulphidi, gr. ss.
 Sacchari lactis, gr. ij.
 Glycerini tragacanthæ, q.s. ut fiat pilula.
 Ter die sumenda.

(It is recommended to coat these pills with an alcoholic or ethereal solution of sandarach.)

In most cases it is, in my experience, sufficient to give benzoic acid, thus :—

- (30) ℞ Acidi benzoici, gr. iv.
 Glycerini, ℥j.
 Fiat pilula, ter die sumenda,

with a mixture combining benzoate of sodium with serpentaria—

- (31) ℞ Sodii benzoatis, ℥ij.
 Tincturæ serpentariæ, ℥iiss.
 Infusi serpentariæ, ad ℥xij.—Misce.
 Fiat mistura; ℥j. ter die.

The hippurate of sodium may be given in cases in which the benzoate either fails or is not approved—

- (32) ℞ Sodii hippuratis, ℥iv.
 Glycerini, ℥iiss.
 Infusi serpentariæ, ad ℥xij.—Misce.
 ℥j. ter die ;

or acetate of potash with guaiacum may be used—

- (33) ℞ Potassæ acetatis, ℥j.
Tincturæ capsici, ℥j.
Misturæ guaiaci, ad ℥xij.—Misce.
℥j. ter die.

If there be a tendency to effusion, with puffy swellings about the joints, the following will be useful :—

- (34) ℞ Asparagin, gr. xij.
Lithii bromidi, gr. xxxvj.
Lithiæ carbonatis, gr. xxxvj.
Aquæ, ad ℥vj.—Misce.
℥ss. bis vel ter die;

or if the bromide of lithium should have a too sedative effect, it may be omitted from the above form. The following is a modification of the mixture without the bromide and with serpentary. This also is very effective—

- (35) ℞ Asparagin, gr. xvij.
Lithiæ carbonatis, gr. xxxvj.
Infusi serpentariæ, ℥xij.—Misce.
℥j. ter die.

In certain cases of chronic gout, with torpid, dry skins and stiff joints, Turkish baths are useful, but I am careful to place such patients under restriction in the use of the bath, and to give precise directions as follows :—

1. Go at first into one of the least heated rooms, with a temperature very little above blood-heat (or, say, not over 110° Fah.), and remain there until the surface of the body is moist and slightly reddened.

2. If the skin do not become warm and begin to grow red and moist in ten minutes, ask one of the shampooers to wash the body with warm water, and to rub it *briskly* and *lightly* with a soft towel. Then return to the apartment where the temperature is not much above 110° , and wait until perspiration is established.

3. When perspiration has fairly commenced, and the surface is moist from head to foot (*not before*), have a little cold water thrown on the feet and legs, and then go into a room of somewhat higher temperature, but do not on any account enter a part of the bath where the heat registered by the thermometer is more than 140° . This is very important.

4. Either lie down on a couch or sit while in the bath, and, if it be not disagreeable to do so, keep the eyes closed as much as possible.

5. Do not remain in any of the warm rooms longer than half an hour; nor so long if the ventilation be imperfect, or the atmosphere seem impure.

6. Ask the shampooer to "finish" with an affusion of gradually cooled water, not colder than is pleasant. Do not either take the plunge bath or receive the douche.

Very great benefit is derived from the use of the Fucus or kelp baths as they *will* prepare them at Worthing. At some places where these baths are professedly given, they are perfectly useless, the seaweed, which is seldom the *Fucus vesiculosus*, as it ought to be, being heated again and again until it is exhausted.

The chronic gout patient needs a stimulant. I

know nothing more likely to act well in his case than the "Benzoic Arrack" mentioned at pages 101-102. Horse exercise is invaluable for all who can contrive to use it *daily*. The bowels should be made to act regularly. If phosphate of soda in doses of ζ iv. does not suffice, the following pill may be given when necessary at night, being followed by a draught of the phosphate of soda, or a Seidlitz powder the next morning:—

(36) ℞ Iridin, gr. iv.
 Euonymin, gr. j.
 Extracti taraxaci, q.s. ut fiat pilula.
 p. r. n.

Or one of the aperient draughts, formulæ for which will be found at page 212, may be used as occasion arises. The general treatment ought to be as suggested for the "attack" or for the "interval," as the state of the patient renders expedient.

A not uncommon complication in chronic gout is inflammation of the veins (gouty phlebitis). This may be the result of phlebismus (Marshall Hall) from a varicose state of the vessels; or endophlebitis set up by the crowding of crystals of uric acid, formed in the blood when the circulation is mechanically retarded and the part is "chilled;" or it may be traumatic, the consequence of a kick or blow. The local treatment should consist in wrapping the extremity loosely in cotton wool, and keeping it raised (pages 174, 175). Meanwhile, F. 10, 12, p. 194; 47, p. 213; 48, p. 214; 51, p. 215; 66, p. 221, &c., may be tried; with one of the aperient draughts, p. 212, occasionally.

CHAPTER IV.

TREATMENT OF RHEUMATIC, OR "FLYING,"
GOUT.

(See pages 74-83.)

THIS malady, as I have tried to show, is either rheumatism in the gouty, or gout awakened by rheumatism. The principles of the treatment to be adopted have been laid down in chapter vi., Part I. The following combinations will be found applicable to the relief of certain states and conditions which have previously been discussed. The first point on which to insist is that the patient shall be laid in blankets, and that he shall be completely clothed in flannel, not with the view of promoting perspiration, but to ensure that whatever cutaneous exudation exists may not be checked. The rationale of the treatment in rheumatic, as in ordinary, gout must be to determine to the kidney; but in rheumatic gout there is so strong a tendency towards the surface of the body that special measures need to be taken for the avoidance of "chill."

Mild aperients, cooling, but not inducing a flow of fluid from the intestinal glands and membrane, which would tend to diminish the physical power of the blood to hold the sodium urate in solution, are often desirable at the outset. One of the following draughts may be selected:—

- (37) ℞ Sodæ phosphatis, ℥vj.
Syrupi aurantii, ℥ss.
Aquæ, ad ℥ij.

Misce fiat haustus statim sumendus;

or the phosphate of soda may be given in ℥iij. or ℥iv. doses in mutton-broth (page 37); or a combination of carbonate and sulphate of magnesia may be used—

- (38) ℞ Magnesiæ carbonatis, gr. xv.
Magnesiæ sulphatis, ℥ij.
Glycerini, ℥ij.
Syrupi simplicis, ad ℥iss.;

or

- (39) ℞ Potassæ tartratis acidæ, ℥iss.
Tincturæ sennæ, ℥j.
Syrupi zingiberis, ℥ij.
Aquæ, ad ℥iss.;

or

- (40) ℞ Olei ricini, ℥ss.
Ovi vitellum.
Glycerini, ℥iij.
Tere optime simul, et adde paulatim—
Aquæ rosæ, ad ℥ij.;

or

- (41) ℞ Sodæ tartaratae, ℥ij.
Syrupi sennæ, ℥ij.
Infusi sennæ, ad ℥iss.;

or

- (42) ℞ Sodæ carbonatis, ℥ss.
Potassæ tartratis acidæ, ℥iss.
Syrupi rosæ, ℥j.
Aquæ, ad ℥iss.;

or

- (43) ℞ Pulveris rhei, gr. x.
Potassæ sulphatis, ℥j.
Pulveris tragacanthæ compositi, ℥ss.
Aquæ cinnamomi, ad ℥iss.

Tamarind whey, made by boiling the pulp in milk, is useful both as a very mild laxative and as a cooling acid beverage, which may be taken freely if it do not purge.

For general purposes it is well to give one of the following mixtures. If the rheumatic element be strongly marked, and the perspiration profuse,

- (44) R Potassæ acetatis, ℥iij.
 Spiritus juniperi, ℥vj.
 Infusi serpentariæ, ℥xij.—Miscæ.

Fiat mistura, cujus sumantur cochlearia duo magna
 quarta quaque hora ;

or, to determine to the kidneys,

- (45) R Asparagin, gr. xij.
 Potassæ citratis, ℥xij.
 Aquæ menthæ viridis, ad ℥xij.—Miscæ.
 ℥j. sexta quaque hora.

If there be less than the usual amount of perspiration, and the patient seem to be suffering from the effects of "chill"—that is, cold without adequate reaction—prefer

- (46) R Potassæ nitratis, ℥j.
 Potassæ bicarbonatis, ℥iij.
 Spiritus ætheris nitrosi, ℥vj.
 Aquæ menthæ viridis, ad ℥vj.—Miscæ.
 ℥j. quartis horis ex cyatho aquæ.

If the gouty element preponderate,

- (47) R Sodii benzoatis, ℥vj.
 Potassæ citratis, ℥xij.
 Succu taraxaci, ℥iss.
 Decocti taraxaci, ad ℥xij.—Miscæ.
 ℥j. quartis horis ;

or more specifically,

- (48) R Potassæ citratis, ℥iv.
Lithiæ citratis, ℥j.
Mori succi, ℥iss.
Aquæ, ad ℥xij.
℥j. quartis horis.

Should the salicin treatment be desired, the following formula may prove useful:—

- (49) R Salicini, ℥ij.
Extracti glycyrrhizæ liquididi, ℥iss.
Spiritus juniperi, ℥iss.
Aquæ, ad ℥xij.—Misce.
℥j. secunda vel tertia vel quarta quaque hora.

Salicin is much to be preferred to salicylic acid, but if that acid be selected this will do—

- (50) R Sodii salicylatis, ℥ij.
Extracti glycyrrhizæ liquididi, ℥iss.
Aquæ rosæ, ad ℥vi.—Misce.
℥ss. tertiis horis ex cyatho aquæ.

The febrifuge properties of salicin were first recognized by M. Leroux, and M. Magendie is cited by Paris, in his "Pharmacologia," as having stated that he had seen "three doses of six grains each stop a fever."

A more promising drug, and one which has been, as I think, most unjustly neglected, is the trimethylamine prepared from herring brine and fish. The solution is uncertain in its activity, but as the hydrochlorate this remedy may be employed with confidence and advantage in cases of rheumatic gout in which the *rheumatic* element preponderates.

- (51) R Trimethylaminæ hydrochloratis, gr. xxxvj.
 Syrupi aurantii, ℥iiss.
 Aquæ menthæ piperitæ, ad ℥vj.—Misce.
 ℥ss. ter die post cibum.

“Rheumatoid arthritis,” so-called—which is the “nodosity” so admirably described by Haygarth and subsequently by Marshall Hall—is more closely related to gout than to rheumatism, although it has been stated to have no connection with either. It is, in fact, the deforming rheumatic gout of female members of gouty families (see page 20, sec. 7). It generally, but not always, attacks women after the menopause, I have now under observation several cases in which the sufferers are not much over thirty years of age. The characteristic symptoms are swellings around, or near, the joints, particularly those of the fingers, though it affects also the lower extremities; stiffness first, then immobility and progressive deformity. The skin is tense and often very glassy in appearance (not to be confounded with the “glossy skin” of gouty nerve disease: see page 150), and the veins are distended and tortuous. A great deal may be done for these cases by the combined use of the Fucus baths and percussion. The trimethylamine may be given in the form of a pill night and morning; thus—

- (52) R Trimethylaminæ hydrochloratis, gr. ij.
 Althææ, gr. ij.
 Glycerini tragacanthæ, q.s. ut fiat pilula.
 Nocte maneque sumenda.

CHAPTER V.

TREATMENT OF SUPPRESSED AND RETROCEDENT,
OR "MISPLACED," GOUT.

(See pages 84-91.)

THE broad lines of treatment indicated in cases of this class have been laid down in chapter vii., Part I. The endeavour must be to relieve the organ affected, by measures directed specifically to itself, rather than by efforts to reproduce the gout in the part from which it has receded, or to induce it at points which we are accustomed to regard as its more legitimate seats. The expression "misplaced" gout is scarcely defensible, but it may be accepted for the idea it represents—namely, that the malady is more mischievous when it attacks an internal organ than when it affects an extremity; which is doubtless true. The remedies employed and the measures adopted should be essentially stimulating and restorative; because it is probably in result of an atonic condition of the organism as a whole, and of the organ affected in particular (pages 88, 89), that the disease does not present itself in its ordinary character, but becomes located in an extremity whether by suppression or by retrocession.

Counter-irritation over the part affected should be made in such way as to excite it; not as a derivative of energy. Warm mustard poultices applied as nearly as may be to the region of the organ involved are desir-

able the instant the evidences of suppression or retrocession are perceived. It is better to mix the mustard with linseed meal than to apply it in an unqualified state, because the aim must be to keep up the counter-irritation as long as possible—in fact, until the internal congestion is fully relieved. Turpentine calefacients, made by sprinkling turpentine freely on dry flannels heated almost to scorching before an open fire, may be applied to the parts if poultices seem undesirable. These counter-irritants have the advantage of being almost instantaneously available, which is often a great consideration. I have seen relief procured with striking rapidity, in sudden gouty congestion of the liver, by enveloping the whole of the right side of the trunk from a little above the waist to the crest of the ilium, and from the median line in front to the spine, with *very hot* flannels sprinkled with turpentine in the manner described. The flannels were changed every twenty minutes, and the application continued for four or six hours. Another plan, though not so good, is to sponge or paint the surface of the skin over the region with aromatic spirits of ammonia or dilute acetic acid, and then apply the hot flannels. The object in any case must be to produce and maintain a high degree of hyperæmia and irritation in the skin; and the turpentine seems to be the least disturbing—in a sense it is even a soothing—application, while it is effective as a counter-stimulant. This done, the patient should be induced to take at once a warm and cordial potion, which ought to be both nutrient and stimulating. There is nothing better than a large cupful of gravy-soup, with a dessert-spoonful of rum or whisky

stirred in it. After this, one of the following mixtures should be administered persistently until relief is obtained; the skin, pulse, and general condition, not excepting the mental, showing tokens of improvement. Remember that the peril lies on the side of depression and atony. There is little or nothing to fear in the way of sthenic inflammation. The blood is not loaded with fibrin, as in rheumatic fever, but with sodium urate, which is only, or chiefly, harmful when it is effused or deposited.

If the stomach be affected by *retrocession*, apply a warm mustard and linseed meal poultice to the epigastrium, and hot-water bottles to the feet, and give

- (53) ℞ Olei terebinthinæ, ℥xx.
 Tincturæ opii, ℥xv.
 Mucilaginis acaciæ, ad ℥iss.—Miscé.
 Fiat haustus, statim sumendus.

Afterwards the patient may take—

- (54) ℞ Camphoræ, gr. xxiv.
 Pulveris tragacanthæ compositi, ℥iss.
 Tere simul, et deinde adde paulatim—
 Spiritus ætheris compositi, ℥vj.
 Potassæ carbonatis, ℥ij.
 Infusi calumbæ, ad ℥xij.—Miscé.

Fiat mistura, de qua sumantur cochlearia duo magna
 secunda vel tertia quaque hora;

or, better,

- (55) ℞ Moschi, ℥j.
 Pulveris tragacanthæ compositi, ℥ij.
 Tere simul, et deinde adde paulatim—
 Spiritus juniperi, ℥iss.
 Aquæ rosæ, ad ℥vj.—Miscé.

Fiat mistura, de qua sumatur cochleare magnum
 secundis horis;

OR

- (56) R Tincturæ castorei, ℥vj.
 Spiritus lavandulæ, ℥vj.
 Spiritus juniperi, ℥iiss.
 Aquæ cinnamomi, ad ℥xij.—Misce.
 ℥j. tertiis horis.

If the stomach be affected by *suppression*, the gastric symptoms being pain and weight and oppression, with tenderness on pressure, apply a small blister over the epigastrium for ten or fifteen minutes, and afterwards a linseed meal poultice, and give

- (57) R Sodii benzoatis, ℥vj.
 Spiritus ammoniæ foetidi, ℥vj.
 Spiritus myristicæ, ℥vj.
 Spiritus chloroformi, ℥ij.
 Infusi cusparii, ℥xij.—Misce.
 ℥j. tertiis horis ;

OR

- (58) R Sodii hippuratis, ℥iij.
 Tincturæ castorei, ℥vj.
 Tincturæ serpentariæ, ℥vj.
 Aquæ carui, ad ℥vj.—Misce.
 ℥ss. tertiis horis ex cyatho aquæ ;

OR

- (59) R Vini colchici, ℥ij.
 Potassæ acetatis, ℥ij.
 Aquæ camphoræ, ad ℥vj.—Misce.
 ℥ss. ex aqua secundis horis ;

OR

- (60) R Spiritus armoraciæ compositi, ℥vj.
 Glycerini, ℥vj.
 Sodæ phosphatis, ℥ij.
 Syrupi mori, ℥iiss.
 Aquæ, ad ℥vj.—Misce.
 ℥j. tertiis horis ;

or

- (61) R Bismuthi subnitrat̄is, ℥iss.
 Mucilaginis acaciæ, ℥xij.
 Spiritus lavandulæ, ℥vj.
 Tere simul, et adde—
 Misturæ amygdalæ, ad ℥xij.—Misce.
 ℥j. quarta quaque hora.

If there be, after a while, any indication of gout in an extremity, a flying blister applied for ten minutes to the seat of pain or redness and followed by a linseed meal poultice; or a mustard and linseed poultice applied continuously, will be advisable. As soon as the attack becomes more general, it may be treated on the principles laid down, and with the remedies suggested, in chapter i., Part II. (pages 190–196).

If the heart be affected by *retrocession* in the middle of an attack, as indicated by pain, or oppression, or intermission, or any abnormal sound, apply quickly a warm mustard and linseed meal poultice to the whole of the cardiac region, and renew it frequently until the attack is over. Although the heart is not so often, or so gravely, damaged in acute gout as in acute rheumatism, there can be no question that there is considerable peril in this localization of the disease while it lasts. Either of the following mixtures may be useful :—

- (62) R Potassæ nitratis, ℥iss.
 Potassæ bicarbonatis, ℥iij.
 Tincturæ convallariæ, ℥ij.
 Aquæ menthæ viridis, ad ℥xij.—Misce.
 ℥j. tertiis vel secundis horis;

or

- (63) ℞ Potassæ citratis, ℥iss.
 Tincturæ digitalis, ℥ij.
 Syrupi limonis, ℥j.
 Infusi chiratæ, ad ℥xij.—Misce.
 ℥j. tertiis horis ;

or

- (64) ℞ Potassæ acetatis, ℥iij.
 Vini colchici, ℥iij.
 Tincturæ serpentariæ, ℥xij.
 Infusi serpentariæ, ad ℥xij.—Misce.
 ℥j. quartis horis.

When the heart is affected by *suppression*, the cardiac symptoms being present at the outset of the attack, apply a small blister over the apex for ten or fifteen minutes, and afterwards a linseed meal poultice, which must be often renewed, and give one of the following mixtures. If any joint be attacked, blister and poultice that as directed above.

- (65) ℞ Sodii benzoatis, ℥iij.
 Spiritus juniperi, ℥vj.
 Infusi senegæ, ad ℥xij.—Misce.
 ℥j. tertiis horis ;

or

- (66) ℞ Vini colchici, ℥iij.
 Potassæ citratis, ℥iv.
 Tincturæ senegæ, ℥iij.
 Succu scopariæ, ℥iss.
 Infusi senegæ, ad ℥xij.—Misce.
 ℥j. quarta quaque hora ;

or

- (67) ℞ Sodæ valerianatis, gr. xlviij.
 Tincturæ convallariæ, ℥ij.
 Tincturæ serpentariæ, ℥xij.
 Infusi serpentariæ, ad ℥xij.—Misce.
 ℥j. quartis horis.

If the liver be affected either by *retrocession* or *suppression*, apply turpentine calefacients as described above (page 217), and give one of the following mixtures :—

- (68) R Sodii benzoatis, ℥iv.
 Mucilaginis acaciæ, ℥iiss.
 Potassæ tartratis acidæ, ℥iiss.
 Succus taraxaci, ℥xij.
 Decocti taraxaci, ad ℥xij.—Misce.
 ℥j. quartis horis ;

OR

- (69) R Vini colchici, ℥iij.
 Magnesiæ, ℥iij.
 Mucilaginis acaciæ, ℥iiss.
 Tincturæ hyoscyamus, ℥cxx.
 Infusi calumbæ, ad ℥xij.—Misce.
 ℥j. tertiis horis.

The aim of treatment directed to particular organs in suppressed or retrocedent gout is simply to relieve the local congestion by *exciting* the blood-vessels to contract. It is not, as a rule, expedient to irritate the congested organ by the exhibition of drugs which act upon it specifically. The general treatment for gout should be either maintained or as quickly as possible renewed.

CHAPTER VI.

TREATMENT OF IRREGULAR GOUT AND GOUT
OF SPECIAL ORGANS.*(See pages 92-125 and 126-151.)*

It will not be necessary to do more than give formulæ for use in irregular or localized gout—that is, gout in special organs. The principles of treatment have been discussed in the preceding chapters. Only in respect to certain affections of the eye, the ear, and the throat will there be something to add to what has been already observed on these subjects. The distinction originally drawn between “irregular gout” and “gout of special organs” has been maintained, under some form of expression, by all the more careful writers on this disease, and I have thought it well to recognize it for the sake of convenience; but the treatment must be the same for both forms of localized gout, and for therapeutic purposes nothing would be gained by further distinguishing them. The pages in Part I. to which reference is made in connection with each of the following topics should be read with the formulæ.

GOUTY OBESITY.

(Pages 94-96.)

(70) ℞ Sodæ taurocholatis, gr. iij.
Keratin, q.s. ut fiat pilula.

Capiat unam vel duas ter die semi hora post cibum;

or

- (71) R Extracti fuci vesiculosi, gr. iv.
 Althææ, q.s. ut fiat pilula.
 Sumat unam bis vel ter die.

GOUTY DYSPEPSIA.

(Pages 96-99.)

The taurocholate pill above described (F. 70) will do much to relieve the dyspepsia of gout by compensating the deficient action of the liver and supplying better bile. This treatment will also be aided by one of the following stomachic tonics:—

- (72) R Tincturæ nucis vomicæ, ℥cxxx.
 Tincturæ capsici, ℥j.
 Infusi cuspariæ, ad ℥vj.—Miscæ.
 ℥ss. ter die ante cibum ;

or

- (73) R Tincturæ cinchonæ rubræ,
 Tincturæ calumbæ,
 Syrupi zingiberis, singulorum ℥iiss.
 Infusi gentianæ compositi, ad ℥xij.—Miscæ.
 ℥j. ter die hora ante cibum ;

or

- (74) R Liquoris sodæ arseniatis, ℥lx.
 Tincturæ eucalyptici gummi, ℥iv.
 Syrupi pruni virginianæ, ℥iiss.
 Infusi calumbæ, ad ℥vj.—Miscæ.
 ℥ss. ter die post cibum ;

or

- (75) R Lithiæ carbonatis, ℥j.
 Sodii benzoatis, ℥iij.
 Infusi gentianæ compositi, ad ℥xij.—Miscæ.
 ℥j. bis die ;

OR

- (76) R Lithii bromidi, ℥j.
 Sodii hippuratis, ℥ij.
 Tincturæ serpentariæ, ℥iss.
 Infusi gentianæ compositi, ad ℥xij.—Miscce.
 ℥j. bis die;

OR

- (77) R Sodæ phosphatis, ℥iij.
 Sodii benzoatis, ℥ij.
 Tincturæ gentianæ, ℥vj.
 Syrupi aurantii, ℥iss.
 Infusi cuspariæ, ad ℥xij.—Miscce.

Fiat mistura, cujus sumantur cochlearia duo magna ter die.

GOUTY COSTIVENESS AND CONSTIPATION.

(Pages 99-102.)

Some years ago I ventured to offer the following suggestions for the treatment of habitual constipation:—

When there is a lax and torpid condition of the muscular coat of the alimentary canal, we get food retained in the stomach or intestines until it ferments, or sometimes “decomposes,” with the result of distension, pain mechanically induced, and either eructations or incarcerated flatus. I have recently seen a number of cases in which this last-mentioned trouble, *ambuloflatulentus et furiosus*, was so great, and at the same time so obscure, as to give rise to the impression that grave disease existed; whereas every anomalous symptom quickly disappeared as soon as the muscular tone of the intestine was restored, and the contents of the bowel commenced to pass naturally on their course. The essential fault is partial, in some instances almost complete, loss of the reflex contractility of the muscular coat, so that the

presence of ingesta at any part of the canal does not excite the intestine to contract and propel it onwards. It is worse than useless to employ ordinary aperients in such a condition as this; they only irritate, without strengthening, the nerves on the healthy activity of which everything depends. When, therefore, this is the form of "constipation" we have to treat, a prescription something like the following will, in the majority of instances, be successful:—

- (78) ℞ Sodæ valerianatis, gr. xxxvj.
 Tincturæ nucis vomicæ, ℥j.
 Tincturæ capsici, ℥xlviij.
 Syrupi aurantii, ℥iss.
 Aquæ, ad ℥vj.—Misce.

Fiat mistura, cujus sumatur cochleare magnum ex aqua ter die semihora ante cibum.

Another form of constipation, in which there is a deficiency of the glandular secretions generally, throughout the intestine, manifested by the peculiarly dry and earthy character of the dejecta when the bowels *do* act, may be treated with a mixture such as this—

- (79) ℞ Aluminis, ℥ij.
 Tincturæ quassiæ, ℥j.
 Infusi quassiæ, ℥vij.—Misce.
 ℥j. ter quotidie, post cibum.

A third form, which depends chiefly on interruption of the natural *habit* of periodic discharge; and often results from repeated failure to move the bowels in consequence of one or other of the two preceding forms of this trouble, may generally be relieved by directing an attempt to go to stool at a particular time daily, and by the use of the following draught, taken the first thing

after *rising* from bed—not on awaking—in the morning, as nearly as possible at the same hour. It will be observed that it is not an aperient in the ordinary sense of the term. It is, as a rule, neither necessary nor desirable to continue it for longer than a fortnight. In many instances, it will be found to re-establish the normal habit in a week or less.

- (80) ℞ Ammoniaë carbonatis, ʒj.
 Glycerini, ʒvj.
 Tincturæ valerianæ, ʒj.
 Aquæ camphoræ, ʒv.—Miscæ.

Fiat mistura, capiat partem sextam in modo dictu.

Of course there have been many disappointments to record in practice based on the principle here laid down, but, on the whole, the successes have outnumbered the failures, and I am quite disposed to repeat the recommendation above made, with the qualification that, in cases of gouty costiveness or constipation, it is well to substitute infusion of serpentary for the water, in F. 78, and to increase the proportion of the sodæ valerian. thus—

- (81) ℞ Sodæ valerianatis, gr. xlviij.
 Tincturæ nucis vomicæ, ʒj.
 Tincturæ capsici, ℥xlviij.
 Infusi serpentariæ, ad ʒxij.—Miscæ.
 ʒj. ter die semihora ante cibum ;

or colchicum may replace the capsicum—

- (82) ℞ Sodæ valerianatis, gr. xlviij.
 Tincturæ nucis vomicæ, ʒj.
 Tincturæ colchici, ʒiij.
 Infusi serpentariæ, ad ʒxij.—Miscæ.
 ʒj. bis vel ter die ante cibum.

So with the alum mixture (F. 79) it may be adapted by the addition of benzoate of sodium and the substitution of serpentary for quassia, thus—

- (83) R Aluminis, ℥iij.
Sodii benzoatis, ℥ij.
Tincturæ serpentariæ, ℥j.
Infusi serpentariæ, ad ℥viiij.—Misce.
℥j. ter die post cibum.

The ammonia mixture (F. 80) may be varied as follows:—

- (84) R Ammonia carbonatis, ℥j.
Lithiæ carbonatis, ℥ss.
Sodii benzoatis, ℥iss.
Tincturæ valerianæ, ℥ix.
Aquæ camphoræ, ad ℥viiij.—Misce.
Partem sextam omni mane.

For inactivity of the bowels occurring habitually in persons who have the gouty constitution, the following formulæ are available:—

- (85) R Extracti cascaræ sagradæ fluidi, ℥iv.
Infusi serpentariæ, ad ℥viiij.—Misce.
℥j. nocte maneque;

or

- (86) R Vini colchici, ℥iv.
Sodæ phosphatis, ℥iij.
Tincturæ serpentariæ, ℥j.
Infusi serpentariæ, ad ℥viiij.—Misce.
℥j. bis die;

or

- (87) R Sodæ sulphatis, ℥ij.
Sodæ phosphatis, ℥ij.
Syrupi mori, ℥iss.
Infusi chiratæ, ad ℥viiij.—Misce. *
℥j. bis die;

or, if pills be preferred, the taurocholate of soda pills (formulæ 70, page 223); or

- (88) R Leptandrin, gr. iij.
Euonymin, gr. j.
Extracti hyoseyami, q.s. ut fiat pilula.
Omni nocte, vel p. r. n. ;

OR

- (89) R Iridin, gr. ij.
Extracti cascaræ sagradæ, gr. iij., in pil.
Tertiis diebus, vel p. r. n.

GOUTY HEADACHE AND NEURALGIA.

(Pages 103-106.)

Alternate hot and cold douches to the part affected. A blister applied for ten minutes at the seat of pain will often give relief in obstinate cases. For headache—

- (90) R Caffeinæ valerianatis, gr. xxiv.
Sodii benzoatis, ℥ij.
Aquæ, ad ℥vj.—Miscæ.

Fiat mistura, de qua sumantur cochleare magnum
sexta vel quarta quaque hora ;

OR

- (91) R Paraldehydi, ℥ij.
Sodii benzoatis, ℥ij.
Aquæ, ad ℥vj.—Miscæ.
℥ss. quarta vel sexta quaque hora ;

OR

- (92) R Tincturæ actææ, ℥vj.
Sodii benzoatis, ℥ij.
Glycerini, ℥iss.
Aquæ rosæ, ad ℥vj.—Miscæ.
℥ss. quartis vel sextis horis.

For maxillary, *not frontal*, neuralgia—

- (93) R Tincturæ gelsemii, ℥cxx.
Potassii iodidi, gr. lx.
Tincturæ scillæ, ℥iv.
Decocti scoparii, ad ℥xij.—Misce.

℥j. quarta vel sexta quaque hora ; donec dolor *mitescat* ;

or for neuralgia generally—

- (94) R Cannabin tannatis, gr. xlviij.
Sodii benzoatis, ℥iij.
Aquæ, ad ℥iij.—Misce.
℥ij. tertiis horis ; donec dolor exulaverit ;

or

- (95) R Vini colchici, ℥iij.
Potassæ acetatis, ℥vj.
Aceti scillæ, ℥iij.
Glycerini, ℥iss.
Aquæ, ad ℥vj.—Misce.
℥ss. quartis horis ;

or

- (96) R Lithii bromidi, gr. lx.
Tincturæ serpentariæ, ℥iss.
Infusi serpentariæ, ad ℥xij.—Misce.
℥j. sexta quaque hora ;

or

- (97) R Tincturæ veratri viridis, ℥lx.
Sodii benzoatis, ℥iij.
Aquæ, ad ℥vj.—Misce.

℥ss. ter die ; vel ubi dolor urget, *si vires sinunt* ;

(This should be watched carefully because it is too depressing in some cases, though seldom in so small a dose as ℥v. ;)

or in persistent cases—

- (98) R Asparagin, gr. xxiv.
Lithii bromidi, ℥lx.
Aquæ, ad ℥vj.—Misce.
℥ss. bis vel ter die ;

or very effective—

- (99) ℞ Tincturæ iodi, ℥cxx.
 Ammonii chloridi, ℥iv.
 Ammoniaë benzoatis, ℥ij.
 Glycerini, ℥iss.
 Aquæ, ad ℥vj.—Miscæ.
 ℥ss. *ex aqua tertiis horis vel ter die;*

OR

- (100) ℞ Vini colchici, ℥ij.
 Tincturæ castorei, ℥vj.
 Tincturæ serpentariæ, ℥iv.
 Spiritus ammoniaë foetidi, ℥iv.
 Aquæ menthæ piperitæ, ad ℥vj.—Miscæ.
 ℥ss. *tertiis vel quartis horis.*

GOUTY BRONCHITIS OR BRONCHIAL CATARRH.

(Pages 106-109.)

- (101) ℞ Tincturæ pulsatillæ, ℥lx.
 Tincturæ senegæ, ℥iss.
 Spiritus juniperi, ℥iss.
 Syrupi, ℥iss.
 Infusi senegæ, ad ℥xij.—Miscæ.
 ℥j. *quarta vel sexta quaque hora;*

OR

- (102) ℞ Tincturæ pulsatillæ, ℥lx.
 Tincturæ eucalyptici gummi, ℥iv.
 Spiritus juniperi, ℥vj.
 Syrupi pruni virginianæ, ℥iss.
 Infusi senegæ, ad ℥xij.—Miscæ.
 ℥j. *sexta quaque hora;*

OR

- (103) ℞ Vini colchici, ℥ij.
 Aceti scillæ, ℥iij.
 Mellis, ℥iv.
 Aquæ, ad ℥iij.—Miscæ.
 ℥ij. *pro tusse, secundis horis;*

or for spasmodic bronchial cough—

- (104) R Extracti grindeliæ fluidi, ℥ij.
Tincturæ senegæ, ℥iiss.
Syrupi althææ, ℥vj.
Aquæ menthæ piperitæ, ad ℥iij.—Miscæ.
℥ij. urgente tussi.

GOUTY ASTHMA.

(Pages 106-109.)

- (105) R Caffeinæ citratis, gr. xlvij.
Ætheris, ℥vj.
Potassæ citratis, ℥iv.
Sodii benzoatis, ℥iij.
Aquæ, ad ℥vj.—Miscæ.
℥ss. quartis horis vel ter die;

OR

- (106) R Coniæ hydrobromatis, gr. ij.
Aquæ destillatæ, ad ℥iiss.—Miscæ.

℥ij. sexta quaque hora (cautiously: see Syn. Index of Drugs);

OR

- (107) R Tincturæ cannabis indicæ, ℥ij.
Sodii benzoatis, ℥iij.
Tincturæ senegæ, ℥iiss.
Infusi serpentariæ, ad ℥xij.
℥j. quartis horis;

OR

- (108) R Vini colchici, ℥iij.
Sodæ valerianatis, gr. xlvij.
Tincturæ serpentariæ, ℥iiss.
Infusi senegæ, ad ℥xij.—Miscæ.
℥j. quarta quaque hora;

OR

- (109) R Colchicin, gr. $\frac{1}{32}$.
Glycerini tragacanthæ, q.s. ut fiat pilula.
Nocti et mane;

GOUTY SLEEPLESSNESS.

(Pages 109-125.)

Draughts for use in emergencies while treating for gout with other remedies :—

(110) ℞ Lithii bromidi, gr. vij.
 Asparagin, gr. iss.
 Succi scoparii, ℥iss.
 Aquæ, ad ℥iss.—Misce.
 Fiat haustus, hora somni sumendus ;

OR

(111) ℞ Extracti erythroxyli fluidi, ℥j.
 Syrupi pruni virginianæ, ℥j.
 Aquæ, ad ℥iss.—Misce.
 h. s. s. ;

OR

(112) ℞ Cannabin tannatis, gr. iv.
 Succi conii, ℥ss.
 Spiritus ammoniæ fœtidus, ℥j.
 Tincturæ serpentariæ, ℥j.
 Aquæ, ad ℥iss.—Misce.
 h. s. s. ;

OR

(113) ℞ Cannabin tannatis, gr. iv.
 Liquoris potasse, ℥xv.
 Aquæ, ℥j.—Misce.
 h. s. s. ;

OR

(114) ℞ Extracti piscidiæ erythrinæ fluidi, ℥ss.
 Sodii benzoatis, ℔j.
 Aquæ menthæ viridis, ad ℥iss.—Misce.
 Hora decubitus sumendus ;

OR

- (115) ℞ Paraldehydi, ℥xx.
 Syrupi scillæ, ℥ss.
 Aquæ menthæ viridis, ad ℥iiss.—Miscæ.
 Hora somni sumendus ;

OR

- (116) ℞ Codeiæ, gr. ss.
 Spiritus ammoniæ fœtidus, ℥ss.
 Syrupi scillæ, ℥xl.
 Aquæ camphoræ, ad ℥iiss.—Miscæ.
 h. s. s. ;

OR

- (117) ℞ Vini colchici, ℥xx.
 Sodii benzoatis, ℥j.
 Syrupi papaveris, ℥j.
 Aquæ, ad ℥iiss.—Miscæ.
 h. s. s. ;

OR

- (118) ℞ Tincturæ hyoscyami, ℥ss.
 Tincturæ castorei, ℥ss.
 Succii conii, ℥ss.
 Aquæ camphoræ, ad ℥iiss.—Miscæ.
 h. s. s.

Or in a pill—

- (119) ℞ Cannabin tannatis, gr. iv.
 Glycerini tragacanthæ, q.s. ut fiat pilula.
 Sumat unam hora ante dormiturus ;

OR

- (120) ℞ Lupulin, gr. iij.
 Glycerini et spiritus, q.s. ut fiat pilula.
 h. s. s. ;

OR

- (121) ℞ Narceiæ, gr. ss.
 Glycerini tragacanthæ, q.s. ut fiat pilula.
 Hora somni sumendus.

Or a powder in a spoonful of arrowroot—

- (122) R Pulveris ipecacuanhæ, gr. ij.
 Pulveris opii, gr. j.
 Potasse nitratis, gr. xvj.
 Fiat pulvis, hora somni capiendus.

GOUTY KIDNEY.

(Pages 132-138.)

In advanced cases of contracted granular kidney when—after a lengthened period, during which there has probably been a fairly large excretion of urine with very little albumen and few casts—the urine becomes scanty and the albumen considerable, or the granular casts are numerous, relief may be obtained by diminishing the blood-pressure. The effect is to enable the kidney to excrete a larger quantity of urine. The gouty deposit of sodium urate, in cases which find relief in this way, is doubtless extra-tubular, and the tubes are compressed. When, therefore, the blood-pressure can be reduced, the flow of urine through the tubes is rendered comparatively free. This mode of relief is the opposite of that described at pages 135-136 by flushing the tubes, which succeeds when the tubes are blocked with masses of urates, that may be dislodged and discharged by the lateral pressure produced by mechanically induced excretion, the result of increased blood-pressure. To reduce the blood-pressure very minute doses of nitro-glycerine (Rossbach) may be given.

- (123) Nitro-glycerine tablets, in each $\frac{1}{200}$ gr.

One to be taken every second or third hour until the quantity of the urine passed is augmented. The number of the tablets taken may be increased up to twelve or fifteen in the day;

or

- (124) R Liquoris nitroglycerini (1 p.c.), ℥xij.
 Aquæ, ad ʒvj.—Miscæ.
 ʒss. quartis horis si opus sit.

GOUTY ALBUMINURIA.

(Pages 166-167.)

- (125) R Fuchsine, gr. j.
 Glycerini tragacanthæ, q.s. ut fiat pilula.
 Nocti et mane.

In my experience, fuchsine has been most successful for albuminuria. Or

- (126) R Liquoris nitroglycerini (1 p.c.), ℥xij.
 Ætheris, ʒvj.
 Aquæ, ad ʒxij.—Miscæ.

Fiat mistura, de qua sumantur cochlearia duo magna ter die.

It reduces the tension, and thus removes *one* cause of the extravasation of the serum albumen. Or

- (127) R Acidi tannici, ʒiss.
 Infusi quassiaæ, ʒvj.—Miscæ.

Fiat mistura, ʒss. sexta quaque horis, hora post cibum.

The tannic acid is absorbed, and decomposes the urate of sodium. (See "Synoptical Index of Drugs.")

GOUTY OXALURIA.

(Pages 168-170)

Oxaluric acid ($C_3H_4N_2O_4$, formed by the breaking away of urea from an acid of the OH group) is probably the irritant. Iodine, by interrupting the morbid processes, most speedily rectifies the physiological error. (See F. 20, p. 203; 99, p. 231; 150, p. 249.)

GOUTY AFFECTIONS OF THE BRAIN, SPINAL CORD,
AND NERVES.*(Pages 138-146.)*

The various mental and nervous affections associated with gout must be treated on general principles. Thus:—

For the mental, see F. 91, 92, p. 229; 94, p. 230; 107, p. 232.

For the headache and neuralgia, see F. 90-100, pp. 229-231.

For those of which insomnia and cerebral excitement are symptoms, see F. 110-122, pp. 233-235.

Epileptiform troubles are aided by—

(128) R Sodii nitris, gr. xxiv.
Sodii hippuratis, gr. cxx.
Aquæ rosæ, ad ℥vj.—Miscæ.
℥ss. t. d. s. ;

OR

(129) R Ozonic ether, ℥vj.
Aquæ, ad ℥vj.—Miscæ.

Fiat mistura, de qua sumantur cochlearia magnum ter die.

See also Picrotoxin, "Synoptical Index of Drugs."

GOUTY AFFECTIONS OF THE EYE.

(Pages 146-148.)

Arthritic iritis, or arthritic ophthalmia, is a very formidable affection; and I am inclined to think it cannot be sufficiently well recognized, looking to the number of cases in which serious results—even complete loss of sight—have followed attacks, variously described as "iritis," "glaucoma," and the

like, which has manifestly been a genuine gouty inflammation. What is known as arthritic iritis is said to be "not common in patients who have gout." This is practically the same thing as saying that the irregular forms of gout do not usually co-exist with the regular, which is certainly in no way remarkable. The marvel would be if patients with formulated gout, or even a strongly marked podagraic constitution, did commonly suffer from arthritic iritis. It is therefore manifestly unreasonable to anticipate that the evidence of a gouty origin will be apparent on the surface of these cases of gouty ophthalmia. The typical discharge of urates at the close of the attack is often, but not always, detected, though it, I believe, invariably occurs. With this exception, however, there is not much to differentiate cases of this class from those of iritis of the ordinary type so far as the *general* conditions are concerned. Meanwhile, there are local peculiarities which, if not pathognomonic, are highly characteristic. Plus the zone of sclerotic hyperæmia, the change of colour in the iris itself, the partial opacity of the pupil caused by the presence of lymph in the fluid of the anterior chamber, the irregularity and immobility or impaired action of the iris, the obscurity of vision, the tension and pain, of ordinary iritis, the vessels of the conjunctiva will be seen to be especially turgid, and the veins of the globe peculiarly varicose. Instead of redness there will be a purple tinge of the eye, which generally extends to the lids. The notable points are the purple-blue tone of the whole organ and the varicosity of the veins, to which may be added—though it ought not, I venture to think, to be described as a

diagnostic sign—that around the cornea, where the arcus senilis appears in old age, or premature degeneration, there is frequently to be seen in these cases a blue-white line, which does not generally form a complete ring, but appears in the outer and inner arcs of the corneal margin. I do not attach great importance to this appearance. The varicose knots of the veins are perceptible in and through the conjunctivæ, for the vessels of the choroid are also affected; the unmistakable evidence of passive congestion on the venous side, and the tension and discoloration of the eye, are the chief characteristics. It is a misnomer to call this malady iritis; the iris is inflamed, but so are the other tissues of the eye, and the organ as a whole is in jeopardy from the outset. The pain is agonizing when tension sets in, but before that there is commonly a sensation of tingling, and weight, and numbness in the organ distinctly comparable to that which a gouty patient feels in the foot on waking when an “attack” commences. Indeed, arthritic iritis not uncommonly occurs suddenly in the night, like acute gout.

These cases are always urgent. The prudent general practitioner will at once call to his aid an expert ophthalmologist, for irreparable mischief may be done by the delay of proper treatment for even a few hours. Almost instantly on the occurrence of the ophthalmia there is an outpouring of fluid from between the closed or partially closed and quivering eyelids. This fluid is white and frothy. It is, in fact, loaded with uric acid or urate of sodium. The more copious the discharge the greater the determination of urates towards the ophthalmic region, and, although it might seem that the

escape of fluid would relieve the intra-globular vessels, the presence of the exudation is chiefly to be regarded as indication of the stress of the local congestion and the urgency of the need for relief. The prognosis is, of course, very unfavourable, and much depends on the promptness of the measures adopted.

Subject to the judgment of the specialist, I would suggest that fomentations to the eye in arthritic or gouty ophthalmia are useless and often aggravating. A layer of the softest absorbent wool, made to cover the eye very lightly, is the best local dressing. A blister behind the ear may be usefully applied, and for physic either the iodine mixture (F. 4, p. 192 ; 20, 21, p. 203), which I prefer to all others, or sulphide of ammonium (F. 28, p. 206). If these be not approved, then colchicum as a rapid febrifuge, thus—

(130) R Vini colchici, ℥iv.
Sodæ benzoatis, ℥iij.
Aquæ, ad ℥vj.—Misce.
℥ss. secundis vel tertiis horis ;

OR

(131) R Tincturæ aconiti (Pharm. Brit.), ℥xij.
Tincturæ iodi, ℥j.
Glycerini, ℥iss.
Aquæ menthæ viridis, ad ℥vj.—Misce.
℥ss. omni hora ;

OR

(132) R Tincturæ belladonnæ, ℥cxx.
Vini colchici, ℥iij.
Aquæ destillatæ, ad ℥iij.—Misce.
℥ij. quarta quaque hora vel ter die ex aqua ;

- (133) R Vini colchici, ℥iij.
 Potassii iodidi, ℥ss.
 Tincturæ scillæ, ℥iv.
 Aquæ camphoræ, ad ℥vj.—Miscæ.
 ℥j. bis terve in dies.

After the inflammation has been reduced a tonic should be given, as the aim must be to restore the tonicity of the vessels and to promote the re-absorption of effusions with the greatest practicable speed. The best tonic is, I think, red cinchona.

- (134) R Tincturæ cinchonæ rubræ, ℥xij.
 Sodii benzoatis, ℥ij.
 Syrupi aurantii, ℥iss.
 Aquæ, ad ℥vj.—Miscæ.
 ℥ss. quartis horis ;

or the salicylate of cinchonidine, if there be that tendency to perspiration and those flying pains which denote a rheumatic development of the gouty constitution (see pages 74, 75), thus—

- (135) R Cinchonidin salicylatis, gr. v.
 Glycerini tragacanthæ, q.s. ut fiat pilula ;
 secunda quaque hora sumenda.

For a collyrium, with which the eye may be bathed four or five times daily, or which may be applied with a soft compress hung loosely over the eye, so that heat may be obviated and evaporation may proceed freely, the following will be useful :—

- (136) R Infusi cinchonæ flavæ colatæ, ℥ij.
 Aquæ sambuci, ℥ij.—Miscæ.
 Fiat collyrium.

Such are a few general suggestions ; but the most

earnest of all must be to obtain at once the aid of a competent ophthalmologist, for of all the forms of gout, or of affections of the eye, there are few more gravely urgent than gouty ophthalmia; and it is all the more grave and urgent because "arthritic iritis," so-called, is too often diagnosed and treated as rheumatic, whereas it is gouty. At page 148 I have alluded to forms of gouty disease of the eye which are especially likely to elude the observation of the practitioner because the morbid processes on which they depend are slow, and their indications obscure. Either chronic sclerotitis, choroiditis, retinitis, or optic neuritis may be localized and specialized forms of irregular gout. The recognized symptoms of these maladies are not greatly changed by the fact of a gouty origin, but they are so far modified that they present a more atonic character, with greater venous congestion, more persistent tension, and an urgent tendency to the effusion of gouty material. They resist ordinary measures for their relief, while they give way to iodine and colchicum.

The system should be brought under the influence of iodine as rapidly as possible, topical applications being of the simplest character, lest blood charged with sodium urates or uric acid be determined to the part. Flying blisters behind the ears or to the temples are of great value. If iodine does not quickly mend matters, try the sulphides, or colchicum with benzoate of sodium, or colchicum with lithia, a collyrium of carbonate of lithia being used as an eye-wash, thus—

(137) R Lithiæ carbonatis, gr. iij.
Potassæ carbonatis, gr. v.
Aquæ sambuci, ʒiss.—Misce.
Fiat collyrium.

GOUTY AFFECTIONS OF THE EAR.

(Pages 148-149.)

When gout is localized in the organ of hearing, it may either take the form of an inflammatory invasion of the whole middle ear, having extended from the pharynx through the Eustachian tube, or it may be limited to the ossiculæ, or to the drum (*membrana tympani*). These several forms of the disease are sufficiently common, and easily diagnosed. When the *membrana tympani* is affected, the "chalky" deposit may often be recognized through the external layers of the membrane. In cases of middle-ear catarrh of gouty origin, there is generally, though not always, also follicular pharyngitis. If there should chance to have been perforation of the tympanum by some previous disease, an attack of gouty inflammation of the middle ear may be signalized by the discharge from the external meatus of a frothy fluid not unlike that which characterizes gouty ophthalmia.

There is not much to note of a special nature in these manifestations of gout; but I am anxious to mention an affection which may be deserving of more careful attention than I have been able to bestow on it. Gouty patients are not uncommonly a little deaf, and in nearly every case of the kind there is a history of super-auditory sensitiveness having preceded the deafness. May this not be due to gouty inflammation of the articulations between the stapes, incus, and malleus; at first by elongation intensifying the auditory transmission, and then by immobility causing the deafness?

I am led to make this suggestion by the fact that in several cases of distinctly gouty deafness which I have recently had an opportunity of studying somewhat closely, there has been full ability to hear sounds produced by a high number of vibrations of small amplitude (as determined by a Galton's whistle), while the drum was too rigid, or too much hampered by "ossification" of the articulations of the "ossiculæ" to receive and propagate the vibrations of larger amplitude which compose lower notes or tones. Persons so affected can hear a high musical note when they cannot either hear a low note or take in the sound-impression of the human voice in ordinary conversation.

The best treatment for these gouty ear cases is, I think, to get the system thoroughly under the influence of iodine, and to *fill* the external auditory meatus each night with a solution of lithia and sodium benzoate, keeping it in with a small stopper of finely compressed wool. The following formula will prove convenient :—

(138) ℞ Lithiæ carbonatis, gr. vj.
 Sodii benzoatis, gr. xij.
 Glycerini, ʒss.
 Aquæ, ad ʒj.—Misce,
 et instilla guttas auri hora decubitus.

I do not think the surgeon should lightly obtrude his drugs into the cavity of the tympanum; nor do I think he should carelessly inflate or drain it. I believe harm is often done by these modes of treatment; and that, even in the most expert hands, the Eustachian catheter, the Pollitzer bag, and similar appliances, are dangerous instruments. At one time I expected good results from nerve-vibration in deafness, and certainly I have

seen cases improved by it. Some of a number treated three or four years ago, have recently reported themselves as greatly benefited; the membrane of the tympanum having, as it would seem, recovered its mobility by mechanical vibration, and preserved it; but, on the other hand, I have seen many cases which have not gained anything by the treatment, and some in which, I fear, it may have done harm rather than good by too roughly shaking the drum of the ear, perhaps even dislocating the ossiculæ. On the whole, I am disposed to say that, while it may be tried in any case with a small disk held about an inch from the ear, there is nothing to be gained by perseverance in the treatment unless decided benefit ensues in the course of three or four successive applications. I am more hopeful of general medical treatment in these cases than of measures which are exclusively or mainly topical.

GOUTY AFFECTIONS OF THE THROAT.

(Page 149.)

These troubles are very common in gout, and may fairly be left to the throat-specialists so far as local treatment is concerned; for I am certain that, without practised dexterity in the use of the laryngoscope and the spray apparatus, only precious time will be wasted. The general medical treatment of these maladies, and particularly of a peculiar form of *dry throat* in which the natural mucous secretion seems to be arrested, should consist in the method which I have so repeatedly recommended—namely, to get the system under the influence

of iodine by one of the forms 4, or 20, or, if that should fail to mend the state of matters quickly, to administer a sulphide (F. 28, p. 206). There is a class of cases which I believe will nearly always be benefited by the Harrogate waters, if taken internally in suitable quantities, and at the same time skilfully applied as a spray or throat-wash to the upper part, as well as the back, of the pharynx, once or twice daily.

GOUTY AFFECTIONS OF THE SKIN.

(Pages 150-151.)

As a local remedy in gouty affections of the skin generally, the following lotion is useful—

(139) R Lithiæ carbonatis, gr. iv.
Aquæ, ℥j.—Misce fiat lotio.

In gouty psoriasis give internally—

(140) R Sulphuris iodidi, gr. xxiv.
Glycerini, ℥iij.—Misce.

Fiat mistura, de qua sumantur cochlearia duo minima ex aqua ter die post cibum ;

and apply thrice daily—

Unguentum sulphuris iododi ;

or

Unguentum acidi chrysophanic.
(x. grs. in 1 oz.)

In gouty eczema give internally—

(141) R Sodii iodidi, ℥ij.
Aquæ, ad ℥vj.—Misce.
℥ss. ter die.

and apply thrice daily—

Glycerinum iodi.
(20 grs. to 1 oz.)

or give internally—

- (142) ℞ Sodii salicylatis, ℥iij.
 Extracti glycyrrhizæ liquidi, ℥iiss.
 Aquæ, ad ℥vj.—Misce.
 ℥ss. ter die;

and apply thrice daily—

Unguentum acidi salicylici.
 (1 in 30.)

or with either of the above mixtures apply—

Unguentum olei cadini.
 (Very effective, if made with one part of oil of cade
 to four parts of vaseline.)

In the herpes occurring in gouty cases, give internally—

- (143) ℞ Sodii benzoatis, ℥iv.
 Sodii hippuratis, ℥ij.
 Infusi anthemidis, ad ℥xii.—Misce.
 ℥j. ter die.

and apply daily—

Glycerini acidi tannici.
 (1 to 4.)

If there be pain, apply three or four times daily—

Unguentum menthol.
 (1 menthol to 12 vaseline.)

In gouty urticaria give—

- (144) ℞ Potassæ citratis, ℥iv.
 Lithiæ carbonatis, ℥j.
 Lithii bromidi, gr. xxxvj.
 Aquæ aurantii, ℥vj.—Misce.
 ℥ss. ter die;

and apply a saturated solution of benzoic acid in eau de cologne frequently.

For application in affections of the surface when the skin is not broken, the following will be useful—

- (145) ℞ Morphia acetatis, gr. ij.
 Olei olivæ, ℥ij.
 Tere optime simul, et adde—
 Unguenti zinci, ℥j.
 Pulveris gallarum, ℥j.—M. Fiat unguentum.

GOUT AND SYPHILIS.

(Pages 162-165.)

Dress the chancre with :—

- (146) ℞ Unguenti hydrargyri, ℥j.
 Lithiæ carbonatis, ℥j.

and give

- (147) ℞ Pilulæ hydrargyri, gr. ij.
 Scillæ, gr. iiss.
 Colchicin, gr. $\frac{1}{32}$.—Misc.
 Fiat pilula, omni nocte et mane ;

or

- (148) ℞ Liquoris hydrargyri perchloridi, ℥vj.
 Ætheris, ℥iij.—Misc, et adde—
 Tincturæ iodi, ℥lx.
 Aquæ destillatæ, ad ℥vj. Fiat mistura.
 ℥j. bis vel ter die, donec afficiantur gingivæ.

Afterwards, or instead,

- (149) ℞ Ammonii iodidi, gr. ℥iiss. (or more).
 Spiritus juniperi, ℥iiss.
 Infusi buchu, ad ℥xij.—Misc.
 ℥j. t. d. s.

GOUT AND LEAD-POISONING.

(Pages 159-161.)

- (150) R Tincturæ iodi, ℥ij.
Sodii iodidi, ℥ij.
Tincturæ serpentariæ, ℥iss.
Infusi serpentariæ, ad ℥xij.—Misc.
℥j. quarta vel sexta quaque hora.

OR

- (151) R Potassæ acetatis, ℥vj.
Aceti scillæ, ℥vj.
Acidi acetici diluti, ℥iss.
Infusi serpentariæ, ad ℥xij.—Misc.
℥j. quartis vel sextis horis.

OR

- (152) R Potassæ acetatis, ℥vj.
Vini colchici, ℥iv.
Tincturæ serpentariæ, ℥xij.
Infusi senegæ, ad ℥xij.—Misc.
℥j. sextis horis.

GOUT IN WOMEN.

(Pages 152-155.)

See F. 5, 8, p. 193; 10, 13, p. 194; 20, p. 203;
24, p. 204; 27, p. 205; 35, p. 208; 74, p. 224;
76, p. 225; &c.

GOUT IN CHILDREN.

(Pages 156-158.)

F. 10, p. 194; 32, p. 207; 47, p. 213; 77, p. 225
(in doses reduced for age).

CHAPTER VII.

BATHS AND WATERS.

WHEN will the profession and the public begin to perceive the folly of going abroad in search of what can be found in as great, if not greater, perfection at home? I do not deny that there are gouty folk who live such lives of gluttony or indolence in this country, and so persistently reject or neglect the counsel of their medical advisers, that nothing remains except to send them away to places where it is *fashionable* to eat moderately, drink wisely, take a proper amount of exercise, and observe natural hours of rising and retiring to rest. For patients of this class, "Go to the baths" and "Take the waters" on the Continent may be useful recommendations. It is, however, simply nonsense to think and speak as though anything in the way of mineral waters for bathing and drinking purposes which can be found abroad may not also be found at home. We have in the United Kingdom some of the very best springs which exist, and I have not a particle of sympathy with those who would have us and the world believe that sufferers from gout need, or are even prudent, to take the trouble and run the risk of residence at the spas of Germany for the sake of a "cure." Very great harm has been, and is still being, done by the indiscriminate puffing of foreign watering-places. By all

means let English people who are able to do so travel both for pleasure and for health ; but, looking to the perils of fever and pestilence, with other nameless plagues, which must always abound in countries where sanitary precautions are at a discount ; to the discomfort of life in hotels ; and to the inconveniences of travel on the Continent, it would only be commonly wise to choose for the occasion of such an excursion a time and conditions of average non-susceptibility. In short, those who would travel abroad should do so when they are fairly well and strong, not when they are ill and weak.

Vichy, Karlsbad, Marienbad, Kissengen, Homburg, and the rest of the baths and springs abroad are not one whit better than Harrogate, Buxton, "The Bath," and other places in England, or Strathpeffer in Scotland. Unfortunately, the nation of shopkeepers is not sufficiently enterprising to make its own markets attractive. Our idea of free trade in this matter, as in most others, is to throw the resources of this country open to the world on the easiest of terms, while we do nothing whatever to promote or secure home interests. Harrogate, Buxton, Bath, Strathpeffer, and a number of other scarcely known places in this kingdom are fully as well adapted by Nature for "spas" as the places famed as such on the Continent ; but, except in a meagre, half-hearted way, we do not take advantage of the opportunities at our command to render the watering-places in our midst centres of fashion and entertainment.

The medical profession has much to answer for in this matter, and the sooner a recall to accuracy and common-sense is sounded the better. The great

authorities on baths and waters on the Continent do not themselves know precisely in what their virtue consists, or how to use them; still less are they agreed as to the method of "cure" generally advisable and best to be carried out. There is not among the medical writers of Germany—I mean the *clinical* physicians, as distinguished from the speculative pathologists—a more able and instructive teacher than Felix von Niemeyer. He knows, what far too few of us know, how to make the physiology of health the basis of a scientific endeavour to recover the sick from the toils of disease. This is how Niemeyer speaks of the baths and the waters of his own country in connection with gout:—
"The favourable effect of these mineral waters appears to depend on their reducing the plethora, due to a misproportion between supply and demand, in the body, whether the plethora depend solely on hypertrophy of the blood, *i.e.*, the increase of its cellular elements and a certain density of the intercellular substance (the serum of the blood), or on an accompanying absolute increase of the amount of blood contained in the body. It is very interesting to note that the beneficial influence of the natural mineral waters to plethora, which has been long known, and which far exceeds that of ordinary waters, agrees with the observations of C. Schmidt and Vogel, according to which the amount of albumen in the serum of the blood is inversely proportional to the amount of salt." I pause here to remark that the therapeutic argument from this fact must be two-edged. As albumen, and not salt, is the vital principle in blood, we ought

never to forget that the very moment the due proportional quantity of the albumen in the blood is reduced below a certain limit, there must be an impairment instead of an improvement of the health and vitality. With this by way of caution, we may proceed with the quotation from Niemeyer. "I am undecided as to which of the above springs [viz., Vichy, Karlsbad, Marienbad, Kissengen, Homburg, &c.] deserves the preference in the treatment of gout, whether the solution of salt of which the Kissengen and Homburg waters consist, removes the plethora more rapidly and completely than Karlsbad and Marienbad water, or the reverse. Nor shall I attempt to say whether the supply of those solutions of salt acts beneficially not only on the plethora, but also on that anomaly of the change of tissue which shows itself as the gouty (uric acid) diathesis in some plethoric persons. Nor can we, with our present knowledge, say whether in any particular case the preference should be given to Kissengen, Karlsbad, Wiesbaden, Homburg, or Vichy, and what would constitute the peculiarity of the case which indicates one rather than the other (!). It cannot be denied that in recent times the regular therapeutic employment of the so-called Bullrich's salt, a mixture of bicarbonate and sulphuret of soda, rivals the world-renowned success of these springs—a fact which is at least opposed to the asserted latent peculiarities and advantages of the natural solutions of salt." So much for Niemeyer's general opinion of the value and use of these waters for the relief of gout. Then comes an observation of great practical value. "Advantageous

as the above treatment proves in recent cases of regular gout if carefully and judiciously instituted, *there is often great harm done by excessive limitation of the supply of nourishment, by the sudden abstraction of spirituous liquors that had been used for years, as well as by all other debilitating courses of treatment which are employed carelessly or hastily.*" I have taken the liberty of printing these words in italics. They cannot be too strongly emphasized. "The patient is often freed from attacks of acute gout by this too zealous or too hasty treatment, but becomes affected instead with irregular, chronic, or atonic gout, an exchange by which he certainly gains nothing. As soon as gouty patients begin to show the signs of general cachexia, their disease is rendered worse by a continuation of this debilitating treatment," &c.

So far as "baths" and "waters" are necessary or likely to be useful in the treatment of gout, those of Harrogate, Buxton, Bath, Strathpeffer, and other home resorts, answer every purpose, and it only needs that these places should be made more attractive, by increased liberality on the part of their local authorities respectively, to revive the popularity of springs which have been forgotten and to illustrate the merits of those which have only recently begun to be appreciated. With a view to bring the armoury of weapons against this disease more fully before the profession I append analyses and short statements of the value of the British springs extracted from papers which have been kindly placed at my disposal by local practitioners to whom I have ventured to apply for special information; the inquiry being in each case suggested by the beneficial

results of a recourse to these waters in cases of gout under my observation.

HARROGATE.—The waters available for medicinal purposes at Harrogate are not only rich in all the remedial elements, but so well studied and interpreted by Dr. Oliver—to whose elaborate researches in, and ingenious applications of, chemical science the profession is deeply indebted for many valuable aids to practice—that nothing short of ignorance of their worth can explain the fact that physicians as a body make surprisingly little use of them. When we hear of gouty patients being told that “there are no waters in this country” suitable to their cases, and this on the very highest authority, the mind naturally wanders in the endeavour to discover the reason why. As a matter of fact, no member of the profession who gives himself the pleasure of reading Dr. Oliver’s little work on “The Harrogate Waters” can fail to be impressed with the idea that the shortest way of dealing with any troublesome case of the malady we are discussing must be to recommend the patient to visit Harrogate and place himself under local treatment.

It would be idle for me to attempt to epitomize, in the limited space at my disposal, the facts fully expounded by Dr. Oliver, nor would it be consistent with my purpose to do this if I could. My sole aim is to insist that within the limits of the United Kingdom—and, therefore, within reach of all our patients—there are spas as good as, if not better than, those on the Continent; and, with this fact staring us in the face, it is not justifiable to recommend, or, so far as we have

influence, to permit, the sick or barely convalescent to run the risks of travel abroad. As I said before, let them make excursions for pleasure when they have regained their health ; but, while they are weak and ill, with all the appliances of cure close to their own doors, they should neither be encouraged nor countenanced in the folly of taking a long and toilsome journey. The Harrogate waters are divisible into the sulphur and the iron groups, the former containing alkaline sulphides ; and the latter protosalts of iron. The proportion of sodium sulphide is very large, and it is combined with chloride, which greatly enhances its therapeutic value. There cannot, I think, be the slightest doubt that we are on the eve of a complete revolution in the method of treating gout. The very large number of communications I have had from practitioners approving my introduction of the iodine treatment, and endorsing, more or less warmly, the opinion I have expressed of its value, points to the twofold conclusion that a new method is felt to be necessary, and that this is to be found in the use of those agents which decompose the urates in the blood. Iodine, sulphur, and chlorine—in a lesser degree probably bromine also—act in this way. It is to me especially easy to understand the remarkable efficacy of the Harrogate sulphur—or *sulphide*—waters since I adopted what I may call the iodine method in acute gout and the sulphide method in acute rheumatism. The difficulty in giving sulphides in the form of artificially prepared medicines is very great. In the Harrogate waters we have the prescription dispensed by Nature, and the destructive

decomposition which throws down the sulphur in our mixtures, or renders the administration of sulphides in the form of a pill unsatisfactory, does not take place until the sulphided waters from this natural source have been taken into the stomach and, some portion at least, absorbed into the system, so that the blood and tissues can be gradually and efficiently acted upon by the sulphide with the chemical result of decomposing the sodium urate; on which our success so much—or, as I believe, entirely—depends. Dr. Oliver credits the sulphuretted hydrogen liberated from the sulphides with a “sedative action.” I can well believe that this is at least a collateral effect of the small proportion set free in the blood. The *sulphur* is of comparatively little value for the purposes of gout cure. It is the sulphide we want, and this we get ready to hand at Harrogate. I have nothing to say about the iron water. My experience of the salts of iron in gout is not of a nature to prompt me to recommend their use, but I will not presume to dogmatize on the subject. For the sulphides, I say, send your patients to Harrogate, and in so doing take care that they are well advised as to the use to be made in each individual case of the potent remedies which are there liberally dispensed.

BUXTON.—For the following comparative study of the Buxton and foreign waters I am indebted to Dr. W. H. Robertson, Consulting Physician to the Buxton Bath Charity and Devonshire Hospital:—

The most recent analysis of the thermal water of Buxton is by Dr. Thresh. The complete examination necessitated three series of analyses; the first, of the mud deposited near the

mouth of the spring; the second, of the gas issuing from the spring, and of the gas dissolved in the water; and the third, of the saline constituents.

“When the springs and reservoirs into which the water flows were examined, the slabs, walls, &c., were found to be coated with a very dark brown mud which stained the skin when rubbed between the finger and thumb. It appeared of a peculiar character, and it was felt that its analysis could not but yield interesting results. Such proved to be the case. It was found to consist chiefly of the highest oxides of manganese in a hydrated condition, and capable of combining with oxygen when exposed to the air, or to water containing oxygen in solution. In composition it corresponds closely with that of many samples of psilomelane and wad, ores of manganese. The importance of the inference to be drawn from this discovery will be discussed later on. Molybdenum has never before been discovered either in a mineral water or in a deposit from such a spring, but probably is derived from a molybdate of lead which may frequently be found in cavities of limestone rocks. The tabulated result of the analysis is appended:

Oxide of manganese	80.32
Sulphate of barium, sand, &c.	1.08
Lead oxide . . . . .	.15
Copper „ . . . . .	.07
Molybdic acid . . . . .	.02
Cobalt oxide . . . . .	.30
Iron and aluminium oxides	1.36
Zinc oxide . . . . .	.46
Barium oxide . . . . .	.79
Calcium „	5.31
Strontium „	a trace
Magnesium „	3.18
Carbon dioxide	3.23
Phosphoric acid . . . . .	.01
Water	3.93
	<hr/>
	100.21

“The results obtained by the analysis of the gas evolved at the spring were in close accordance with those of Dr. Playfair, but it was noted that the composition of this gas varied slightly, according to the length of time during which it was allowed to

remain in contact with the water under the reduced pressure to which it is subject when it has risen to the earth's surface. Thus the mean of two analyses of the gas collected at the mouth of the spring, and at once removed from contact with water, gave

Nitrogen	99'12
Carbonic acid	'88

whilst some of the gas which had been allowed to stand over a little water gave:—

Nitrogen	98'63
Carbonic acid	1'37

“ This difference would be inexplicable were Dr. Playfair's assumption correct. Undoubtedly at some little depth the free gas consists of pure nitrogen, whilst at a still greater depth even that will be in solution.

“ In determining the amount and composition of the gas held in solution by the water at the moment of issue from the springs, the greatest care was taken to obtain reliable and accurate results, and as an appendix to the original paper an illustrative description will be found of the apparatus used in collecting and measuring the gases. The mean of a number of experiments gave the following results:—

	Cubic inches per gallon of water.
Nitrogen	6'1
Carbonic acid gas	4'1
Total	10'2

From this the calculated percentage composition is—

Nitrogen	59'78
Carbonic acid gas	40'22
Total	100'

“ To dissolve 10'2 cubic inches of such a gaseous mixture at a temperature of 81'5 Fah. (that of the thermal water) would require a pressure of 1'64 atmospheres, consequently on exposing the freshly drawn water bubbles of free gas commence to make their appearance, and after a time the excess passes off, but this takes place if the water is not agitated, much more slowly than might be anticipated, considering the insoluble character of the gas.

In fact when the water is agitated, as in bathing, the surplus gas is liberated almost instantaneously, and in bubbles so minute that the water becomes opalescent. Doubtless much of the gas is liberated within the very pores of the skin during bathing, and acts in what may be considered its semi-nascent state, producing effects altogether unattainable by use of the same agent in any other condition.

“The analysis of the mineral constituents was conducted after the manner of Baron Bunsen, in his examination of the mineral springs of Baden-Baden. The process, though exceedingly tedious, leaves nothing to be desired as regards the accuracy of the results, and has the advantage over older methods in allowing these results to be so completely checked that there is little danger of overlooking any of the constituents. As was previously stated the whole of the elements present in the deposit were not found in the residue obtained by evaporation of large quantities of the water, but this was doubtless owing to their almost entire insolubility, and to our ignorance of reactions sufficiently delicate to detect such minute quantities. Calculated into grains per gallon the water was estimated to contain—

Bicarbonate of calcium	14.01
„ magnesium	6.02
„ iron . . . . .	.03
„ manganese . . . . .	.03
Sulphate of barium . . . . .	.05
„ calcium . . . . .	.26
„ potassium . . . . .	.62
„ sodium . . . . .	.84
Nitrate of sodium . . . . .	.03
Chloride of calcium . . . . .	.02
„ sodium	3.10
„ ammonium	trace
„ magnesium . . . . .	.95
Silicic acid . . . . .	.95
Organic matter . . . . .	.02
Carbon dioxide . . . . .	.20
Nitrogen . . . . .	.19
	27.32

Lithium, strontium, lead, and phosphoric acid, traces.

“ On account of the special organic purity of the water, the comparatively small quantity of the saline constituents, and the large volume of nitrogen contained in it, the Buxton spring is usually classed with those of Gastein and Wildbad. It differs from these, however, in containing in solution a much larger proportion of nitrogen, whilst the gases evolved from the waters of its congeners contain very considerable proportions of oxygen (Gastein), or of oxygen and carbonic acid (Wildbad).

The springs at Gastein, in Austria, are 3,051 feet above the sea-level, and the waters have a temperature varying from 95° to 118° Fah. It is evident, therefore, on account of this higher temperature, that, upon coming to the surface, these waters must lose their gaseous elements much more rapidly than the Buxton waters, for the solubility of all gases diminishes with increase of temperature. The evolved gas consists of

Nitrogen	69·1 per cent.
Oxygen	30·9 ”
Carbonic acid	— ”

and each gallon of water contains—

Bicarbonate of calcium	5·1 grains
” magnesium	’3 ”
” iron	’7 ”
” sodium	’6 ”
” manganese	’3 ”
Sulphate of sodium	15·1 ”
” potassium	’1 ”
Chloride of sodium	3·6 ”
Phosphate of aluminium	’4 ”
Silica	2·4 ”
Fluorine, strontium, and organic matter .	traces
Total	28·6

“ On account of the difference in the solubility of oxygen and nitrogen, and of the proportion in which they exist in the atmosphere, water, when agitated with air, takes up, for every 65 volumes of nitrogen, 85 volumes of oxygen, and therefore is richer in oxygen relatively to nitrogen than the atmosphere. Now the Gastein waters evolve a gas differing from common air only in being somewhat richer in oxygen, and therefore the gas

held in solution must contain a still larger proportion of the latter element. By calculation based upon the analytical data just given, the dissolved gas will consist of

Nitrogen	52.5 per cent.
Oxygen	47.5 "

And assuming the water as it issues from the earth to remain as highly surcharged with gas as does that of the Buxton thermal spring, it would only contain per gallon—

Nitrogen	4.0 cubic inches
Oxygen	3.6 "

or less than two-thirds the amount contained in the Buxton water. Supposing this water to have derived its nitrogen from the atmosphere, it must have passed in its subterranean course through very different strata to those traversed by the waters of the Buxton thermal spring, since, instead of losing oxygen, it has actually become more highly charged with this gas.

“The Wildbad (Württemberg) springs, about fifty in number, arise at an elevation of 1,300 feet, have a temperature of 96° Fah., and are found very beneficial in cases of chronic rheumatism and gout. They contain more nitrogen than the Gastein springs, and are in other respects more allied to those of Buxton. Each gallon has been found to contain—

Sodium chloride	8.2 (?) grains
„ bicarbonate	8.5 "
„ sulphate	4.0 "
Potassium sulphate	2.0 "
Calcium bicarbonate	4.9 "
Magnesium	10.6 "
Manganese and iron	4.0 "
Silica	3.9 "
Total	46.1

The gas evolved consists of—

Nitrogen	79.25 per cent.
Oxygen	8.25 "
Carbonic acid	12.5 "

From which it is evident that, like the Buxton water, it has lost oxygen and taken up carbonic acid; but, unlike it, it has not parted with the whole of the former element. The composition of the gas held in solution will be—

Nitrogen	9.4 per cent.
Oxygen	2.0 „
Carbonic acid	88.6 „

And assuming these warmer waters capable of remaining as surcharged with gas as do the Buxton waters, they would only contain in each gallon 4.7 cubic inches of nitrogen, or a little over two-thirds of the amount found in the Buxton springs. Moreover, this would be highly diluted with carbonic acid, as one gallon of water would contain—

Nitrogen	4.7 cubic inches
Oxygen	1.0 „
Carbonic acid gas	44.3 „

“In its richness in nitrogen, therefore, the Buxton water stands pre-eminent.”

Upon this report, Dr. Robertson remarks as follows:—

Much merit is due to Dr. Thresh for this very comprehensive series of analyses. The examination of the deposit from the water gives results of much interest, whether it be held to solve the problem of the origin of the nitrogen in the water or not. By every chemist who has examined the gases with which the Buxton thermal water is charged, it is placed at the head of all mineral waters that are so constituted, and is shown to be surcharged with nitrogen, whatever medicinal value may attach to such constitution. Even the well-known mineral waters of Gastein and Wildbad, remarkable as these waters are known to be for their medicinal character, contain less of nitrogen gas than is evolved by the Buxton mineral water, as demonstrated by Dr. Thresh's calculations.

The waters are singularly clear and brilliant, and faintly tinged with a blue colour. They are vapid and somewhat cal-

careous to the taste. They are what is called *soft* to the touch. They have a remarkably deterrent and emollient effect on the skin. This is partly due to their calcareous and alkaline character, but may be partly referable to glairine, which is said to be present in many mineral waters, of similar composition, and to communicate to them this emollient effect upon the skin. Whatever the cause, or causes, this effect is well known and very agreeable. Their temperature, remarkable buoyancy, softness, and clearness, and freedom from smell, or marked taste, render their use as a bath very pleasant; giving, at the instant of immersion, the slightest possible shock, instantly followed by a perfect and general glow, which usually continues during the whole time the person is in the bath, and indeed generally lasts for several hours afterwards.

The chalybeate water was analysed by Sir Lyon Playfair. The imperial gallon was found to contain 1'044 grains of proto-carbonate of iron. It is a simple chalybeate water. It should be taken after food, rather than before food. The chalybeate and tepid waters are often mixed together, and so taken with much benefit. It is also used and valued as an application to the eyes.

The tepid waters of Buxton, whether drunk or used as a bath, or made use of in both ways, are found to be especially useful in cases of rheumatism, gout, neuralgia, spinal irritation, and certain forms of derangement of the digestive, urinary, and uterine functions.

The effect of the water on the system, whether in health or disease, is essentially stimulating. The stimulating effect is usually produced more immediately, and in a more marked degree, when the waters are drunk, than when they are only used as a bath; but the effect is generally of much shorter duration. When the waters are drunk by a person in perfect health, they frequently produce a slight sense of giddiness, followed by a sufficiently perceptible degree of increased warmth, and the usual marks of increased action that attend the use of another stimulant. If however the waters have not disagreed with the system, these indications will be found to pass away very speedily. If not thus rapidly got rid of, or if the internal use of the waters be continued under improper

circumstances, the excitement increases, and irritation is set up—marked by thirst, loss of appetite, headache, quickened circulation, and other symptoms of feverishness and derangement. The effect of the bath on a healthy system is, that the momentary shock at the instant of immersion is followed promptly by reaction, with a decided general glow, and increased vigour of mind and body, increase of appetite, and of general secretion and excretion. This is apt to be followed in the course of a few days—the use of the bath being continued every day, or even if used somewhat less frequently—by some degree of sluggishness of the organs, and, these indications being unheeded, by feverishness and general derangement. It need hardly be said that no such effects would succeed the drinking of repeated tumblers of common warm water at the temperature of 82°, nor would such be induced by bathing repeatedly in water of this temperature; and this would be sufficient to show that the tepid waters of Buxton have specific and remarkable effects upon the human system, and be *a priori* evidence that they may be influential in certain cases of disease.

The fact that these waters are so essentially and largely stimulating renders especial care necessary that they be not made use of under improper circumstances, and that every means be taken to render the cases to which they are adapted as fit as possible for their beneficial operation.

In regard to the first of these particulars, it should be known that cases of recent organic change or structural alteration in any of the great internal organs, whether of the brain, heart, lungs, liver, or kidneys, would be *prima facie* evidence that these waters should not be made use of. And it should be added that, in cases where disease is of congestive or inflammatory type, they should either not be used at all, or used most cautiously, until the congestion or inflammation has been subdued by appropriate means.

In regard to the second of these particulars—*i.e.*, to adapt the system as far as may be to the use of these waters—to fit it, as far as possible, to derive the fullest benefit from their use, it is of primary importance to secure a free and active condition of the great excreting organs. For this purpose, two or more doses of efficient aperient medicine are often usefully taken, before the course of these waters is commenced; and moreover,

during the course, it is found by most people that an occasional aperient is quite necessary. The compound rhubarb pill, or the compound extract of colocynth, in pills of five grains each, of which one or two may be taken at bedtime, when required, often subserves this important purpose sufficiently well.

The primary effect of these waters, however used, is essentially stimulating. Their secondary effect is equally and essentially debilitating. After they have been used for a longer or shorter time, according to the nature of the case and the strength of the individual, they begin to impair the powers of the system; and this is to be regarded as the best proof that the course has been persevered in for a sufficient length of time to enable the waters to influence, as far as possible, the complaint under treatment. This debilitating effect, in most cases, ceases within a very short time of their being discontinued.

BATH.—The following analyses, which have been kindly supplied to me by Dr. Charles T. Griffiths, the resident medical officer of the Bath General or Mineral Water Hospital, will place the facts in relation to these waters in an intelligible shape before the professional reader. They are “calcareous,” that is to say, carbonate and sulphate of lime constitute their principal ingredients. Such waters as these are useful chiefly in cases of *chronic* gout or rheumatism. Theoretically, the waters of Bath and Buxton are classed together; but it will be manifest from the observations of Dr. Robertson, and on comparison of the two analyses, that they have very little in common.

Analysis of Bath Water as it flows from the Spring, and of Aërated Bath Water, by PROFESSOR ATTFIELD, F.I.C., F.C.S., Professor of Practical Chemistry to the Pharmaceutical Society of Great Britain.

August 30th, 1879.

“I find that one gallon of Bath water contains in round numbers 168 grains of the various solid substances on which its

medicinal virtues depend, and 69,944 grains of water, together forming 70,112 grains-weight, or 70,000 grain measures. The water is therefore slightly heavier than rain water, in the proportion of 1001'6 to 1000'0. I find that aërated Bath water is absolutely identical with the Bath water as it flows from the spring, except that the spring water has been aërated just as soda water, seltzer water, and many other mineral and medicinal waters are aërated—namely, by carbonic acid gas.

“The analytical data on which the foregoing statements are founded are given in the following tables. The first table shows the name and quantity in imperial grains of the various elements, &c., contained in one imperial gallon of the water.

“The second table gives the forms in which these elements, &c., are probably contained in the water.

THE ELEMENTS IN BATH WATER, AND THE QUANTITIES IN GRAINS IN ONE GALLON.

		Before Aëration.	After Aëration.
	Calcium Ca	... 30'9523	... 31'1670
	Magnesium Mg	... 4'0112	... 3'9277
	Sodium Na	... 13'4546	... 13'4508
	Potassium K	... 3'0044	... 3'0933
	Ammonium NH ₄	... '2370	... '2000
	Iron Fe	... '5876	... '5525
Radicals of	{ Carbonates CO ₂	... 5'7346	... 5'5176
	{ Chlorides Cl	... 20'5893	... 20'5577
	{ Nitrates NO ₃	... 1'2421	... 1'1537
	{ Sulphates SO ₄	... 85'7706	... 86'3614
	{ Silica SiO ₂	... 2'7061	... 2'6101
		<hr/>	<hr/>
		168'2898	168'5918

“These results of the analyses of the Bath water before aëration and after aëration are practically identical. With the sodium and potassium are associated traces of rubidium and lithium, and with the calcium a trace of strontium.

THE COMPOUNDS NATURALLY CONTAINED IN BATH WATER AND THE QUANTITIES IN GRAINS IN ONE GALLON.

	Before Aëration.	After Aëration.
Carbonate of calcium	7·8402	7·6501
Sulphate of calcium	94·1080	95·0664
Nitrate of calcium	·5623	·6000
Carbonate of magnesium	·5611	·4700
Chloride of magnesium	15·2433	15·0159
" sodium	15·1555	15·3833
Sulphate of sodium	23·1400	22·8516
" potassium	6·7020	6·9000
Nitrate of ammonium	1·0540	·9000
Carbonate of iron	1·2173	1·1444
Silica	2·7061	2·6101
	<hr/>	<hr/>
	168·2698	168·5918

THE NATURAL GASES IN BATH WATER, AND THE QUANTITIES IN CUBIC INCHES IN ONE GALLON.

Oxygen gas	·74
Nitrogen gas	4·60
Hydrocarbons	none
Carbonic acid gas	4·17
	<hr/>
	9·51

"The aërated Bath water will of course contain, in addition to the gases just mentioned, large volumes of the ordinary aërating-gas—namely, carbonic acid gas—a gas already naturally present to some extent.

"JOHN ATTFIELD."

Mr. W. Walter Stoddart, F.C.S., F.G.S., &c., analytical chemist, of Bristol, has also analysed the water, with the results stated below :—

ANALYSIS OF THE BATH WATER FROM THE SPRING.

	Grains.
Carbonate of calcium	7·117
Sulphate of calcium	94·091
Carbonate of magnesium	·446
Chloride of magnesium	15·044
Chloride of sodium	15·615
Sulphate of sodium	22·547
Sulphate of potassium	5·284
Carbonate of iron	1·019
Silica	2·986
	<hr/>
Total contents per gallon	164·149

The following is another analysis :—

CONSTITUENT PARTS IN 100,000.	Merck and Galloway. King's Bath.		Mackay Heriot, F.G.S. (Captain Royal Marine Light Infantry). King's Bath.		Het. Pump. Cross Bath.	
	Calcium	386.7	377	401	388	
Magnesium	53.9	47.4	52.2	46.8		
Potassium	39.8	39.5	31	37.5		
Sodium	160	129	137	140		
Lithium	—	Traces.	Traces.	Traces.		
Iron	7.4	6.1	6.7	4.5		
Sulphuric acid	1029.5	869	884	895		
Carbonic acid (combined)	86.9	86	89	83.5		
Chlorine	265.3	280	275	280		
Silica	42.6	30	39	38		
Strontium	—	Traces.	Traces.	Traces.		
Alkaline sulphides	—	Traces.	Traces.	Traces.		
Carbonic acid gas at normal temperature and pressure (cubic centimetres per litre)	—	65.3	80.4	51.5		
Total solid contents in 100,000	2062.1	1864	1911.9	1913.3		
Specific gravity	—	1.0015	1.0022	1.002		

Temperature—King's Bath, 117 deg. Fah.; Hot Bath, 123 deg. Fah.; Cross Bath, 104 deg. Fah.

The Nitrogen daily evolved from the springs amounts to about 250 cubic feet.

Of STRATHPEFFER it may be briefly said that the waters there are admirable for gouty skin diseases and muscular gout—commonly called muscular rheumatism. They may also be suitable for other of the more localized and special forms of gout in patients who do not greatly object to bathing in brimstone; but inasmuch as they hold sulphur in suspension rather than solution, and contain a mere trace of the *sulphides*, they do not offer the same advantages as the waters of Harrogate, with which they may be compared.

ANALYSES OF STRATHPEFFER SULPHUR WATER.

In the imperial gallon.	Strong Well.	Upper Well.
1. SOLIDS.		
Sulphate of lime	50'92	23'43
Carbonate of lime	14'88	6'24
Phosphate of lime and magnesia	0'50	—
Sulphate of magnesia	31'08	39'18
Carbonate of magnesia	traces	1'78
Sulphate of soda	5'86	9'87
<i>Sulphuret of sodium</i>	0'53	0'12
<i>Sulphuret of potassium</i>	1'30	0'89
Silica	2'14	3'06
Organic matters	1'02	2'35
<i>Sulphur in suspension</i>	4'07	1'84
Chlorine	traces	—
Chloride of sodium	—	4'54
<i>Sulphide of iron</i>	—	1'08
	112'30	94'38
2. GASES.		
Sulphuretted hydrogen	4'34	1'21
Cubic inches	11'26	3'03
Carbonic acid undetermined	—	—

The sulphuretted hydrogen gas has been estimated at different seasons with the discovery that during the cold season (April) its volume rises to 22 cubic inches per gallon, while in warmer seasons (September) it does not

amount to more than 11 cubic inches, It would, therefore, appear that in cases in which it is more important that the skin should be saturated with the gas, rather than that the skin should be simply washed with the sulphur, the spring months are the best at Strathpeffer. There is also an effervescing chalybeate water, which contains about $2\frac{1}{2}$ grains of carbonate of iron in the imperial gallon, and 12 cub. in. of dissolved gases.

As far as my own experience and judgment of expediency go, I am prepared to endorse the observations of Dr. Oliver* on the subject of "Harrogate and Buxton or Bath in the treatment of chronic gout and rheumatism. The writer has frequently witnessed a marked improvement from associating the therapeutic advantages of these watering-places in certain cases of chronic gout, rheumatic gout, and chronic rheumatism; as when these arthritic diseases had induced much crippling, and were still progressing, and especially when the portal system was deranged, or was suspected to be the source whence pathological products arose which maintained these ailments. He is therefore inclined to suggest to his professional brethren this combination of the principal natural remedial resources of this country in the management of these obstinate chronic diseases, which generally defy ordinary treatment: believing that many cases of this type frequently sent to foreign spas—such as Aix-les-Bains and other thermal stations—would obtain more relief at home, without the detractions involved in the fatigue and discomforts of long journeys and in the uncongenial

* "The Harrogate Waters, Data Chemical and Therapeutical, &c.," by George Oliver, M.D. Lond. &c. (H. K. Lewis), pp. 193-4.

elements of life abroad, by resorting in the first place to Harrogate for internal treatment, and then, after a short pause, to Buxton, or, in the winter months, to Bath. In chronic gout and rheumatism these thermal resorts are complementary to Harrogate, and *vice versa*; for, while the latter is therapeutically fitted to deal more effectually with the inward ailments, the former are more serviceable in the local treatment—liberating crippled joints, &c.”

WATERS.—The mineral waters recommended for use in gout, or by persons of the gouty constitution, are too well known to the profession to need special notice here. In my own practice I do not extol these waters; and tolerate rather than suggest their employment. I think it would be better, if we could only ensure it, to advise our patients to drink pure water for medicinal and general purposes. The value of *pure* spring water in gout is not sufficiently appreciated. Vichy, Vals, and the other best-known waters are all apt to cause flatulency, while the purging waters are, according to the view I take of gout, distinctly contra-indicated, because they draw fluid away from the kidneys, which it is all-important to *flush*. The only water I prescribe is the Kronenquelle, derived from a spring in the courtyard of the “Prussian Crown,” an hotel at Obersalzbrunn, Silesia.* It is one of the soda-lithia waters, containing a minimum of iron, and not too saline to be palatable. It retains its freshness for a long period, and can therefore be bottled and sent abroad without the need of re-charging it with carbonic

* Messrs. W. Schacht & Co., druggists, 26 Finsbury Pavement, London, E.C., are the agents.

acid gas. The following is the analysis reported by Professor Poteck, of Breslau:—

Chloride of sodium	0'05899 parts
Sulphate of sodium	0'18010
„ potassium	0'04086
Bicarbonate of sodium	0'87264
„ lithium	0'01140
„ calcium	0'71264
„ magnesium	0'40477
„ strontium	0'00280
„ manganese	0'00181
„ iron	0'00913
Phosphate of aluminium	0'00036
Alumina	0'00047
Silicic acid	0'03460
Total	<u>2'33057</u>

The free carbonic acid in 1,000 c. c. of the water at + 50° Fah. is equal to 849'4 c. c., the barometer standing at 740 mm.

SEA-BATHING.

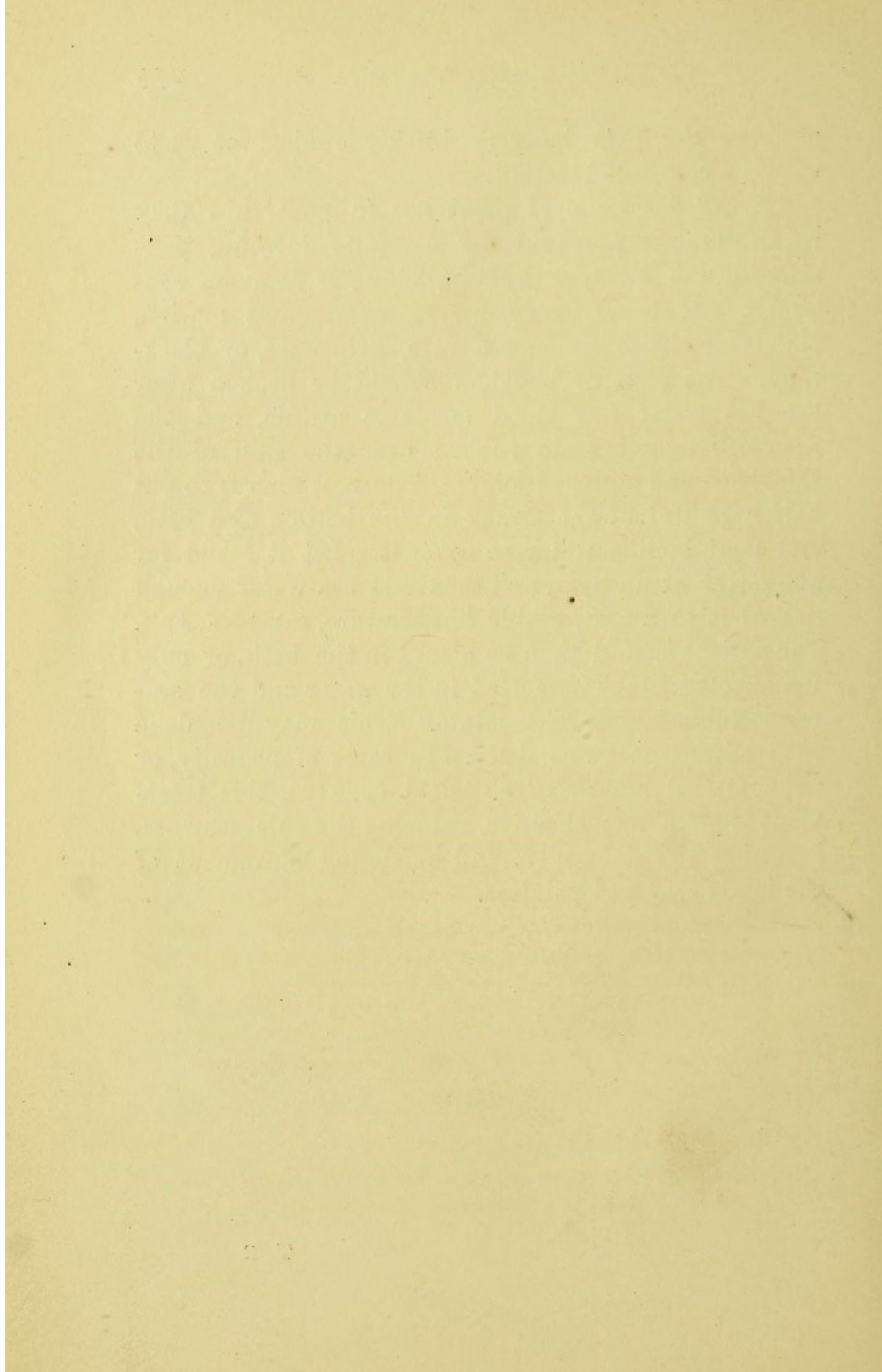
The subjects of crippling gout are, in the majority of instances, incapacitated for bathing in the sea; and not much good is to be gained by the use of "salt water" taken from the sea, or of the several imitations of sea-water which have become popularized, so far as the specific action of the salt is concerned. The chief value of the salt water lies in its density, and to be of use it ought to be in motion. The stimulating effect of the dilute brine on the skin is certainly valuable. It excites the subcutaneous arterioles to contract, and, by so doing, to offer just that resistance to the heart's action which exalts the energy of its contractions without unduly increasing their frequency. There is also, no doubt, a stimulating impression on the

surface nerves in bathing which is greater with salt water than with fresh. Therefore, sea-water is, *per se*, better than ordinary water for bathing purposes ; but a very essential part of the sea-bathing consists in the nerve-excitation produced by an ever-stirring element. In short, the internal movement of the water lends virtue to the sea-bath. With a view to the attainment of this internal movement, which is present even in the calmest sea, I have devised an apparatus that will agitate the water of an ordinary bath, by means of a vulcanite disk submerged and so directed that the vibration may be limited to any special area or made general at will. The machine is a very simple one, put in motion by the foot as a sewing-machine is worked, and it is so arranged that it may be placed by the side of any bath, either hip, slipper, sponging, or full length, and can be managed with great ease by a nurse.* Thus vibrated, the salt-water bath may be used at home in the case of gout cripples. For those who are able to take the exercise, bathing in the open sea in warm weather, *when the sun is on the water*, is to be preferred, and can scarcely fail to prove useful. It must, however, be borne in mind that gouty patients are especially liable to cramp, and they should not, on any account, or under any conditions of seeming health, be allowed to bathe except in the company of good swimmers or in shallow water. Nor is it wise for them to remain in the sea more than five, or at the utmost ten, minutes at a time. On coming out, either a warm bath should be

* Messrs. Weiss, the surgical instrument makers, 62 Strand, are the manufacturers, and from them the apparatus can be procured, or hired for use in any special case.

used or the skin be very briskly rubbed so as to ensure a complete reaction.

“*Kelp*” *baths* are of great use in gout, but they require to be prepared by carefully infusing pod-seaweed, the *Fucus vesiculosus*, Linn., or common seawrack. It is variously known as quercus marina, bladder fucus, common sea-ware, kelp-ware, or black-tang. The pods or bladders should be broken after the hot water has stood on them awhile, and the mucilage they contain rubbed over the skin of the thickened and stiffened joints. The best plan is to put half a pailful of the wrack in the bottom of a bath, and pour boiling water to cover it. Let it stand for a quarter of an hour, and then add sea-water enough to cool it to a comfortable temperature, say 100° Fah. The patient should then be placed in the bath, or only the affected limbs immersed in the water and the seaweed rubbed over the joints. This may be done with advantage twice daily. In cases of nodosity, or “rheumatoid arthritis” so-called (p. 215), this treatment is often very effective, reducing the enlargements, lessening the deformity, and rendering movement of the joints easy and painless.



SYNOPTICAL INDEX OF DRUGS.



Only such drugs as are either not in common use, or seemed to call for special remark in connection with their employment in gout, have been included.

The doses named are not always those given in the books, but those which have appeared to ensure the best results in this particular malady.

ACIDUM BENZOICUM. (*Styrax Benzoin.*)

Benzoic acid may be given in the form of a pill, gr. iv., with one minim of glycerine, but it is better given as a benzoate. (See *Sodii Benzoas*, below, and remarks at p. 50.)

Dose:—gr. iv.—xv.

Acidum Benzoicum, F. 30, p. 207.

Benzoic Arrack, p. 201.

ACIDUM CHRYSOPHANICUM.

An ointment:

℞ Acidi chrysophanici, gr. x.
Adipis benzoati, ʒj.—Misce.
Fiat unguentum,

is a good application in the psoriasis of gout. I have also found it useful in eczema, herpes, and ulcerations discharging a watery ichor which contains crystals of uric acid or sodium urate—*e.g.*, of the lip, the nose, the external ear—common in gout. It should be understood that chrysophanic acid stains the skin; but the discoloration can be removed by solution of potash. I have no experience of the internal use of this acid.

ACIDUM SALICYLICUM.

Ought to be prepared from salicin, but is not. It is commonly prepared "by heating carbolic acid with caustic soda in a suitable vessel, and passing a stream of carbonic acid through it" (Martin-

dale's *Extra Pharmacopœia*). Its action ought, I think, to be regarded as that of a cardiac sedative. It may be detained in the organism, and during its administration the urine should be tested with a persalt of iron, which will strike a purple colour. (See Salicinum, p. 296.)

Dose:—gr. v.—xxx. ; best given as *Sodii Salicylas* (*q.v.*).

ACIDUM TANNICUM.

There is reason to suppose that this acid decomposes the sodium urate while passing through the fluids in which it is contained, although, or possibly because, it undergoes a transformation *in transitu*, being converted into gallic acid. The properties of these two acids, though they are closely related, differ considerably. For example, tannic acid precipitates albumen and gelatine, whereas gallic acid does not throw down either, and does not decompose alkaloids. When tannic acid is administered, it appears in the urine as gallic acid. There can be no doubt as to the value of tannic acid in gout, but its *modus operandi* needs to be investigated.

Dose:—gr. ij.—xx.

Acidum Tannicum, F. 22, p. 204 ; 127, p. 236.

ACONITI RADIX. (*Aconitum Napellus*.)

Aconite root is a powerful febrifuge. It slows the action of the heart, and reduces inflammation more rapidly than any other drug with which I am acquainted. It should be used only when either the pulse is strong or time is an object, and always as the tincture of the British Pharmacopœia, which is a manageable preparation, enabling the practitioner to use this potent drug with confidence and certainty. It is well to have it dispensed in draughts or small mixtures, so that the whole bottleful may contain less than a poisonous dose.

Dose:—The quantities given in the books are, I think, too large. Instead of \mathfrak{v} .— \mathfrak{xv} ., I would say \mathfrak{ij} .— \mathfrak{v} .: *e.g.*, \mathfrak{ij} . every hour, or \mathfrak{ij} . every second hour, and so on.

Tincturæ Aconiti, F. 5, p. 193 ; 131, p. 240.

AMMONIÆ BENZOAS, $\text{NH}_4\text{O}, \text{C}_{14}\text{H}_5\text{O}_3$, or $\text{NH}_4\text{C}_7\text{H}_5\text{O}_2$.

Diuretic ; but used chiefly as a ready way of giving benzoic acid, being very soluble. Like the benzoate of sodium (*q.v.*, p. 298), it

appears in the urine as hippuric acid. May be given with the sodii benzoas, or in place of it. For ordinary use sodium benzoate is to be preferred.

Dose:—gr. x.—xx.

Ammon. Benz., F. 9, p. 193.

AMMONII CHLORIDUM, NH_4Cl . (*Sal Ammoniac.*)

A powerful remedy in neuralgia. It is also what used to be called a "discutient," promoting the reduction of swellings by the absorption of effusions. Of great value in gout and rheumatism, not only to relieve the pain, but to reduce the inflammatory action and fever without depressing. (See p. 42.)

Dose:—gr. x.—xxx.; anything above ℥j. is likely to produce sickness. Up to ℥j. it does not irritate.

Ammon. Chlor., F. 4, p. 192; 99, p. 231.

AMMONIÆ PHOSPHAS, $2\text{NH}_4\text{O}, \text{HO}, \text{PO}_5$, or $(\text{NH}_4)_2\text{HPO}_4$.

A solvent of sodium urate. Very useful in gout and lithiasis. Should be given much diluted.

Dose:—gr. x.—xx.

Ammon. Phosph., F. 5, 6, p. 193.

AMMONII SULPHIDUM, NH_4HS .

Said to be powerfully depressing. I have not found it so. The chief drawbacks to its use are the difficulty of preventing its decomposition with the deposit of sulphur and its extremely disagreeable taste. It is, however, I am convinced, a most valuable medicine, especially in the rheumatic or rheumatoid forms of gout, or in acute rheumatism, for which I have recommended it elsewhere.

Dose:—ʒij., cautiously increased. I give it in *distilled aquæ menthæ viridis*. (See pp. 206-7, and 256-7.)

Ammonii Sulphid., F. 28, p. 206.

ARMORACIÆ. (*Radix.*)

Horseradish root has, I am inclined to think, properties not adequately appreciated as a nerve-tonic, so far at least as the sympathetic system is concerned. For example, I have found nothing to

compare with it as a stomachic during the withdrawal of the morphia in the treatment of advanced cases of morphism.

Dose of Spiritus Armoracæ Compositus, which includes dried orange peel, in equal quantity, and a little nutmeg, is ℥j.-℥ij.

Spirit. Armor. Comp., F. 60, p. 219.

ASPARAGIN. (*Asparagus Officinalis*, &c.)

Asparagin, or althein, is a very useful diuretic in gout. It seems to possess a special power of stimulating the kidney function—whether by increasing or diminishing the tonicity of the arterioles I have failed to determine. I incline to the belief that it acts by reducing the pressure, as nitro-glycerine acts in contracted kidney; but at the periphery—*i.e.*, locally and reflexly—instead of at the centre.

Dose:—gr. j.-ij.

Asparagin, F. 13, p. 194; 34, 35, p. 208.

BISMUTHUM.

I must own to a great deal of scepticism as to the actual value of this quite old-fashioned remedy for gastric troubles. I have never been able to convince myself that the result which appeared to be produced by this remedy was actually due to its action. Where it is of use, I fancy its effect is *topical*, as in patchy congestion, or ulcer, of the stomach.

Dose of the Subnitrates, gr. v.-xx.; of the *Liquor Bismuthi et Ammoniac Citratis*, ℥ss.-℥j., or more; of the *Carbonate*, gr. v.-xx., and of the *Bismuthi Oxochloridum*, gr. v.-xx. It should be given suspended in mucilage.

Bismuthi Subnitrates, F. 61, p. 220.

CAFFEINA.

Useful as a nerve-tonic in neuralgia. It is also a good nerve-stimulant, and, if given in very moderate doses so as to act simply as a gentle excitant to function, and not exhaust, it is a restorative. The drawback to its use is that it undoubtedly tends to produce wakefulness, even in small doses, such as two grains. This may, however, be obviated by combining it with cannabin tannas or piscidia, thus:

℞ Caffeinæ valerianatis, gr. ij.
 Sodii benzoatis, gr. x.
 Cannabin tannatis, gr. iv.
 Spiritus ammoniæ aromatici, ℥xx.
 Aquæ, ad ℥iiss.—Misce ;

or

℞ Caffeinæ valerianatis, gr. ij.
 Extracti piscidiæ erythrinæ fluidi, ℥j.
 Sodii benzoatis, gr. x.
 Spiritus ammoniæ foetidi, ℥ss.
 Aquæ, ad ℥iiss.—Misce.

Dose :—Caff. val., gr. j.-ijj. Caff. citr., gr. j.-v.

Caffeinæ Valerianas, F. 90, p. 229. *Caffeinæ Citras*, F. 105, p. 232.

CALCII SULPHIDUM. (*Monosulphide of Calcium.*)

Sulphide of calcium, when it decomposes, gives off sulphuretted hydrogen, which acts powerfully on the blood, in carefully guarded doses decomposing the urate of sodium. (See remarks on the sulphides, pp. 206-7 and 256-7.)

Dose, in form of pill with sugar of milk, $\frac{1}{10}$ to 1 gr., watched carefully.

Calcii Sulphid., F. 29, p. 207.

CALUMBÆ RADIX.

Calumba root is a very mild stomachic and tonic. It contains neither tannin nor gallic acid, and therefore is not incompatible with iron, but it has not any special value that I can discover, except for a peculiarly restorative influence on the stomach. This property makes it more useful than many other mild bitters in gout.

Dose of the *Infusum Calumbæ*, ℥j., or more.

Infusum Calumbæ, F. 54, p. 218; 69, p. 222.

CANNABIS INDICA.

Indian hemp is an important sedative tonic, which has been strangely neglected. In my hands it has proved especially useful in controlling excitement and giving stability to nerve action. It improves the appetite, does not lock up the secretions, and, with very rare ex-

ceptions due to idiosyncrasy, appears to relieve pain and produce quiet without depression. I only use the tincture.

Dose:—*Tinctura Cannabis Indicæ*, ℥v.–xx., rarely more than ℥x.

Tinct. Cannabis, F. 26, p. 205.

CANNABIN TANNAS.

Cannabin tannate is an excellent anodyne and soporific. It does not produce any unpleasant or disturbing effects, either on the nervous system or the digestive or secretory functions. It is well suited for excitable males and hysterical females, and does good service in cases of nervous irritability depending on organic disturbance.

Dose:—gr. ij.–vj. in a pill with glycerine of tragacanth, or in an alkaline solution.

Cannabin Tannas, F. 16, p. 195; 94, p. 230; 112, 113, p. 233; 119, p. 234.

CAPSICUM. (*Capsici Fructus*.)

This is not simply a topical stimulant, but in my experience has a very powerful effect on the nervous system. I have treated cases of nerve-prostration closely resembling *delirium tremens* with capsicum alone, and found it perfectly successful as a restorative-tonic. It has also the power of preventing headache when given with quinine. I have recommended it as a *snuff* in hay-fever and hay-asthma, both of which troublesome affections are of particularly common occurrence as forms of irregular gout. The following is the formula for Pulv. Boracis Co.:—R. P. boracis, ℥v.; Ammon. carb. pulv., ℥iiss.; mix well, and add Capsici pulv. subtil., ℥j. Mix thoroughly in a *very fine* powder; to be used as snuff. Seldom more than one or two pinches will be necessary. After the excitation caused by the dose subsides, there is relief of the pre-existing distress.

Dose of the *Tinctura Capsici*, ℥v.–xx.

Tinctura Capsici, F. 72, p. 224; 81, p. 227.

CASCARA SAGRADA.

The bark of *Rhamnus Frangula* is useful in habitual constipation. It is also a good stomachic-tonic to the digestive organs in gouty dyspepsia.

Dose of the *Extractum Cascaræ Sagradæ Fluidum*, which is the best preparation, ℥x.–℥j.

Extractum Cascaræ Sagradæ, F. 85, p. 228; 89, p. 229.

CASTOREUM. (From *Castor Fiber*, the Beaver.)

This animal secretion is an energetic stimulant and antispasmodic, valuable in those forms of retrocedent gout in which a powerful excitation of the vaso-motor nerves and the muscular fibres of any organ which may be attacked is necessary to rouse it to instant activity, thereby surmounting the *shock* of the so-called metastasis: the hypothesis being that the localization of the gout is in the weakest or most depressed and atonic part, where the arteries have lost their tone, the veins are congested, and the physical state is favourable to effusion.

Castor acts like musk in these cases, but I think not quite so well. (See Moschus.)

Dose of the Tincture, ℥ss.-℥j.

Castoreum, F. 56, p. 219.

CIMICIFUGIN, *Cimicifuga Racemosa*, vel *Actæa Racemosa*.

I have had considerable experience of the value of this remedy, as tinctura actææ, in gouty neuralgia and the neuralgia of gouty rheumatism, or rheumatic gout, and have found it, on the whole, satisfactory.

Dose of Tincturæ Actææ, ℥v. every two or three hours or oftener in severe cases, or ℥ss. twice or thrice daily. Cimicifugin may be given in a pill with glycerine of tragacanth in doses of gr. j.-vj.

Tincturæ Actææ, F. 92, p. 229.

COCA. (*Erythroxyton Coca*.)

Useful in gout to allay the irritability of the attendant dyspepsia. I do not think coca prevents, or even reduces, tissue-change. It relieves the *sense* of hunger, by acting as a sedative on the nerves of the stomach, just as cocaine produces anæsthesia of the surface when applied for surgical purposes. In the various forms of nervous dyspepsia and gastrodynia it is valuable. The liquid extract (*Extractum Erythroxyton Fluidum*, U.S.) is the most elegant preparation; but a wine made with about 1 in 30 is recommended, and I have found it effective.

Dose of the Fluid Extract, ℥ss.-℥ij.; of *Vinum Cocæ*, ℥j.-℥ij., or more.

Extractum Erythroxyton Fluidum, F. 111, p. 233.

COLCHICUM AUTUMNALE. (*Common Meadow Saffron.*)

Believed to have been the active ingredient in all the older gout medicines. (See pp. 190-1.)

Acts on the liver, or rather on the biliary ducts, producing an outflow of bile, probably by irritating the orifice of the common duct in the duodenum. Depresses the heart's action, relieves pain by exhausting the excitability of the nervous system, and in this way, if at all, proves sedative. It is an irritant cathartic. The excretion of uric acid is not directly augmented during its exhibition. The wine is prepared from the corm, the tincture from the seeds.

Dose:—*Vinum Colchici*, ℥x.-xxx., *Tincturæ Colchici*, ℥x.-xxx.

It is thought desirable to give colchicum in fairly large doses—*i.e.*, ℥xx.-xxx.—but to watch the effect carefully and not to give more than about ℥ij. in all during the twenty-four hours. If it purge, it will do harm by reducing the fluid of the blood, while possibly setting up local irritation in the intestines. The wine is generally preferred, but there is not much difference in the value of the two preparations.

Vinum C., F. 1, 2, 3, p. 192; 59, p. 219; 64, 66, p. 221; 69, p. 222.

CONVALLARIA. (*Majalis.*) (*Lily of the Valley.*)

A valuable and excellent diuretic, suitable in cases in which the heart is affected either by nervous irritation, as often happens in gout, or with organic disease, whether valvular or muscular. It has none of the drawbacks of digitalis.

Dose of the *Extractum Convallariæ Fluidum e Floribus*, ℥v.-xx.

Commence with a small dose; ℥v.-x. will generally suffice, largely diluted.

CONIUM. (*Conii Folia.*)

Only the succus conii (the juice expressed from the fresh leaves, with one part of rectified spirit to three parts of the juice) is trustworthy, and even this preparation varies. It acts as a sedative on the peripheral extremities of the nerves, and—when it proves effective—relieves the localized sensation of pain without greatly disturbing the nervous centres. At the same time it relaxes the tissues of the parts affected. I am therefore inclined to think that of all sedatives succus conii is the most useful in gout. Moreover, it does not repress the secretions. (See p. 46.)

Dose:—℥ss.-℥j., or more, carefully.

Succus Conii, F. 12, p. 194; 118, p. 234.

COTO CORTEX.

Coto bark is not as well known as it ought to be. It is astringent in its properties and very useful to check diarrhœa, particularly that which depends on an atonic or irritative outpouring of mucus. Gastric and intestinal catarrh are both relieved by it, and it is especially valuable in the incidental disturbances of stomach and intestines in gout. It also appears to contribute to the reduction of the irritative fever in both gout and rheumatism; in the latter affection it moderates the perspiration.

Dose:—℥x. of the Tincture suspended in mucilage.

Tinctura Coto, F. 17, p. 195.

CUSPARIA. (*Cortex.*)

The cusparia or angustura bark is a stimulant tonic to the sympathetic or organic nervous system, and particularly the nerves of the stomach. It is not very potent, but seems to answer well as a restorative to some organisms. I do not think it is of so much service in the case of the weak as in that of the wearied and jaded. For some of this latter class of subjects it certainly proves useful.

Dose of the *Infusum Cuspariæ*, ℥j. or more.

Infus. Cuspar., F. 57, p. 219; 72, p. 224; 77, p. 225.

DAMIANA. (*Leaves of Turnera, U.S.*)

Loss of sexual power is very commonly a complaint of the gouty. In such cases try *Extractum Damianæ Liquidum*.

Dose:—℥j.-℥ij.

DIGITALIS.

This familiar drug may be employed in gout, when the heart is affected, as a cardiac-sedative; but I think it is well to give very moderate doses, and not to continue it longer than necessary. It is of only secondary value as a diuretic in this malady, as the deficiency of urine is not due to heart failure. It may be useful in some cases of contracted kidney with cardiac complication; but see *Paraldehydum*, *Convallaria*, and *Nitro-glycerinum*.

Dose of the Tincture, ℥v.-xv.

Tinctura Digitalis, F. 63, 67, p. 221.

ERGOTINA. (*A Purified Aqueous Extraction of Ergot.*)

This is a most important agent in the treatment of many of the special forms of irregular gout and in warding off metastasis. If there be a sudden fall of local temperature in the region of an affected extremity there is danger of "metastasis," and a timely dose of ergotine will, not unfrequently, prevent atonic dilatation of the vessels of some internal organ, thus arresting the cause of the new localization supposed to be effected by *metastasis*. (See pp. 84-91, and 190.) It is also useful as an adjunct to diuretics in atonic states of the kidney; or when the diuretic is itself to act by inhibition of the vaso-motor excitement which holds the arterioles spasmodically contracted. (See Asparagin.)

Dose of Ergotina, gr. j.-iij. in a pill with althæa.

Ergotina, F. 13, p. 194.

EUCALYPTUS GUMMI. (*Eucalyptus Rostrata.*)

Eucalyptus, or "red," gum, is of great value in the treatment of disorders of the mucous membrane in gout—*e.g.*, in the follicular pharyngitis so common in gouty young women; in catarrh of the Eustachian tube, which is often an extension of the last-mentioned affection; in bronchial catarrh; and in catarrh of the stomach and intestines.

Dose of Syrupus Eucalypti Gummi (Squire), ℥ss.-℥j.; *Tinctura Eucalypti Gummi* (Squire), ℥xx.-xl.

Tinctura Eucalypti Gummi, F. 72, p. 224; 102, p. 231.

EUONYMIN. (*Euonymus Atropurpureus.*)

A fairly good laxative in moderate doses. It is said to be a hepatic stimulant. I have not proved it to be this; but it certainly produces small discharges of bile, which I am inclined to think come from the gall-bladder. It seems to me to be chiefly useful to clear the gall-bladder. It acts best in combination with some other aperient, which should be chosen for its value as an excitant of the reflex.

Dose:—gr. j.-v., in a pill with glycerine of tragacanth or ext. hyos.

Euonymin, F. 36, p. 210.

FUCHSINE. (*Rosaniline Monohydrochlorate.*)

Magenta is of great value in the albuminuria of gout; often putting a stop to the voidance of albumen in the urine with a rapidity which is surprising.

Dose:—gr. ss.-iv. in a pill with glycerine of tragacanth. One-grain doses seem to answer best.

Fuchsine, F. 125, p. 236.

FUCUS VESICULOSUS. (*Bladder Wrack.*)

From the sea-weed of that name, whence "kelp." Of use in certain cases of gouty obesity with a plethoric habit, and deserving a trial in gouty effusions of long standing (see p. 275).

Dose of the Liquid Extract, ℥j.-ij. before food.

Extractum Fuci Vesiculosi Liquidum, F. 71, p. 224.

GELSEMIUM. (*Gelsemium Sempervirens.*)

The tincture of gelsemii, which is prepared from the gelsemium root, is of considerable service in many cases of gouty neuralgia, particularly when it affects the lower or the middle branch of the fifth nerve; but it will not relieve *frontal* neuralgia. It is important to note this distinction in practice.

Dose:—℥v.-xx., or occasionally xxx., but with caution. It may be given with lithium bromidum (p. 290), or pot. iod. I do not use bromide of potassium under any circumstances, as I believe it to have a peculiarly depressing and injurious effect on the nervous centres.

Tinctura Gelsemii, F. 93, p. 230.

GLYCERINUM, $C_6H_8O_6$, or $C_3H_8O_3$.

Glycerine is not simply useful as a demulcent; it is valuable as heat-food or fuel. I have seen excellent results from the free consumption of glycerine in gout; a teaspoonful being taken, in any fluid food, frequently. It is also serviceable, I think, on account of its affinity for oxygen, favouring the breaking up, in its progress, of combinations otherwise stable.

Dose:—℥ss.-℥ij.

Glycerine.—Formulæ in which it appears as a medicine: 4, p. 192; 9, p. 193; 12, p. 194; 20, p. 203; 32, p. 207; 60, p. 219.

GRINDELIA. (*Grindelia Robusta* and *Grindelia Squarrosa*.)

In the spasmodic cough of bronchitis and asthma and gouty throat affections.

Dose of the Fluid Extract, ℥x.-xxx.

Extractum Grindeliæ Fluidum, F. 104, p. 232.

GUARANA. (*Seeds of Paullinia Sorbilis*.)

Similar in effects to caffeine, but is more suitable in the headache and "biliousness" of the gouty. Allays gastric and intestinal irritation.

Dose of *Tinctura Guaraniæ*, ℥ss.-℥j. ; of *Guaranine*, gr. j.-v.

Guaranine, F. 91, p. 229.

HAMAMELIS. (*Witch Hazel, U.S.*)

Useful as a topical application for hæmorrhoids. A drachm of the *Tinctura Hamamelidis* in three ounces of cold water may be injected into the bowel before rising from bed in the morning ; and an ointment of one part hamamelidis to ten parts of benzoated lard will make a good ointment for piles.

HYDRASTIS. (*Golden Seal, U.S.*)

In the atonic dyspepsia of gout, particularly where there has been a free use of alcohol, the tincture of hydrastis gives tone to the stomach. It also promotes the peristaltic action of the intestines, and is useful in constipation.

Dose of *Tinctura Hydrastis*, ℥ss.-℥j.

HYDROGENIUM PEROXIDUM.

Ozonic ether is worth a trial in the albuminuria of gout if *Fuchsine* (which see, p. 287) should fail.

Dose:—℥ss.-℥j. in syrup.

HYOSCYAMUS. (*Hyoscyami Folia*.)

Henbane is said to resemble belladonna, but the difference in its properties is not simply one of degree, but of character. Practically, it is a sedative of certain of the peripheral nerves only. In so far as

it affects the centres at all its action is not sedative. When hyoscyamus produces sleep, which it rarely does, it excites rather than soothes the imaginative faculties, and gives rise to spectacular and generally monstrous dreams. I do not think it is of much value alone, so far as the cerebrum is concerned, but with conium and lupulus it sometimes soothes. Its chief use, however, is as a sedative to the peripheral nerves in the urinary passages. For the slighter forms of spasm in the urethra it is useful, and I think it is of use also in some cases of gouty nephralgia.

Dose of the Tinctura Hyoscyami, ℥x.-xl., or ℥j. The dose of the *Succus* is similar.

Tinct. Hyoscyam., F. 69, p. 222.

Succus Hyoscyam., F. 12, p. 194.

HYPOPHOSPHITES.

In prolonged debility after attacks of gout, especially at the outset of the disease, the hypophosphites are sometimes useful. I have from time to time prescribed them freely, but with very varied results. The potassii hypophosphis is the best salt to use in this malady.

Dose of the Potassii Hypophosphis, gr. j.-v.

IODUM.

Iodine is, I believe, one of the most potent remedies available, if not the nearest approach to a specific, in the treatment of the uric acid diathesis, and therefore of gout and lithiasis. It probably decomposes the urate of sodium. Under its influence, in even moderate doses, the uric acid is discharged as a "cayenne pepper" deposit, the quantity of urine passed is increased, and the proportion of urea generally rises with great rapidity. This drug will, unless I am greatly mistaken, be at no distant period recognized as *the* remedy for gout, gravel, and stone. The best form for administration is, in my experience, the tincture, which can be carefully controlled and well guarded, so far as the stomach is concerned, with glycerine. The iodides of potassium and ammonium are too depressing in their effects, the former especially.

Dose of the Tinctura Iodi, ℥v.-xv. I rarely give more than ten. It is better to repeat the dose than to increase it. Of the *Potassium Iodidum*, gr. ij.-x., or in nervous tissue sclerosis, gr. xx.-xxx. Of

the *Ammonium Iodidum*, gr. iij.-x., or in syphilis, gr. xx. The ammonium iodide is believed to be less depressing than the potassium iodide, and it has been recommended for rheumatism.

Tinct. Iodi, F. 4, p. 192 ; 20, p. 203.

Potass. Iodid., F. 21, p. 203.

Ammon. Iodid., F. 149, p. 248.

IRIDIN. (*Extractive of Iris Versicolor, Blue Flag.*)

A laxative which has also the credit of being a cholagogue. Deserves more extended trial, but certainly seems useful in a fairly large proportion of instances, given with euonymin.

Dose :—gr. j.-v., in a pill with glycerine of tragacanth.

Iridin, F. 36, p. 210 ; 89, p. 229.

LEPTANDRIN. (*Culver's Root, Leptandra Virginica.*)

A drug that deserves to be better known. In single grain doses it will often excite the gall-bladder to discharge its contents, and two or three successive doses will induce activity of the liver. It is useful in the "biliousness" of gouty subjects.

Dose :—gr. ss.-ij., in a pill, glycerine of tragacanth being the excipient. The dose should be repeated at intervals of six or eight hours until a normal state of the functions is established. This is a valuable remedy for the irritability of the bowels described at pp. 99-102—clearing away irritants and allaying disturbances.

Leptandrin, F. 88, p. 229.

LITHIUM. (*Lithiæ Carbonas, LO,CO₂, or L₂CO₃.*)

There can no longer be any question that lithium has the power of forming a soluble salt with uric acid, and that the acid has such affinity for this base that it will displace the sodium of the sodium urate. It is also certain that it *can*, under favourable conditions, break up calculi of uric acid. Taking these facts together, it will be manifest that the salts of lithium have a special claim to confidence in the treatment of gout and lithiasis. The drawback to their use is that, taken in any and every form, they are difficult of digestion.

Dose of the *Lithiæ Carbonas*, gr. iij.-vj. ; of *Liq. Lithiæ Effervesc.*, ℥v.-x. ; of *Lithiæ Citras*, gr. v.-x. ; of *Lithii Bromidum*, which is

supposed to have a power nearly double that of potassii bromidum as a hypnotic, gr. v.-xv.

Lithice Carbonas, F. 19, p. 196; 35, p. 208; 75, p. 224.

Lithice Citras, F. 48, p. 214

Lithium Bromidum, F. 34, p. 208; 110, p. 233.

LUPULUS.

The tincture is the best form in which to give hops, and in certain cases, though by no means generally, it proves useful, especially in combination with a tonic-sedative, such as cannabis. These two drugs are of great value given together when there is much mental or nervous irritability in gout. When, as not infrequently happens, there is lead-poisoning as a factor in the case, or when alcohol has been too freely taken with the result of bringing the patient to the verge of *delirium tremens*, or when there has been an abuse of morphia, particularly by the unnatural and most mischievous practice of hypodermic injection, henbane and hops go well together, and often do excellent service.

Dose of the Tincture, ℥xv.-ʒiss.

Tinct. Lupuli, F. 26, p. 205.

MAGNESIÆ CARBONAS, $(\text{MgO}, \text{CO}_2)_3 + \text{MgO} + 5\text{HO}$, or $(\text{MgCO}_3)_3 \text{MgO}5\text{H}_2\text{O}$.

Neutralizes acid and acts as an aperient. Magnesia was specially combined with colchicum for use in gout, by Sir Charles Scudamore, who announced "the most remarkable success from a draught composed of magnesiæ, gr. xv. ad xx.; magnes. sulphat., ʒj. ad ʒij.; aceti colchici, ʒj. ad ʒij. with any distilled water, the most agreeable, and sweetened with any pleasant syrup, or with 15 or 20 grains of extract. glycyrrhiz." Magnesia is, I think, best given as the carbonate in gout. If at any time the carbonic acid gas thrown off in the stomach should be an objection to its use in this form, either lemon juice may be added to the mixture containing it, or magnesia may be substituted. In that case I should give "Dinneford's Fluid Magnesia."

Dose of Magnes. Carb., gr. x.-xx. as an antacid; or, for its aperient action, gr. xx.-ʒj. : the dose of magnesia would be the same.

Magnesiæ Sulphas is a diuretic, in doses of gr. xx.-ʒj., if given in a dilute form ; as a purgative, ʒij.-ʒiv.

Magnes. Carb., F. 2, p. 192 ; 38, p. 212.

Magnesia, F. 69, p. 222.

Magnes. Sulph., F. 38, p. 212.

MANGANESIUM. (*Oxidum et Sulphas.*)

For gastrodynia try *Manganesii Oxidum Precipitatum*.

Dose:—gr. iij.-x.

For inactivity of the liver, with light-coloured constipated stools *Manganesii Sulphas* may be given as a liver-exciting, or perhaps rather gall-bladder emptying, laxative.

Dose:—gr. v.-x. or more, up to ʒi.

MOSCHUS. (From *Moschus Moschiferus.*)

Animal musk was first recommended for gout in the stomach by Pringle. Cullen approved of its administration. Of late years it has fallen into disuse, chiefly, I imagine, on account of its cost. There is great difficulty in procuring the genuine excretion. It is a powerful stimulant and anti-spasmodic, and will, if promptly administered, rouse the stomach to that muscular, vascular, and glandular activity which is essential at the moment of so-called metastasis, or *shock*, in which gout is likely to be localized in the gastric organ. (See Castoreum, p. 283.)

Dose:—gr. v.-x., or more up to xxx. in extreme cases.

Moschus, F. 55, 218.

NITRO-GLYCERINUM. (*Nitric Ether of Glycerine.*)

The principal use of this remedy in gout, and it is one of great value and importance, is to relax the arteries, reduce the intra-capsular pressure, and thus facilitate the action of the contracted granular kidney in advanced cases. It is also of service in certain cases of sudden congestion of the kidney by "metastasis" in retrocedent gout.

Dose:— $\frac{1}{200}$ to $\frac{1}{50}$ of a grain. The best form for administration is a one per cent. liquor nitro-glycerini, of which the Dose is ℥ss.—ij.

Liquor Nitro-glycerini, F. 124, 126, p. 236.

NUX VOMICA.

The strychnos nux vomica in the form of tincture is very useful in gout as a general and arterio-muscular tonic. It increases the contractile force of the arteries and quickens the blood-current, thus rendering deposits unlikely to occur, or likely to be taken up when thrown down or effused. It acts better than strychnia.

Dose:—*Tinctura Nucis Vomicae*, ℥v.—x.

Tinct. Nucis Vom., F. 20, p. 203; 25, p. 204; 26, p. 205; 72, p. 224; 78, p. 226; 81, 82, p. 227.

PARALDEHYDUM. (*Paraldehyde.*)

This soporific is more effective than chloral, which it resembles in action, and ought to replace. For use in gout it is especially suitable because it has diuretic properties. It would seem that these may be due to an inhibitory influence exerted on that special part of the vaso-motor centre which regulates the calibre of the renal arteries; or the effect *may* be produced by irritation of the polyuric centre; this last explanation, however, appears unsatisfactory. Paraldehyde does not generally exert any influence on the skin, though I have seen it cause profuse perspiration in weakly subjects. It does not enfeeble the heart's action, but it reduces its frequency. It is therefore a good sedative-diuretic.

Dose:—℥xv.—xxx. or l.

Paraldehydum, F. 115, p. 234.

PICROTOXINUM. (From *Menispermum Cocculus.*)

May be employed in cases of epileptic or epileptiform disturbance, which very often occur at night in gouty subjects, either before the disease is thoroughly developed or in the intervals between attacks. It is also useful in the highly excitable states consequent on excessive uses of stimulants by the gouty.

Dose of Liquor Picrotoxini Aceticus, ℥ij.—x. ℥j. = $\frac{1}{240}$ of a grain.

PISCIDIA. (*Bark of Jamaica Dogwood, Piscidia Erythrina.*)

Useful as an anodyne. It also sometimes induces quiet which ends in sleep. I have found it very uncertain, but, on the whole, it has produced good results.

Dose of Extractum Piscidiae Erythrinae Fluidum, ℥x.—ʒj., or more.

Extract. Piscid. Erythr. Fl., F. 114, p. 233.

PODOPHYLLIN. (From root of *Podophyllum Peltatum*.)

I do not place much reliance on this so-called "cholagogue and aperient," because its effects are extremely uncertain. I am disposed to prescribe in its place *Podophyllotoxin*, the dose of which is $\frac{1}{10}$ to $\frac{1}{8}$ of a grain. A solution of known strength may be made with alcohol to subdivide the dose.

Dose of Podophyllin, gr. $\frac{1}{4}$ -j.; *Podophyllotoxin*, $\frac{1}{10}$ to $\frac{1}{8}$ of a grain.

POTASSÆ ACETAS, $\text{KO},\text{C}_4\text{H}_3\text{O}_3$, or $\text{KC}_2\text{H}_3\text{O}_2$.

This salt loses its acetic acid in the blood and appears in the urine as a carbonate, rendering that fluid alkaline, but it does not greatly increase the quantity of water thrown out by the kidney. It has the power of keeping the uric acid in solution in the urine, but it is not certain whether it increases the solvent power of the blood.

Dose:—gr. x.-lx. In larger doses than this it irritates the intestines and stimulates the peristaltic action to catharsis.

Pot. Acet., F. 3, p. 192; 12, p. 194; 33, p. 208; 44, p. 213; 59, p. 219; 64, p. 221.

POTASSÆ BICARBONATIS, $\text{KO},\text{HO},2\text{CO}_2$, or KHCO_3 .

Renders the urine alkaline, and probably reduces the acidity of the fluids in the body generally, thus tending to prevent the deposit of uric acid. Its drawback is that, being introduced into the stomach as an alkaline carbonate, it neutralizes the acid of the gastric juice. While, therefore, food is being taken and the digestive function has to be performed, it is better to give the citrate (which see).

Dose:—gr. x.- $\bar{5}$ j., according to the frequency of the administration. Full doses are required when the urine is very acid.

Pot. Bicarb., F. 1, p. 192; 46, p. 213; 62, p. 220.

POTASSÆ CHLORAS, KO,ClO_3 , or KClO_3 .

Said to pass through the organism unaltered, not parting with any of its oxygen. I doubt if this be true when it is given with glycerine as in F. 4, p. 192. However that may be, the chlorate of potash certainly stimulates the kidney to activity, and has other effects, as in ulcerations of the throat, and diphtheritic states which are common in gout. It is far from inert. There have from time to time

been allegations that potassæ chloras irritates and even inflames the kidney. I think these charges are groundless, unless the quantity given be extremely large.

Dose:—gr. x.—xx.

Pot. Chlor., F. 4, p. 192.

POTASSÆ CITRATIS, $3\text{K}_2\text{O}, \text{C}_{12}\text{H}_5\text{O}_{11}$, or $\text{K}_3\text{C}_6\text{H}_5\text{O}_7$.

Does not neutralize the acid of the stomach, but, parting with its citric acid in the blood, renders the urine alkaline, appearing as a carbonate. It is therefore to be preferred to the other salts when food is being taken and the stomach is required to perform its functions. The diuretic action is slight.

Dose:—gr. xx.—ʒj. ; but I often give ʒij. or more at short intervals for several days in succession, with a view to render the fluids alkaline, or at least neutralize their acidity, as quickly as possible. It never disagrees.

Pot. Citr., F. 10, 11, p. 194 ; 27, p. 205 ; 45, 47, p. 213 ; 48, p. 214 ; 63, 66, p. 221.

POTASSÆ NITRAS, KONO_3 , or KNO_3 .

Produces a discharge of fluid from the blood. This is determined to the kidney or to the skin by other drugs or the surrounding conditions of temperature, &c. It is valuable by relieving blood-pressure or tension, and, *in this way*, acts as a sedative of the cardiac excitation in febrile states. Very much of the excess of force and rapidity in the heart's action in febrile states is due to the obstacle it encounters in propelling the blood, owing to the contraction of the arterioles ; the escape of fluid favoured by this salt reduces the tension.

Dose:—gr. v.—xx. or xxx.

Pot. Nitr., F. 46, p. 213 ; 62, p. 220.

POTASSÆ SULPHAS, KO_2SO_3 , or K_2SO_4 .

Aperient, but acts well on the kidney, slightly stimulating its function. Not very commonly used, but serviceable.

Dose:—gr. xx.—ʒj. or ʒij. as laxative, gr. x.—xx. for its general effects and action on the kidney. It cannot, however, be classed as a diuretic.

Pot. Sulph., F. 43, p. 212.

POTASSÆ TARTRAS ACIDA, $\text{KO}, \text{HO}, \text{C}_8\text{H}_4\text{O}_{10}$, or $\text{KHC}_4\text{H}_4\text{O}_6$.

Valuable for its acid properties. (See p. 200.) It is diuretic in moderate, and purgative in large, doses. It relieves too great blood-pressure quickly by producing an outpouring of fluid, which in gout should be determined to the kidneys by giving the acid tartrate of potash with vegetable diuretics.

Dose:—gr. xx.—ʒj. In ʒij. or ʒiij. doses it acts as an aperient, with considerable discharge of fluid into the intestines.

Pot. Tartr. Acid., F. 39, 42, p. 212.

PRUNUS VIRGINIANA. (*Wild Cherry Bark, U.S.*)

This is a most valuable addition to our list of drugs. It is a tonic-sedative, and useful in the treatment of gouty bronchitis, and asthma with cough. It also answers the purpose of an adjunct to mixtures which might otherwise prove irritating to the stomach.

Dose of the Syrup, ʒj.

Syrupus Pruni Virginianæ, F. 74, p. 224.

PULSATILLA. (*Pulsatilla Nigricans.*)

An important sedative for reflex excitability, particularly of the muscular fibres of the bronchial tubes and of the mucous membranes lining the air-passages generally. It seems to act well in all cases where excitations are awakened or propagated reflexly or through the sympathetic system. In coughs occurring in gouty subjects it is most useful.

Dose of the Tincture, ʒj.—v.

Tinctura Pulsatillæ, F. 101, 102, p. 231.

SALICINUM. (*From Salicis Cortex.*)

The active principle of the willow-bark, first obtained by M. Leroux, who recognized its febrifuge properties. (See p. 214.) To be preferred to salicylic acid, which is *not* prepared from salicis cortex, but by a factitious process from carbolic acid. Salicin is undoubtedly a powerful febrifuge in acute rheumatism. During the administration of salicin the urine should be tested with a persalt of iron for salicylic acid. It will strike a purple colour if the acid is being eliminated properly. (See Acidum Salicylicum, p. 277.)

Dose:—gr. v.—xxx.

Salicinum, F. 49, p. 214.

SCOPARII CACUMINA. (*Brough Tops.*)

Contains *Scoparine* ($C_{21}H_{22}O_{10}$) and *Sparteia* ($C_{15}H_{26}N_2$).

This is one of the most effective of the diuretics. Its action has been supposed to be simply irritative, but there is reason to think that this impression is due to the way in which it has been used. The active principle has properties similar to conia or nicotine, which, although in excess toxic, in moderate doses produce an outflow of fluid from the kidney by inhibiting the vaso-motor contraction of the arterioles supplying the vessels of the glomeruli. It is therefore, in my opinion, a diuretic particularly suitable in gout, enabling the kidneys to be "flushed," and the tubes rapidly cleared of uric acid crystals and urates. The quantities of the drug taken should be moderate, and it ought to be used only as an adjunct to other remedies.

Dose of the Decoctum Scoparii, ʒj.-ʒij.; of the *Succus Scoparii*, ʒj.-ʒij., not more.

Dec. Scopar., F. 3, p. 192; 5, p. 193.

Succ. Scopar., F. 12, p. 194.

SENEGÆ. (*Radix.*)

Senega root is an excellent stimulant to the mucous surfaces, whether of the lung or the bladder; and it appears to possess some influence over the reflex excitability of the nerves supplying the muscular fibres of the heart, the bronchi, and the blood-vessels. It answers well in irritability of the cardiac muscle, as a whole, in spasmodic forms of bronchitis, and bronchial catarrh, and in torpid or irritable states of the bladder. I question whether it has any diuretic power, properly so-called, but it helps the bladder, and perhaps the ureter, to empty itself quickly.

Dose of the Tinctura Senegæ, ʒss.-ʒij.; of the *Infusum Senegæ*, ʒj.-ʒij.

Infusum Senegæ, F. 65, p. 221.

Tinctura Senegæ, F. 21, p. 203.

SERPENTARIA. (*Radix.*)

Beyond question serpentary root is a drug of very high value in gout. Whether it be true that it acts as a stimulant to the circulatory system, or if it be as an excitant to the absorbents, it produces

the good results that follow its use cannot at present be determined, but clinical experience goes to show that, under the continued administration of serpentary, gouty obstructions are gradually removed, and organs and parts which have long been thickened and inactive slowly but steadily regain their power or become mobile.

Dose of the *Tinctura Serpentariæ*, ʒss.-ʒij. ; of the *Infusum Serpentariæ*, ʒj.-ʒij.

Infusum Serpentariæ, F. 7, 9, p. 193 ; 11, p. 194 ; 21, p. 203 ; 25, p. 204 ; 31, 32, p. 207 ; 35, p. 208 ; 64, 67, p. 221.

Tincturæ Serpentariæ, F. 3, p. 192 ; 31, p. 207 ; 58, p. 219 ; 64, 67, p. 221.

SODÆ ARSENIAS.

This preparation of arsenic is the mildest and most manageable, and very effective as an alterative in the treatment of gouty women who suffer greatly from nervous affections. (See p. 18.) Arsenic is undoubtedly the most potent drug in these cases, and it is of high value in gastric irritation generally. The administration should always be carefully supervised, and the dose reduced or its exhibition suspended for a time, if there be either heat and pricking in the eyes, or diarrhœa, with mucous or "spinach" stools.

Dose of *Liquor Sodæ Arseniatis*, ʒv.-x. Five minim doses generally suffice.

Liquor Sodæ Arseniatis, F. 74, p. 224.

SODII BENZOAS.

This benzoate is not readily decomposed, but appears in the urine as a hippurate. It is a solvent of uric acid, and unquestionably proves of the greatest service in gout. The formation of hippuric acid under the influence of the benzoates seems to liberate a portion of the products of disassimilation in the form of hippuric acid or hippurates, while the quantity of uric acid excreted is not diminished, but rather increased. Sodium benzoate is probably the best form in which to give benzoic acid in gout. The salt is anti-pyretic in large doses, and it is also a stimulant of liver-function. In acute and chronic gout, and in rheumatism, it is valuable ; also in lithiasis. (See p. 51.)

Dose:—gr. x.-xxx. or more progressively.

Sodii Benz., F. 8, p. 193 ; 31, p. 207 ; 47, p. 213 ; 57, p. 219 ; 68, p. 222 ; 75, p. 224.

SODÆ CARBONATIS, $\text{NaO}, \text{CO}_2 + 10\text{HO}$, or $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$.

There is great difference of opinion as to the relative value of soda and potassa as bases. The potash salts are certainly more easily broken up than the soda, and on that account the former have been preferred. It would, however, seem that there is a reaction commencing in favour of soda. The potash salts are undoubtedly more active as regards the kidney function; but soda is supposed to act more powerfully on the liver. This difference may to some extent govern the choice between them in gout.

Dose:—gr. x.—xxx.

Sodæ Carb., F. 42, p. 212.

Sodæ Bicarb., $\text{NaO}, \text{HO}, 2\text{CO}_2$, or NaHCO_3 (milder on account of the additional carbonic acid).

SODÆ PHOSPHAS, $2\text{NaO}, \text{HO}, \text{PO}_5 + 24\text{HO}$ or $\text{Na}_2\text{HPO}_4 \cdot 12\text{H}_2\text{O}$.

The old "tasteless salts." Aperient in full, diuretic in small, doses. It has also a special value as regards the uric acid in gout, rendering the urine alkaline, and probably affecting the blood and other fluids of the body in the same way.

Dose:—ʒij.—ʒj. aperient; ʒss.—ʒij. diuretic if given in a dilute form, the skin being kept somewhat cool. As an aperient it may be given in mutton-broth, and is then almost tasteless.

Sodæ Phosph., F. 15, p. 195; 37, p. 212; 60, p. 219.

SODA TARTARATA, $\text{NaO}, \text{KO}, \text{C}_8\text{H}_4\text{O}_{10} + 8\text{HO}$, or $\text{NaKC}_4\text{H}_4\text{O}_6, 4\text{H}_2\text{O}$. (*Tartrate of Soda and Potash.*)

Aperient, and diuretic; renders the fluids of the body alkaline.

Dose:—gr. xxx.—ʒj. diuretic, ʒij.—ʒiv. aperient.

Soda Tartar., F. 41, p. 212.

SODÆ TAUROCHOLAS. (*A Biliary Salt.*)

Taurocholate of soda may be obtained from the bile of the pig by evaporating to dryness, pulverizing, digesting with alcohol, throwing down the biliary salts by ether slowly added, pouring off the ether after the deposit has settled, dissolving the latter in distilled water, and adding acetate of lead carefully, to throw down nearly all, *but not quite all*, the glycocholate. Then decant the fluid which retains the taurocholate of soda in solution, and, after testing to be sure that there is no lead in the solution, evaporate to the proper consistency for making into pills. Let the pills contain 3 or 4 grs. of taurocholate of soda, and coat with two layers of keratin. Keratin

may be made from horn shavings, by digesting in ether and boiling the residue in solution of caustic potassa. With this keratin the pills may be coated *so as not to dissolve in the stomach*. One or two should be given with each meal or immediately after food. One of the earliest, if not a primary, error of function in gout is failure of the liver to secrete sufficient, or normally constituted, bile. The product of liver function is, as we know, excremento-recremental, the greater part of the bile being re-absorbed in the intestines; and among other uses in the economy, such as helping to hold the cholesterine, *and perhaps the uric acid*, in solution, it is destined to facilitate the proper digestion and assimilation of fats. If fat be not duly assimilated, it will be deposited crudely, in the abdominal parietes, the omentum and elsewhere, with the result of obesity, coupled with deficiency of heat production and maintenance; which is a very different thing from obesity with full or even excessive powers of calorification. I think it is important to make this discrimination between two distinct and totally different classes of cases. In the former class—common in persons with an inheritance of gout, in which there is obesity with a low grade of heat-force—I am giving the taurocholate of soda in the form of a pill, to be taken as pepsine is taken, with food. The results are very striking. The stools are rendered characteristically rich in bile without purging, the food is readily digested, and the accumulations of fat seem to melt slowly away.

Dose:—gr. iij.-vj., or more.

Sodæ Taurocholas, F. 23, p. 204; 70, p. 223.

SODÆ VALERIANAS, $\text{NaO}, \text{C}_{10}\text{H}_9\text{O}_3$, or $\text{NaC}_5\text{H}_9\text{O}_2$.

Is not much known as a drug; being used chiefly in the preparation of the other valerianates. I have, however, found it most useful in gout. Whether the hydrochloric acid of the gastric juice decomposes the salt, and the valerianic acid being set free in the stomach is absorbed as such, I do not know, but the therapeutic value of sodæ valerianas seems *practically* to be decidedly greater than that of the other salts. It relieves the nervous troubles in gout effectively, and I cannot help thinking it promotes, doubtless through the nervous system, activity of the absorbents, thereby tending to remove obstructions, whether caused by congestion, effusion, or old concretions.

Dose:—gr. j.-v.; I usually give three or four grains.

Sodæ Valer., F. 7, p. 193; 67, p. 221.

SODII HIPPURAS.

Resembles sodium benzoas in its action ; may be given alternatively or with the benzoate. The introduction of a hippurate into the system seems to act by catalysis in producing hippurates in the urine. These hippurates in some degree, perhaps, replace uric acid. (See p. 51.)

Dose :—gr. v.—xxx.

Sodii Hippur., F. 10, p. 194 ; 32, p. 207 ; 58, p. 219.

SODII IODIDUM.

To be preferred, I think, to potassii iodidum in gout, being less depressing in its effects. Used in similar cases.

Dose :—gr. ij.—xx.

Sodii Iodidum, F. 141, p. 246 ; 148, p. 248 ; 151, p. 249.

SODII NITRIS.

Of value in the epileptiform disturbances which occasionally occur in neurotic subjects, or young and middle-aged persons who have had convulsions in early childhood. At certain epochs the liability to develop epilepsy seems to be considerable in these cases. The attacks either take place at night and are eclampsic, or, if they occur by day, they take the form of *petit mal* generally preceded by a sort of aura rising from the feet, and passing up either the side or back of the legs. These attacks, which in females are often complicated with hysterical and cataleptic symptoms, cease when gout is either developed or relieved.

Dose :—gr. ij.—v.

Sodii Nitris, F. 128, p. 237.

SODII SALICYLAS.

If it be desired to give salicylic acid, this is the best form.

Dose :—gr. x.—xxx.

Sodii Salicylas, F. 50, p. 214 ; 142, p. 247.

SODII SULPHOCARBOLAS.

Useful in flatulency from the generation of gas in the stomach during digestion, when the food is detained in that organ from want of tone in its muscular fibres, with or without dilatation. The sulpho-

carbolate of sodium combines in a mild form the antiseptic properties of carbolic acid with the sedative action of a minute dose of sulphuretted hydrogen generated in the stomach.

Dose:—gr. v.—xv., much diluted, and always taken with food, or close upon it.

Sodii Sulphocarb., F. 18, p. 195.

SPIRITUS JUNIPERI and JUNIPERI OLEUM.

Juniper is an old-fashioned and trusty diuretic. It favours the elimination of urea and the urates without causing a great drain of fluid, and is, therefore, not to be discarded as an adjunct in the treatment of gout. When the uric acid is to be evacuated from the blood, rather than the kidney to be flushed, juniper is appropriate.

Dose of the Oil, ℥ij.—x.; of the Spirit (which is generally to be preferred), ℥xxx.—ʒj.

TRIMETHYLAMINA. (*Secalin.*)

(Prepared from herring brine and stale fish by distillation with lime.) This is an active drug in rheumatic gout, and deserves to be more extensively used. It is a sedative of the heart's action, and at the same time reduces the muscular tension of the coats of the arteries, which must be distinguished from tension of the blood current. A rigid, full pulse with a flat-headed tracing would indicate a trial of this remedy.

Dose of the *Hydrochlorate*, gr. ij.—iij. three or four times daily.

Trimethylaminæ Hydrochloras, F. 51, 52, p. 215.

VERATRI VIRIDIS RADIX.

With due care this drug may be used in the same class of cases as aconite. It is a cardiac-sedative. In acute rheumatic gout it is sometimes of value.

Dose of the Tincture, ℥v.—xx., watching the effect and stopping the medicine when the pulse becomes even *slightly* less hard, or if any symptom of depression set in. Cases in which either aconite or veratrum are given always require very close watching.

Tinctura Veratri Viridis, F. 97, p. 230.

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